

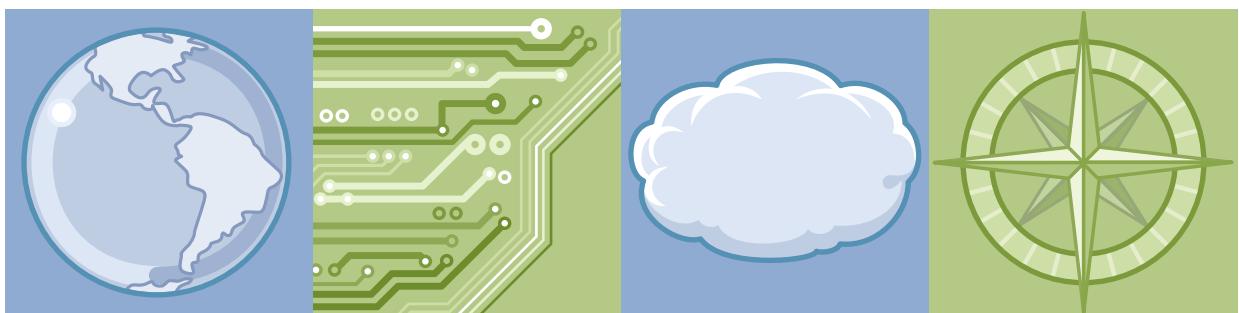


IBM Training

Student Exercises

Administering IBM Operational Decision Manager V8.7.1

Course code WB393 / ZB393 ERC 1.0



WebSphere Education

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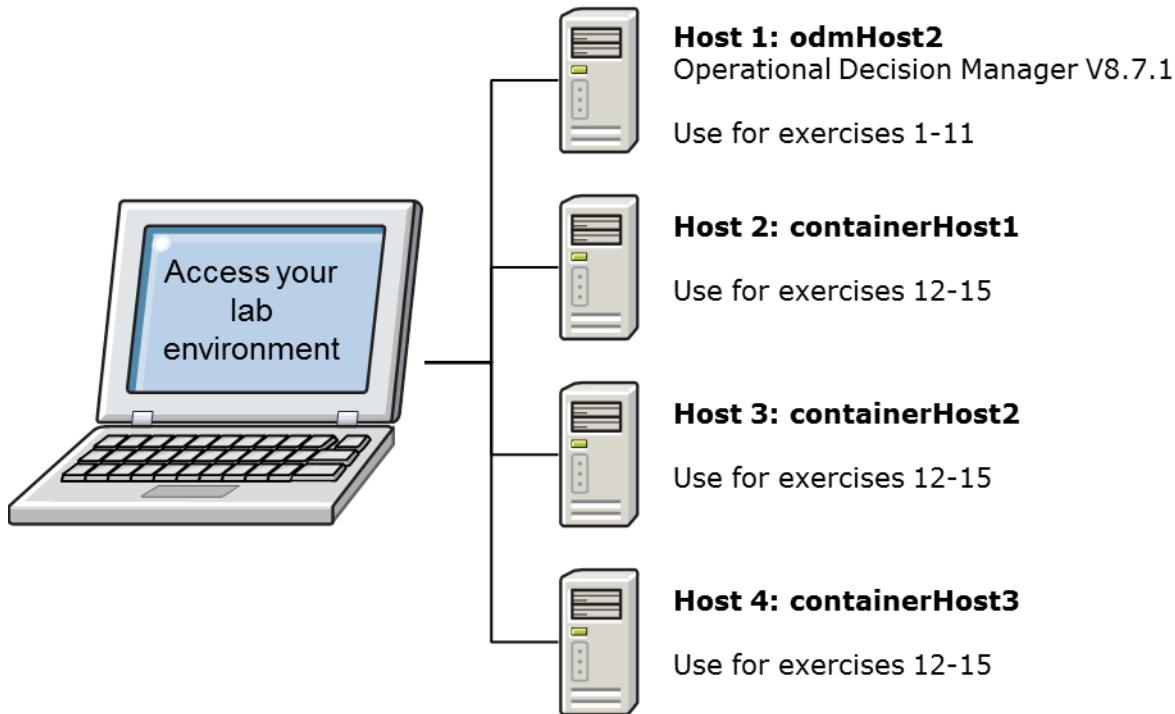
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Exercises configuration

Environment

This course requires that you use four computers or virtual machines that are on the same network.

During the first part of the course, you work on one machine. For the final part of the course, you work with all the hosts to simulate a production topology.



For this course, four virtual machines are provided. The default host names are:

- odmHost1
- containerHost1
- containerHost2
- containerHost3

For the first exercises, you do not switch from one host to another. However, starting with exercise 12, you might want to take note of the IP addresses for each host to help you navigate between hosts.

For your reference, use Appendix B, "Host names and IP addresses," on page B-1 to keep track of the IP addresses that are assigned to your hosts and the actual host names.



Warning

The exercise instructions assume that your machines use the default host names. However, if you are in a classroom setting with multiple sets of hosts for students, your hosts might be renamed to other unique host names.

Make sure that you know the host names of the virtual images that you are using and that you use the ***actual*** host names during the exercises.

Exercises description

This course includes the following exercises:

- Exercise 1, "Exploring the Operational Decision Manager installation"
- Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server"
- Exercise 3, "Configuring Decision Center on WebSphere Application Server"
- Exercise 4, "Using a profile template to configure Rule Execution Server"
- Exercise 5, "Customizing user access and enforcing security in Decision Center"
- Exercise 6, "Synchronizing across business and development environments"
- Exercise 7, "Managing deployment"
- Exercise 8, "Exploring the Rule Execution Server console"
- Exercise 9, "Auditing ruleset execution through Decision Warehouse"
- Exercise 10, "Monitoring rule execution and performance"
- Exercise 11, "Managing baselines and multiple releases"
- Exercise 12, "Installing Decision Server Insights"
- Exercise 13, "Configuring Decision Server Insights"
- Exercise 14, "Managing deployment and connectivity"
- Exercise 15, "Administering Decision Server Insights"

Exercise objectives

After completing the exercises, you should be able to:

- Configure the ODM modules on WebSphere Application Server
- Set up custom groups and enforce security in Decision Center
- Synchronize rule projects between Rule Designer and Decision Center
- Package and deploy rule artifacts and the XOM to a managed execution environment in Rule Execution Server
- Manage ruleset deployment
- Use the RuleApp and ruleset management functions of the Rule Execution Server console
- Audit, monitor ruleset execution through Decision Warehouse
- Manage logging, troubleshoot configuration issues, and improve Rule Execution Server performance
- Work with Decision Center version control, baselines, and multiple release management features
- Install Decision Server Insights on multiple hosts

- Create and configure catalog, container, and inbound and outbound servers
- Manage security and deployment across the grid
- Configure and deploy inbound and outbound connectivity
- Monitor and manage grid hosts

The first exercise introduces you to the installation of Operational Decision Manager components for business rules and events, including Decision Server Rules and Decision Center. Next, you walk through the manual configuration of the ODM modules on WebSphere Application Server.

Exercise 2 through to Exercise 11 concentrate on administrative tasks for Decision Server Rules and Decision Center.

Exercises 12 through to 15 focus on Decision Server Insights.

Working on the exercises

Some of the exercises can be done independently and do not depend on completion of a previous exercise. However, most of the exercises build on each other and should be completed in the order in which they are presented.

For example, students should complete Exercises 1, 2, 3, and 4 in sequence.

The following exercises involve rule deployment and execution and should be done in sequence:

- Exercise 7, "Managing deployment"
- Exercise 8, "Exploring the Rule Execution Server console"
- Exercise 9, "Auditing ruleset execution through Decision Warehouse"
- Exercise 10, "Monitoring rule execution and performance"

The following exercises cover the configuration and administration of Decision Server Insights and should be done in sequence:

- Exercise 12, "Installing Decision Server Insights"
- Exercise 13, "Configuring Decision Server Insights"
- Exercise 14, "Managing deployment and connectivity"
- Exercise 15, "Administering Decision Server Insights"

General exercise information

This section provides general information about the exercises in this course. Review this section before starting the exercises.



Important

The exercises in this course use a set of lab files that might include scripts, applications, files, solution files, and others. The course lab files can be found in the following directory:

C:\labfiles for the Windows platform

/usr/labfiles for the Linux platform

The exercises point you to the lab files when you need them.

User IDs and passwords

Here is a list of user ID and password information for this course.

Entry point	User ID	Password
VMware image	administrator	web1sphere
Windows 2008 R2	administrator	web1sphere
Single-sign-on ID for ODM installation and user ID for WebSphere Application Server and Decision Server	odm	odm
Decision Center administrator	rtsAdmin	rtsAdmin
Decision Center configuration user	rtsConfig	rtsConfig
Decision Center business user	rtsUser1	rtsUser1
Decision Server administrator	resAdmin	resAdmin
ODM administrator user for the lab exercises	odmAdmin_lab	odmAdmin_lab
Rule Execution Server administrator for the lab exercises	resAdmin_lab	resAdmin_lab
Decision Server Insights administrator for the lab exercises	admin	ins1ghts

How to follow the exercise instructions

Structure of exercise steps

Each exercise is divided into sections with a series of numbered steps and lettered substeps:

- The numbered steps (1, 2, 3) represent actions to be done.
- The lettered substeps (a, b, c) provide detailed guidance on how to complete the action.



Information

If you already understand how to do the action in the numbered step, you can skip the specific guidance in the lettered substeps.

Here is an example from this exercise.



Example

Excerpt from Exercise 1

- 1. Test that your variables are set correctly.
 - a. Open a command prompt window and type: ant -version
 - b. Press Enter.

You should see the message:

Apache Ant version 1.7.1 compiled on June 27 2008

In this example, the numbered step is used to test the variables to confirm that they are correct. The “a” and “b” substeps provide specific guidance on how to confirm that variables are set correctly.

Text highlighting in exercises

Different text styles indicate various elements in the exercises.

Words that are highlighted in **bold** represent GUI items that you interact with, such as:

- Menu items
- Field names
- Icons
- Button names

Words that are highlighted with a `fixed font` include the following items:

- Text that you type or enter as a value
- System messages
- Directory paths
- Code

Tracking your progress

As shown in the example step, you can see that an underscore precedes each numbered step and lettered substep.

You are encouraged to use these markers to track your progress by checking off each step as you complete it. Tracking your progress in this manner might be useful if you are interrupted while working on an exercise.

Required exercise sections

Most exercises include required sections that should always be completed. It might be necessary to complete these sections before you can start subsequent exercises.

Dependencies between exercises are listed in the exercise introduction.

Optional exercise sections

Some exercises might also include optional sections that you can complete if you have sufficient time and want an extra challenge.

File references

Exercise steps contain references to files or projects to open or import. Two directories are used in these references:

- <*InstallDir*>: This directory is the installation directory for IBM Operational Decision Manager and IBM WebSphere Application Server.
- <*TrainingDir*>: This directory contains the files that are required during demonstrations, exercises, and the workshop steps, such as samples of code that you can copy and paste.



Information

If you are using the VMware images that are provided with this course:

- <*InstallDir*> is: C:\Program Files\IBM\ODM871
- This folder is the default IBM Operational Decision Manager installation directory on Windows.
- <*TrainingDir*> is: C:\labfiles

If you are not using the VMware images that are provided with this course:

- Ask the installer of your environment, or your instructor, where to find the <*InstallDir*> and <*TrainingDir*> directories.



Stop

Make sure that you identify the <*InstallDir*> and <*TrainingDir*> directories before you proceed with the exercises in this course.

Ports

This course uses the default installation of Operational Decision Manager where ODM modules, such as Decision Center and Rule Execution Server, are hosted on the sample server of Operational Decision Manager.

With that default installation, you access the console of each of these modules with a web browser. For example, you can open these consoles without going to the Start menu by typing these URLs in a browser:

- `http://localhost:PORT/teamserver` to access the Decision Center Enterprise console
- `http://localhost:PORT/res` to access the Rule Execution Server console

The `PORT` value must use the correct port for your installation. Port numbers vary depending on your installation and the WebSphere Application Server profile that you use.



Important

If you are using the VMware images that are provided with this course:

- The value of `Port` for the ODM sample server is: **9080**

This value is the default port with the default installation of Operational Decision Manager and the default sample server profile.

If you are not using the VMware images that are provided with this course, or if you are working with a different profile:

Complete the following steps to find the value of `PORT`:

1. Open Windows Explorer and go to:

`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\Profile_Name\logs`

For example, to find the `ODMSample8710` profile, go to the following directory:

`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8710\logs`

2. Open `AboutThisProfile.txt` with any text editor.
3. Read the value of `PORT` at the end of the line that starts with:

HTTP transport port:



Stop

If you are not using the VMware images that are provided with this course, make sure that you identify the value of `PORT` before you proceed with the exercises in this course.

Using the product documentation

The product documentation is installed locally on the VMware image that is provided with this course, and the documentation is updated and initialized.

To access the local documentation while working in Rule Designer, you must first start it by clicking: **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Help and Support > Start Information Center (local)**.

If you have Internet access, you can also view the product documentation by going to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > IBM Knowledge Center** or by entering this web address into a web browser:

http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/welcome/kc_welcome_odmV.html



Information

If you are not using the VMware image that is provided with this course, you might need to initialize the local help before you can view it. The initialization process requires Internet access.

Alternatively, if you have Internet access, you can also view the online IBM Knowledge Center for Operational Decision Manager.



Important

For classes that are delivered by using the IBM Remote Lab Platform (IRLP) in Montpellier, France:

- To log on to the lab virtual machine image, use the administrator ID and password `websphere`, and then follow the instructions.
- Refer to the `readme.txt` file on the lab image desktop for possible additional information.
- Online course material updates might exist for this course. To check for updates, see the IBM Systems Middleware Education wiki at:
www.ibm.com/developerworks/connect/middleware_edu

Exercise 1. Exploring the Operational Decision Manager installation

What this exercise is about

In this exercise, you explore the installed ODM modules through IBM Installation Manager and learn how to modify the installed software packages.

What you should be able to do

After completing this exercise, you should be able to:

- Describe the Operational Decision Manager installation
- Modify installed software packages

Introduction

IBM Operational Decision Manager (ODM) was already installed on your class image by using IBM Installation Manager. In this exercise, you explore the installed modules.

In the first part of this exercise, you explore how to use IBM Installation Manager. In the second part of this exercise, you learn how to modify the installed software packages.

This exercise includes these sections:

- Section 1, "Checking for course corrections and note on lab files"
- Section 2, "Exploring your ODM installation through IBM Installation Manager"
- Section 3, "Modifying the installed software packages"
- Section 4, "Verifying the contents of your installation"
- Section 5, "Setting up your environment variables"

Requirements

If you are not using the VMware image that is provided with this course, make sure that Operational Decision Manager is installed in your environment through IBM Installation Manager.

Section 1. Checking for course corrections and note on lab files



Stop

Course updates and corrections



A Course Corrections document might be available for this course.

If you are taking the class with an instructor, the instructor can provide this document to you.

Information

If you are taking the course in a self-paced environment, the course corrections document is provided with the other manuals.

To check whether a Course Corrections document exists for this course:

1. Go to the following URL: http://www.ibm.com/developerworks/connect/middleware_edu
2. On the web page, locate and click the **Course Information** category.
3. Find your course in the list and click the link.
4. Click the **Attachments** tab to see whether an errata document exists with updated instructions.
5. To save the file to your computer, click the document link and follow the dialog box prompts.



Important

The exercises in this course use a set of lab files that might include scripts, applications, files, solution files, PI files, and others. The course lab files can be found in the following directory:

- C:\labfiles for the Windows platform
- /usr/labfiles for the Linux platform

The exercises point you to the lab files when you need them.

Section 2. Exploring your ODM installation through IBM Installation Manager

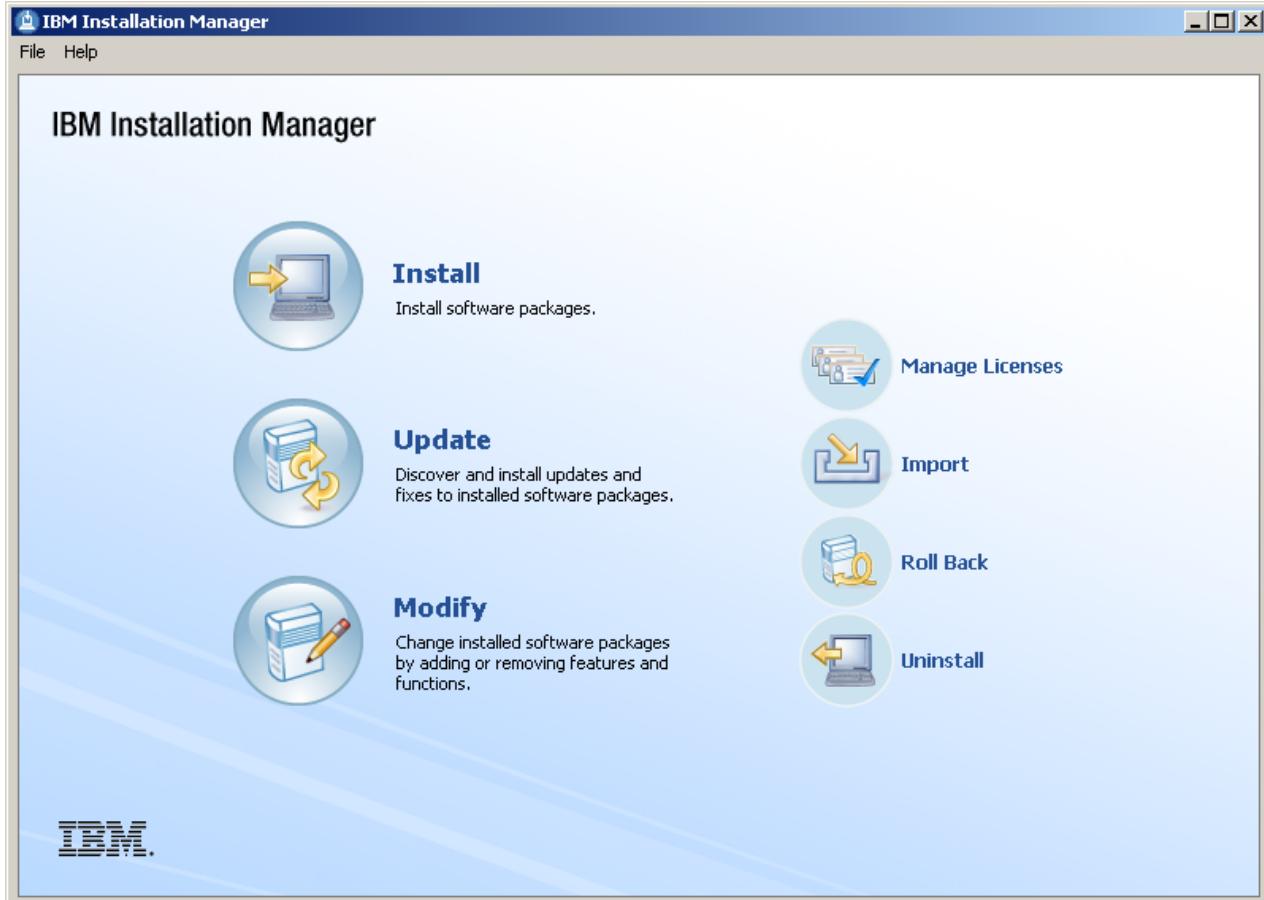
You can use Installation Manager when you want to install only a subset of ODM. In Installation Manager, you can also customize your installation for specific configurations.

To install the ODM packages, Installation Manager must access the repositories that contain the packages to install. When you install by using the product launchpad, Installation Manager already knows the repositories to use to install the product. However, if you are not using the launchpad, you must specify in Installation Manager, the repository URLs for Decision Center and Decision Server.

2.1. Starting the IBM Installation Manager

- 1. Start the IBM Installation Manager.
 - a. Click **Start > All Programs > IBM Installation Manager > IBM Installation Manager**.

IBM Installation Manager opens, and you see the installation options that are available.



- 2. View the Install option.
 - a. Click **Install**.
 - b. If you see a warning open with a message that the repositories are not connected, click **OK** to close the warning.

Installation Manager maintains a connection to the source location for the installation files. When you attempt to open the installation, this warning occurs when the connection is lost.

When the repositories are connected, you can use the **Install** option to install software packages and to see what is already installed.



Information

This screen capture shows an example of the Install Packages window when the repository is connected to the Installation Manager. For example, notice the names of the modules and their status. The lower part of this window shows the location of the repository that was used for installation.

IBM Installation Manager

Install Packages

Select packages to install:

Installation Packages	Status	Vendor
Decision Center	Installed	
Version 8.7.1.0	Installed	IBM
Decision Center profile templates for WebSphere Application Server	Installed	
Version 8.7.1.0	Installed	IBM
Decision Server Insights	Installed	
Version 8.7.1.0	Installed	IBM
Decision Server Rules	Installed	
Version 8.7.1.0	Installed	IBM
Decision Server Rules profile templates for WebSphere Application Server	Installed	
Version 8.7.1.0	Installed	IBM
IBM WebSphere Application Server Network Deployment	Installed	
Version 8.5.5.4	Installed	IBM
IBM WebSphere SDK Java Technology Edition (Optional)	Installed	
Version 7.0.8.0	Installed	IBM

Show all versions

Details

Decision Center 8.7.1.0

An environment for business users to author, manage, and test their business rules and event rules. [More info...](#)

- Repository: C:\ODM871\disk3\//DC

[?](#)

- ___ c. In the Install Packages window, click **Cancel** to return to the main menu of Installation Manager.
- ___ 3. View the Update option.
- ___ a. Click **Update**.
- ___ b. Click **OK** to close the repository warning.

You can use the Update option to install updates and fixes to existing software packages.

In this case, notice the package group names and the installation directories. The installed packages and their directories are listed.

Package Group Name	Directory
IBM WebSphere Application Server Network Deployment V8.5.5	C:\Program Files\IBM\ODM871\WAS\App
Operational Decision Manager V8.7.1	C:\Program Files\IBM\ODM871\ODM

Update all packages with recommended updates and recommended fixes

Details

Operational Decision Manager V8.7.1

- Shared Resources Directory: C:\Program Files (x86)\IBM\IMShared
- Installation Directory: C:\Program Files\IBM\ODM871\ODM
- Translations: French, Unknown
- Architecture: 64-bit

Installed Packages and Fixes

- Decision Center 8.7.1.0
- Decision Center profile templates for WebSphere Application Server 8.7.1.0
- Decision Server Rules 8.7.1.0
- Decision Server Rules profile templates for WebSphere Application Server 8.7.1.0

(?)

- ___ c. Click **Cancel** again to return to the main menu.
- ___ 4. View the Modify option.
 - ___ a. Click **Modify**.
 - ___ b. Click **OK** to close the repository warning.

You can use the Modify option to change the installed software packages by adding or removing features and function.

In this case, notice the package group names and the installation directories.

The screenshot shows the 'IBM Installation Manager' interface with the title 'Modify Packages'. A message says 'Select a package group to modify.' Below is a table:

Package Group Name	Directory
IBM WebSphere Application Server Network Deployment V8.5.5	C:\Program Files\IBM\ODM871\WAS\App
Operational Decision Manager V8.7.1	C:\Program Files\IBM\ODM871\ODM

Details

Operational Decision Manager V8.7.1

- Shared Resources Directory: C:\Program Files (x86)\IBM\IMShared
- Installation Directory: C:\Program Files\IBM\ODM871\ODM
- Translations: French, Unknown
- Architecture: 64-bit

Installed Packages and Fixes

- Decision Center 8.7.1.0
- Decision Center profile templates for WebSphere Application Server 8.7.1.0
- Decision Server Rules 8.7.1.0
- Decision Server Rules profile templates for WebSphere Application Server 8.7.1.0

(?)

< Back

- ___ c. Click **Cancel** to return to the IBM Installation Manager main page.

2.2. Viewing installation history

- ___ 1. From IBM Installation Manager, view the installation history.
 - ___ a. Click **File > Installation History**.

The Installation History window opens.

Installation History				
Date	Activity	Package Group Name	Status	Installation Packa
2015-05-21T07:22:00-07:00	Install	Operational Decision Manager V8.7.1	Success	Decision Center
2015-05-21T07:19:12-07:00	Install	Operational Decision Manager V8.7.1	Success	Decision Center
2015-05-21T07:18:25-07:00	Install	Operational Decision Manager V8.7.1	Success	Decision Server F
2015-05-21T07:14:15-07:00	Install	Operational Decision Manager V8.7.1	Success	Decision Server F
2015-05-21T07:10:33-07:00	Install	IBM WebSphere Application Server N...	Success	IBM WebSphere
2015-05-21T07:10:33-07:00	Install	IBM WebSphere Application Server N...	Success	IBM WebSphere
2015-05-21T07:09:55-07:00	Install	IBM Installation Manager	Success	IBM® Installation

The Installation History window provides a table of information about installation dates, activities, package group names, status, and packages.

The **Details** section includes more information about the installation for each installed component.

Details	
Start Time:	2015-05-21T07:19:12-07:00
End Time:	2015-05-21T07:21:26-07:00
Activity:	Install
Package Group Name:	Operational Decision Manager V8.7.1
Status:	Success
Installation Packages:	<ul style="list-style-type: none"> • Decision Center 8.7.1.0 • Decision Center • Rule Solutions for Office (for Windows only) • Local help system • Samples and Tutorials

- ___ b. Click **Close**.
- ___ 2. View the installed packages.
 - ___ a. To view the installed packages in IBM Installation Manager, click **File > View Installed Packages**.

A list of installed packages opens.

 **Installed Packages**

Installed Packages and Fixes

Installed Packages	Vendor	License
IBM WebSphere Application Server Network		
IBM WebSphere Application Server Net IBM	IBM	
IBM WebSphere SDK Java Technology E IBM	IBM	
IBM Operational Decision Manager V8.7.1		
Decision Center 8.7.1.0 IBM	IBM	
Decision Center profile templates for W IBM	IBM	
Decision Server Rules 8.7.1.0 IBM	IBM	
Decision Server Rules profile templates IBM	IBM	

Details

IBM WebSphere Application Server Network Deployment V8.5.5

- Shared Resources Directory: C:\Program Files (x86)\IBM\IMShared
- Installation Directory: C:\Program Files\IBM\ODM871\WAS\AppServer
- Translations: French, Unknown

___ b. Click **Close**.

Section 3. Modifying the installed software packages

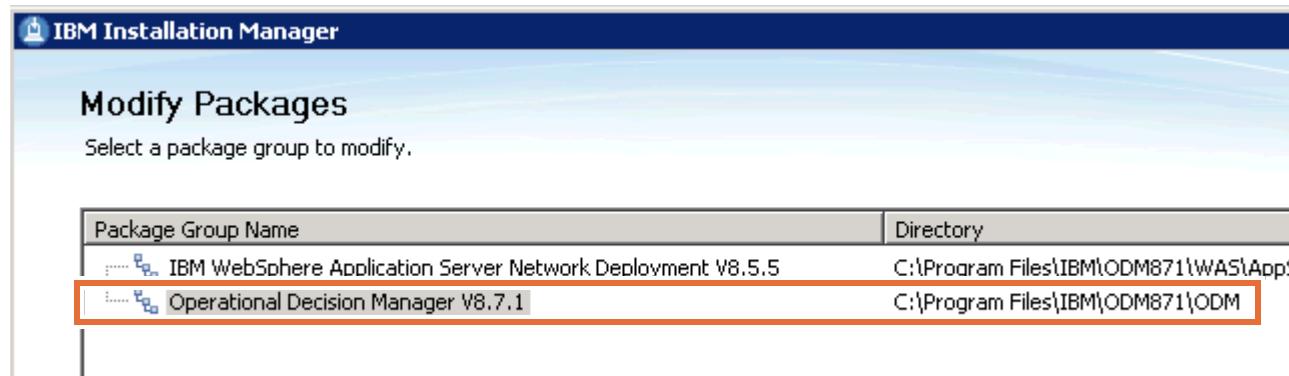
You can modify the installed software package by using the IBM Installation Manager.

- ___ 1. View the modification options for the installed software packages.
 - ___ a. From IBM Installation Manager, click **File > Open > Modify Packages**.

 **Note**

If you see warnings that some directories are not connected, you can ignore them for now.

- ___ b. Click **OK** to close the repository warning.
- ___ c. Click **Operational Decision Manager V8.7.1**.



- ___ d. Click **Next**.
- ___ e. On the Modify Packages translations page, click **Next**.

The Modify Packages features page opens. It lists the installed packages and their components. For example, in the Decision Server Rules 8.7.1.0 package, you can modify any of the Decision Server Rules components.

The screenshot shows the 'IBM Installation Manager' interface with the title 'Modify Packages'. Below it, a message says 'Select the features to install or clear the features to remove.' A navigation bar at the top includes 'Modify', 'Features' (which is selected), and 'Summary'. The main area is titled 'Features' and displays a hierarchical tree of installed packages and their components. The 'Decision Server Rules 8.7.1.0' package is expanded, showing its sub-components: 'Decision Server Rules', 'Rule Designer', 'Scorecard Modeler', 'Rule Execution Server', and 'Rule Execution Server: Installation artifacts for other application servers'. This last node has four sub-options: 'Rule Execution Server for Tomcat', 'Rule Execution Server for JBoss', 'Rule Execution Server for WebLogic', and 'Rule Execution Server for Liberty profile'. Other checked features include 'Samples and Tutorials', 'Update sites for installation into other Eclipse products', and 'Local help system'. At the bottom of the tree view, there is another 'Decision Server Rules profile templates for WebSphere Application Server 8.7.1.0' entry. Below the tree view, there is a checkbox for 'Show dependencies' and a note indicating that some items are selected because of dependencies. A 'Details' section for 'Decision Server Rules 8.7.1.0' is shown, stating it's for business rules. A 'Disk Space Information' table shows disk usage for the 'Shared Resources Area' and 'Installation Directory' on drive C: with 58.85 GB available. Navigation buttons at the bottom include a question mark icon, a back arrow, and a 'Cancel' button.

- ___ f. Click **Expand All** to review all the components of each package.
You can select any features to install or clear any features to remove.
- ___ g. After reviewing the features, click **Cancel** to cancel the modification.
- ___ 2. Close Installation Manager.

Section 4. Verifying the contents of your installation

After installing the Operational Decision Manager components, you can verify the content of the installation directory.

- 1. In your file system, go to your `InstallDir` folder. By default, the installation directory is:

`C:\Program Files\IBM\ODM871`

The default installation directory for Operational Decision Manager components (**ODM_InstallDir**) is:

`C:\Program Files\IBM\ODM871\ODM`

The default installation directory for WebSphere Application Server (**WAS_InstallDir**) is:

`C:\Program Files\IBM\ODM871\WAS`

- 2. Use the following table to help you identify which Operational Decision Manager features are installed on your computer.

Component	Folders
ODM_InstallDir	
Decision Server Rules	
Rule Designer	studio
Rule Execution Server	executionserver
Getting started tutorials	gettingstarted
Sample server	shared/samplesServer
.NET engine and migration tool	dotnet
Decision Center	
Decision Center	teamserver Rule Solutions for Office (optional)
	WAS_InstallDir
Profile templates for WebSphere Application Server	AppServer/profileTemplates/rules (for rules profiles)



Note

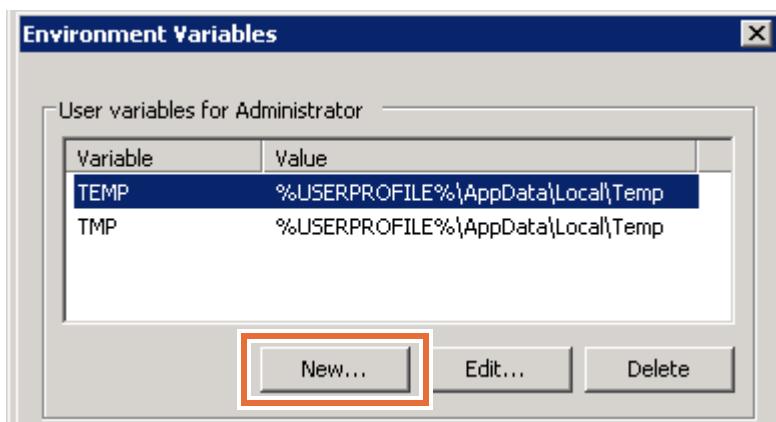
You install Decision Server Insights later in this course.

Section 5. Setting up your environment variables

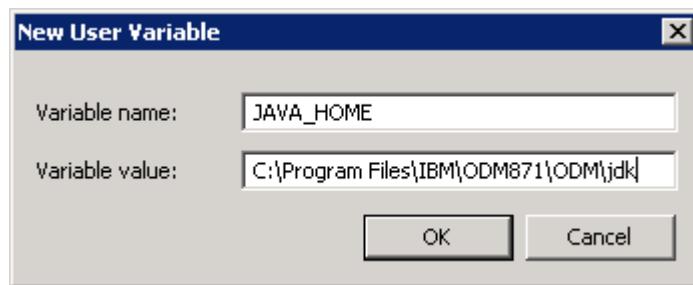
After installation, you can set up Windows environment variables that can be used for automated processes. You must ensure that you have the correct version of Ant and the correct variables for Java.

In this section, you add the Java and Ant paths to the Path system variable.

- __ 1. Add a `JAVA_HOME` user variable.
 - __ a. From the desktop, right-click **Computer**, and click **Properties**.
 - __ b. In the System window, click **Advanced system settings**.
The System Properties window opens to the **Advanced** tab.
 - __ c. Click **Environment Variables**.
 - __ d. Click **New** under **User variables for Administrator**.



- __ e. Set the variable name to: `JAVA_HOME`
- __ f. Set the variable value to the installation path for your JDK.

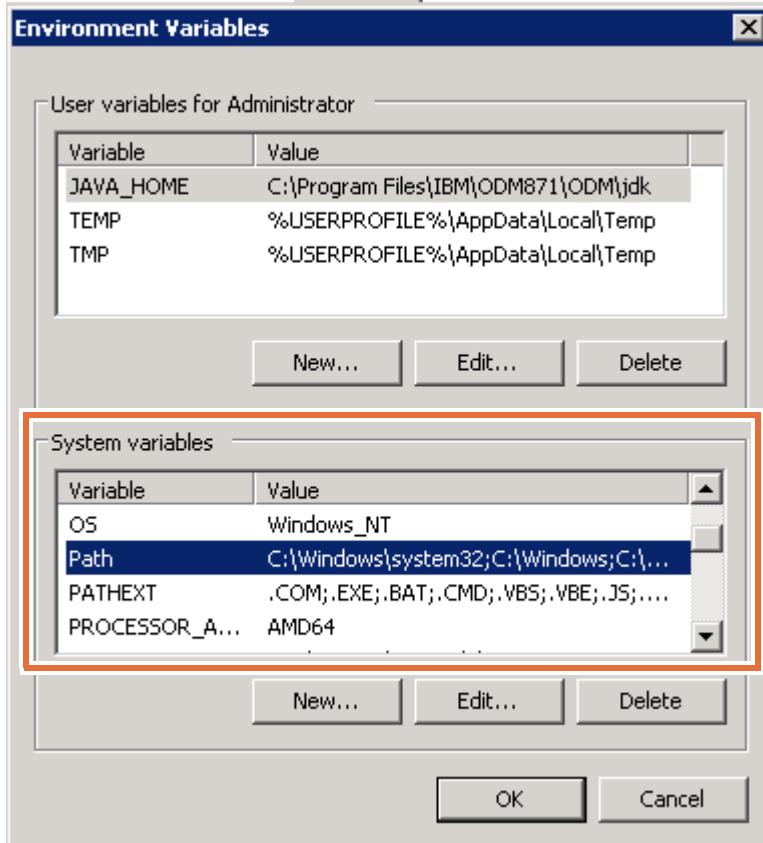


Information

The default installation path is: `C:\Program Files\IBM\ODM871\ODM\jdk`

- __ g. Click **OK**.

- __ 2. In the Environment Variables window, add the Java and Ant paths to the Path variable value.
- __ a. In the **System variables** section of the Environment Variables window, click Path.



- __ b. Click **Edit**.

Add the following paths to the beginning of the variable value: %JAVA_HOME%\bin;
C:\Program Files\IBM\ODM871\ODM\shared\tools\ant\bin;



Hint

You can copy and paste the Java and Ant paths from the `exploreODM.txt` file in the `<TrainingDir>\code` directory.

- __ c. Click **OK** to close the window.
- __ d. Click **OK** to return to **System Properties**, and then click **OK** to close the window.
- __ 3. Test that your variables are set correctly.
- __ a. Open a command prompt window and type: ant -version
- __ b. Press Enter.

You should see the message:

Apache Ant version 1.7.1 compiled on June 27 2008

___ c. Close the command prompt window.

End of exercise

Exercise review and wrap-up

The first part of the exercise is to explore the IBM Installation Manager, and then modify the installed software packages.

Exercise 2. Configuring Rule Execution Server on WebSphere Application Server

What this exercise is about

This exercise covers the manual configuration of Rule Execution Server on WebSphere Application Server.

What you should be able to do

After completing this exercise, you should be able to:

- Configure Rule Execution Server

Introduction

In the first part of this exercise, you learn how to work with the WebSphere Application Server Profile Management Tool. Next, you manually configure the Rule Execution Server.

This exercise includes these sections:

- Section 1, "Creating a profile by using the Profile Management Tool"
- Section 2, "Configuring Rule Execution Server"
- Section 3, "Configuring user access"
- Section 4, "Post-deployment configuration steps"



Information

To see how to automatically configure Rule Execution Server, see Exercise 4, "Using a profile template to configure Rule Execution Server".

Requirements

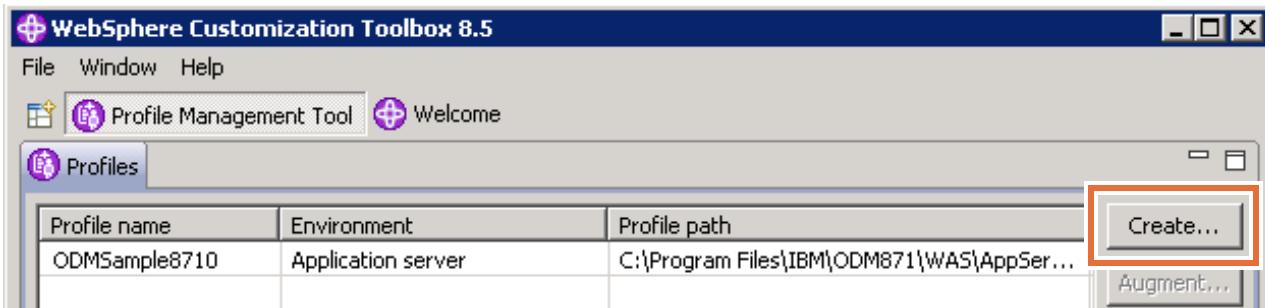
Make sure that you completed the environment variable setup from Exercise 1, "Exploring the Operational Decision Manager installation".

Section 1. Creating a profile by using the Profile Management Tool

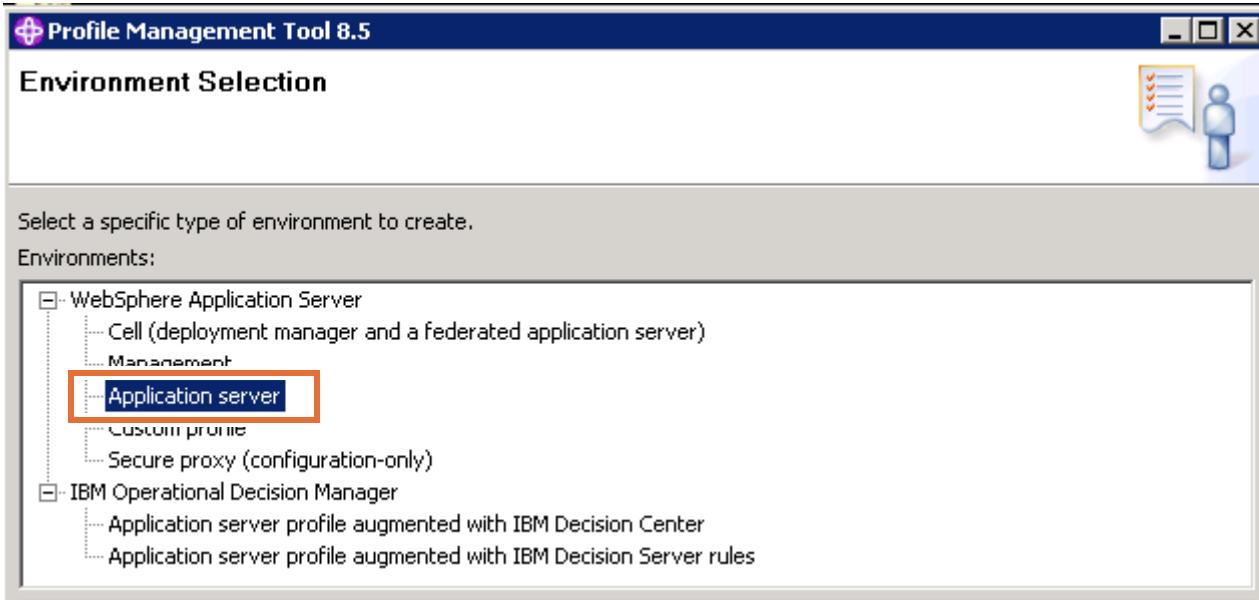
Before you create an instance of Rules Execution Server, you must create a profile. You can use the Profile Management Tool to create it.

- __ 1. Start the Profile Management Tool.
 - __ a. To start the Profile Management Tool, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Tools > Profile Management Tool**.

The Profile Management Tool opens.

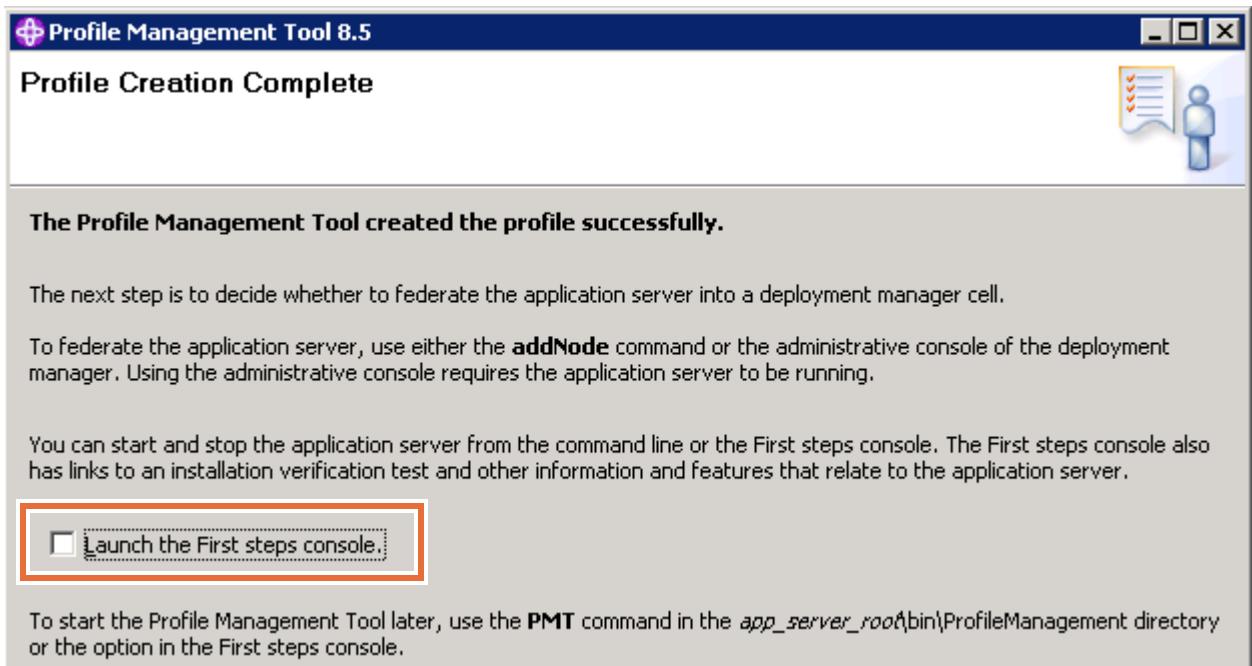


- __ 2. Create an application server profile.
 - __ a. In the Profile Management Tool, click **Create**.
 - __ b. On the Environment page, expand **WebSphere Application Server**, make sure that **Application server** is selected, and click **Next**.

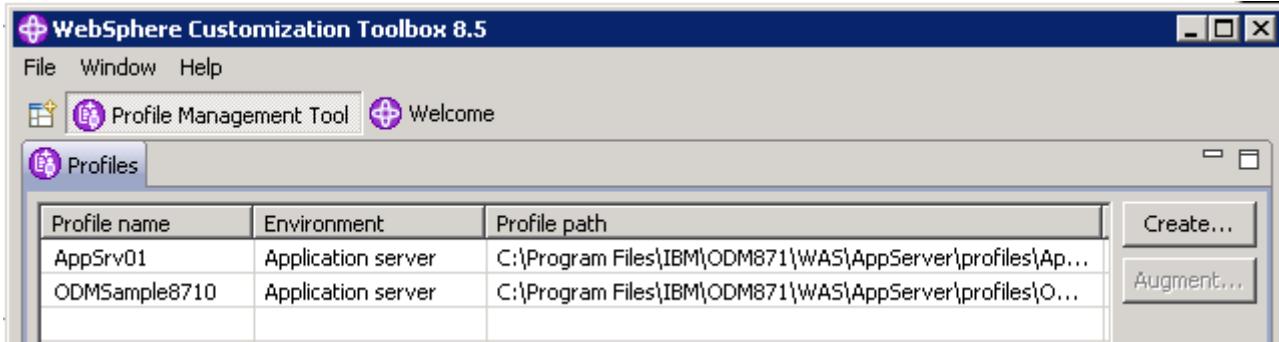


- __ c. On the Profile Creation Options page, click **Typical profile creation**, and click **Next**.

- ___ d. On the Administrative Security page, make sure that the **Enable administrative security** check box is selected, and enter the following information (case-sensitive):
 - **User name:** odmAdmin_lab
 - **Password:** odmAdmin_lab
 - **Confirm password:** odmAdmin_lab
- ___ e. Click **Next**.
- ___ f. Review the Profile Creation Summary page and click **Create**.
It takes about 4-5 minutes to create the profile.
- ___ g. When you see the message that the profile was created successfully, clear the **Launch the First steps console** option and click **Finish** to return to the tool.



The AppSrv01 profile is listed as a profile.



- ___ 3. Exit the Profile Management Tool by clicking **File > Exit**.

Section 2. Configuring Rule Execution Server

Now that you have a new application server profile, you can manually install and configure Rule Execution Server on that new profile.

Manually configuring Rule Execution Server on WebSphere Application Server involves the following steps. You walk through most of the steps during this exercise.

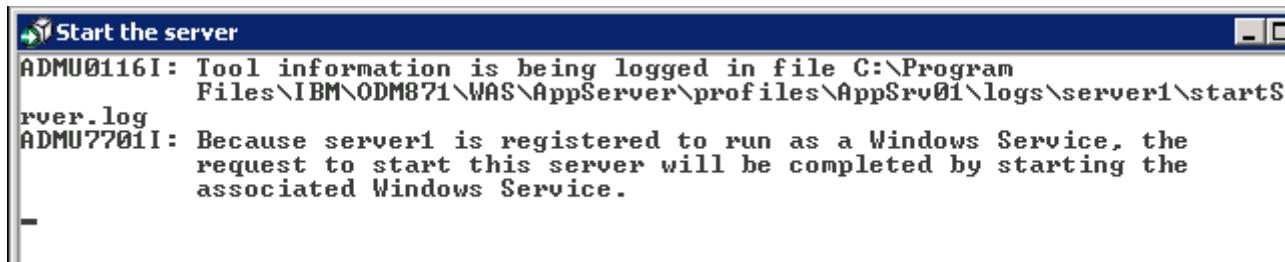
Configuration task	To do in this exercise
"Step 1: Selecting and applying the persistence type"	No
"Step 2: Enforcing the database user permissions"	No
"Step 3: Creating an empty database schema"	No
"Step 4: Setting up a data source and connection pool"	Yes
"Step 5: Activating security on WebSphere Application Server"	Yes
"Step 6: Deploying the Rule Execution Server management EAR"	Yes
"Step 7: Populating a Rule Execution Server database"	Yes
"Step 8: Deploying the MBean descriptors"	Yes
"Step 9: Deploying the XU RAR"	Yes
"Step 10: Deploying the hosted transparent decision service EAR (optional)"	No
"Step 11: Defining the DecodeUrlAsUTF8 custom property (optional)"	No
"Step 12: Verifying the deployment and configuration"	Yes

For this exercise, you use some default settings and are not required to complete all the configuration tasks.

2.1. Starting the application server for your new profile

- 1. Start the application server by clicking **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Start the server.**

It takes a few moments to start the server.



```
Start the server
ADMU0116I: Tool information is being logged in file C:\Program
Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\logs\server1\startS
erver.log
ADMU7701I: Because server1 is registered to run as a Windows Service, the
request to start this server will be completed by starting the
associated Windows Service.
```

After the server starts, the command prompt window disappears.

2.2. Starting the administrative console for WebSphere Application Server

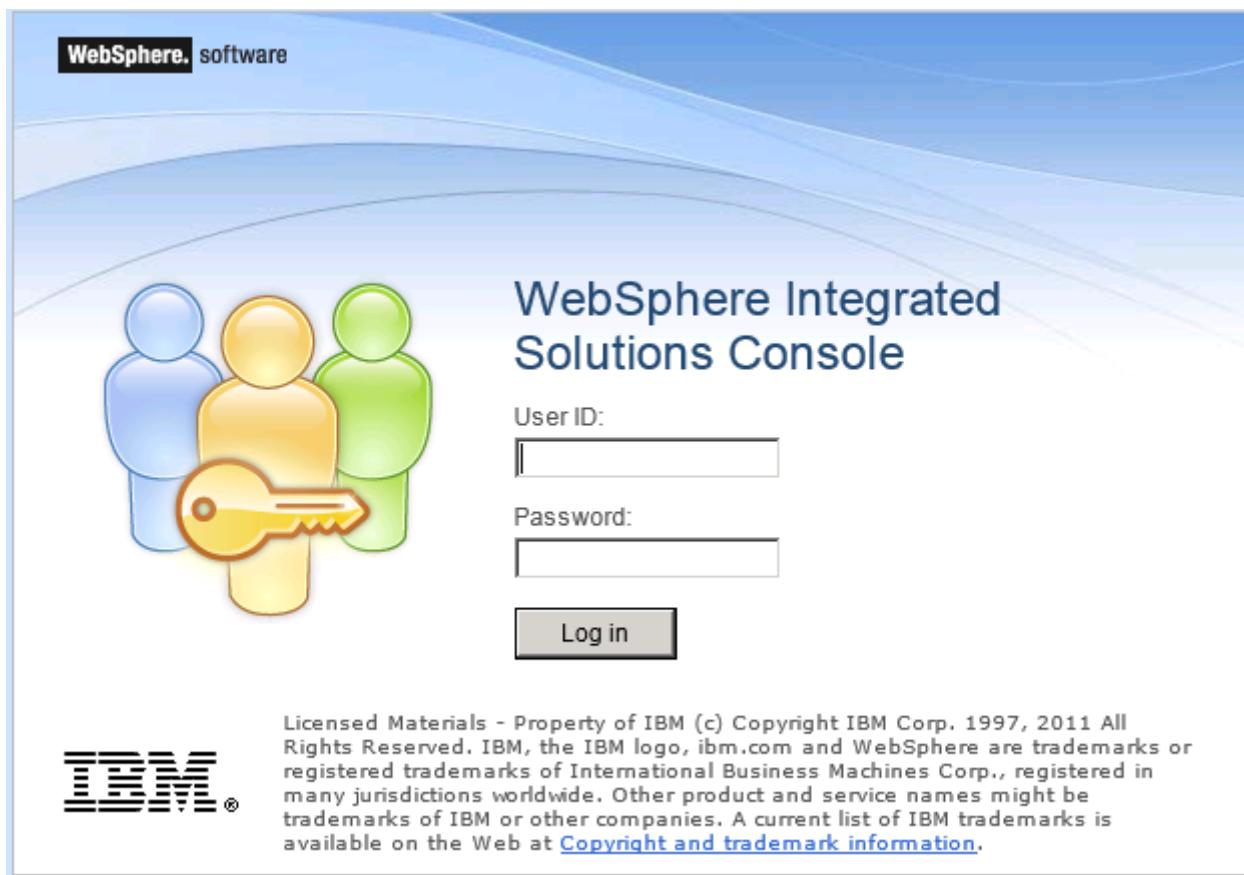
- 1. Open the administrative console by clicking **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Administrative console.**

A security warning opens.

- 2. Continue to the web page according to the instructions for your browser.

For example, in Mozilla Firefox, click **I Understand the Risks** and **Add Exception**, and then click **Confirm Security Exception**.

The administrative console (WebSphere Integrated Solutions Console) login page opens.



- 3. Enter the following credentials in the login page, and click **Log in**.
 - **User ID:** `odmAdmin_lab`
 - **Password:** `odmAdmin_lab`

The Welcome page opens.

Suite Name	Version
WebSphere Application Server	8.5.5.4

2.3. Step 1: Selecting and applying the persistence type

By default, the persistence is set to data source for both RuleApps and managed Java XOMs in the deployment descriptor of the Rule Execution Server management archive.

You can change the default data source RuleApp and Java XOM persistence settings by running an Ant script that generates a new Rule Execution Server management archive.

To change the persistence settings, the software provides an Ant script in the following directory:

```
C:\Program Files\IBM\ODM871\ODM\executionserver\bin\ressetup.xml
```

You can use this file to create an instance of the Rule Execution Server management archive and in the case of a Java EE application server, the Execution Unit (XU).

In this class, you do not change any settings for the persistence type because the class image uses the default persistence type, which is the data source.

2.4. Step 2: Enforcing the database user permissions

For this course, you use Derby as the default database. The user permissions are set when the database is created. Therefore, you do not do anything in this step.

If you use other database products, for example, DB2, then you must set up user permissions.

2.5. Step 3: Creating an empty database schema

By default, for this class image, you use Derby as the default database. The database schema is created when the database is populated later on in step 7.

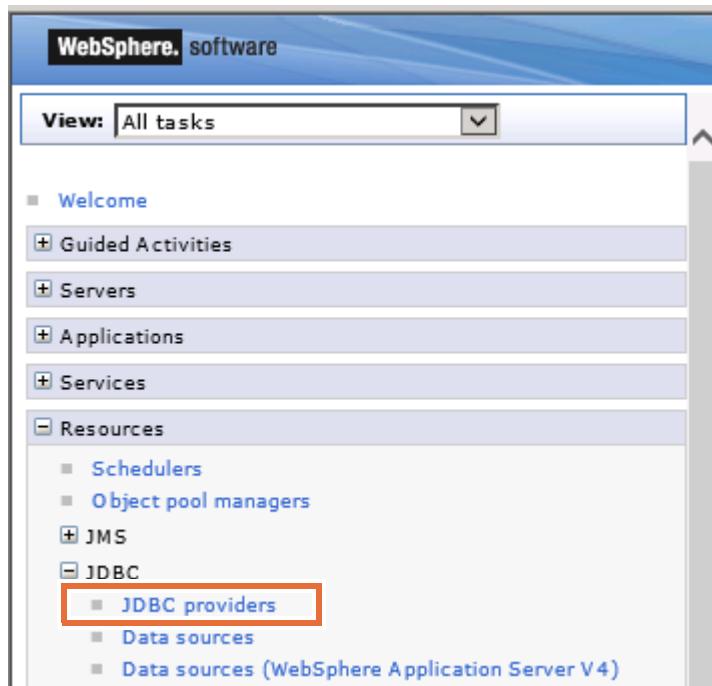
Therefore, there is no further action in this step.

2.6. Step 4: Setting up a data source and connection pool

— 1. In the administrative console, define a JDBC provider with the following values.

- **Scope:** Node=odmHost1Node01, Server=server1
- **Database type:** Derby
- **Provider type:** Derby JDBC Provider
- **Implementation type:** XA data source

— a. Click Resources > JDBC > JDBC providers.



— b. In the Scope section under “JDBC providers,” select:
Node=odmHost1Node01, Server=server1.

The screenshot shows the 'JDBC providers' configuration page. The top header says 'Cell=odmHost1Node01Cell, Profile=AppSrv01' and 'Close page'. The main title is 'JDBC providers'. Below it is a descriptive text about editing JDBC provider properties. A note says 'Scope specifies the level at which the resource definition is visible. For detailed information on what scope is and how it works, [see the scope settings help](#)'. A dropdown menu labeled 'Scope: =All scopes' is shown, with 'All scopes' selected. A 'New...' button is highlighted with a red box, and the value 'Node=odmHost1Node01, Server=server1' is entered into its input field.

It takes a moment for the scope to update on the screen.

The screenshot shows a web-based configuration interface for JDBC providers. At the top, there's a blue header bar with the title "JDBC providers". Below the header, the main content area has a section titled "JDBC providers" with a brief description of what it does. A specific configuration entry is highlighted with an orange border:

Scope: Cell=odmHost1Node01Cell, Node=odmHost1Node01, Server=server1

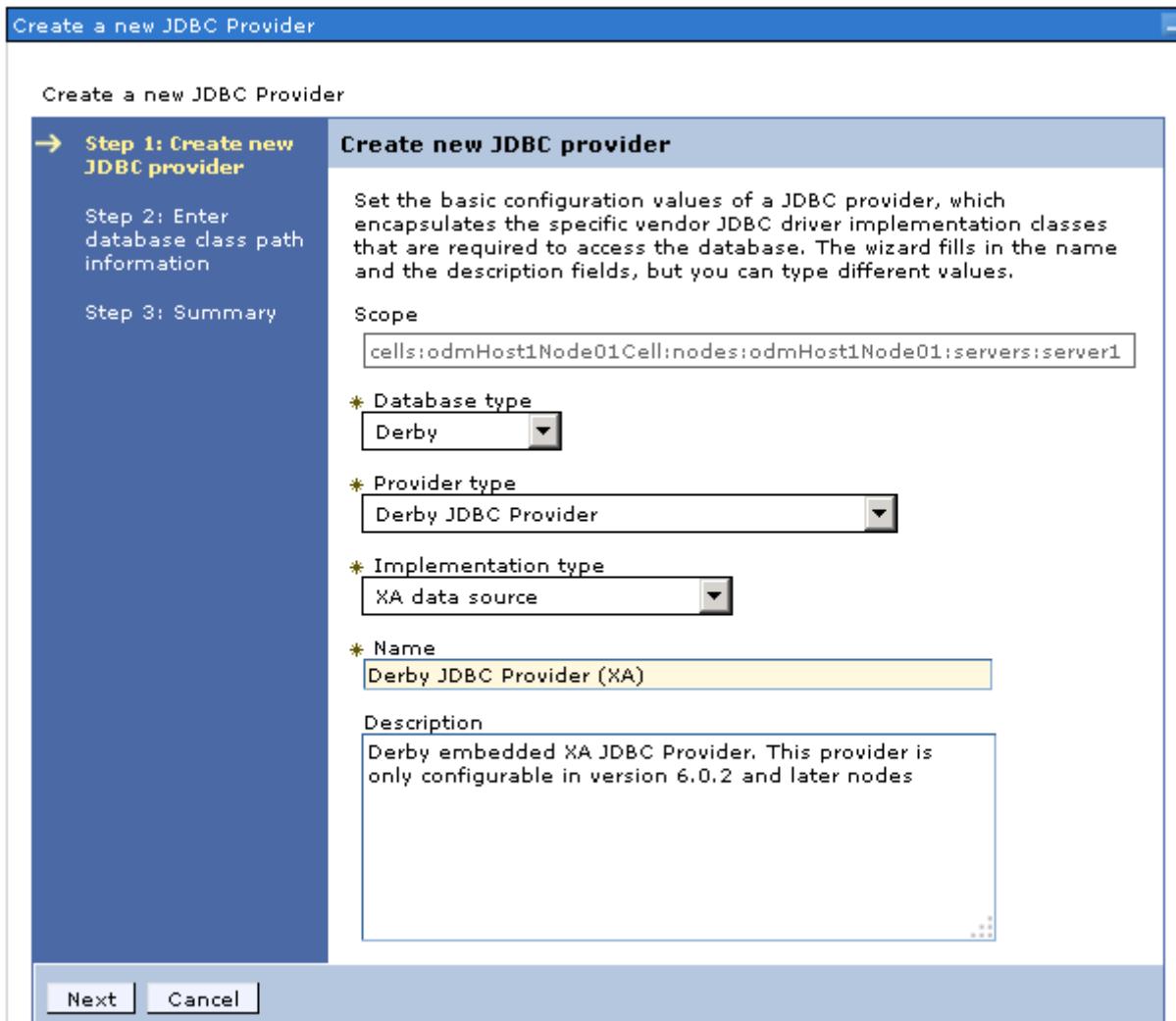
Below this, there's a note about "Scope" and a dropdown menu set to "Node=odmHost1Node01, Server=server1".

At the bottom of the configuration list, there are two buttons: "New..." and "Delete". The "New..." button is highlighted with a red box.

__ c. Click **New...**.

___ d. In the “Create a new JDBC provider” window, select the following values:

- **Database type:** Derby
- **Provider type:** Derby JDBC Provider
- **Implementation type:** XA data source



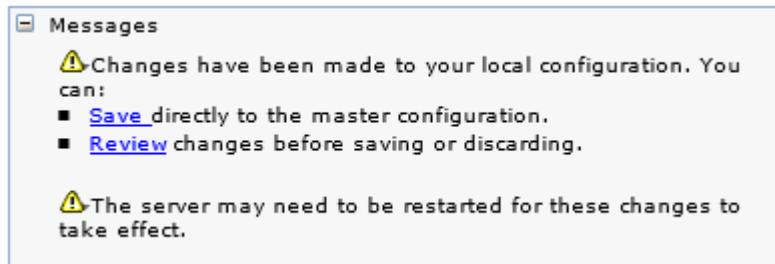
___ e. Click **Next**.

The Summary page opens.

Summary	
Summary of actions:	
Options	Values
Scope	cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:server1
JDBC provider name	Derby JDBC Provider (XA)
Description	Derby embedded XA JDBC Provider. This provider is only configurable in version 6.0.2 and later nodes
Class path	\${DERBY_JDBC_DRIVER_PATH}/derby.jar
Implementation class name	org.apache.derby.jdbc.EmbeddedXADataSource

Previous **Finish** **Cancel**

- ___ f. Click **Finish**.
- ___ g. In the Messages window, click **Save** to save directly to the master configuration.



- ___ 2. Define the Derby JDBC provider (XA) for Rule Execution Server.
- ___ a. In the “JDBC providers” section, click the **Derby JDBC Provider (XA)** link.

<input type="checkbox"/>	Derby JDBC Provider (XA)	Node=odmHost1Node01,Server=server1	Derby embedded XA JDBC Provider. This provider is only configurable in version 6.0.2 and later nodes
--------------------------	--	------------------------------------	--

- ___ b. Under Additional Properties, click **Data sources**.
- ___ c. Click **New**.

- ___ d. In the **JNDI name** field, type `jdbc/resdatasource` and click **Next**.

Step 1: Enter basic data source information

Set the basic configuration values of a datasource for association with your JDBC provider. A datasource supplies the physical connections between the application server and the database.

Requirement: Use the Datasources (WebSphere(R) Application Server V4) console pages if your applications are based on the Enterprise JavaBeans(TM) (EJB) 1.0 specification or the Java(TM) Servlet 2.2 specification.

Scope
cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:server1

JDBC provider name
Derby JDBC Provider (XA)

*** Data source name**
Derby JDBC Driver XA DataSource

*** JNDI name**
jdbc/resdatasource

Next | **Cancel**

- ___ e. In the **Database name** field, enter the installation path for `resdb`.

The default path is:

C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\databases\resdb

- ___ f. Clear the **Use this data source in container managed persistence (CMP)** check box.

Step 1: Enter basic data source information

Step 2: Enter database specific properties for the data source

Set these database-specific properties, which are required by the database vendor JDBC driver to support the connections that are managed through the datasource.

Name	Value
* Database name	AppSrv01\databases\resdb

Use this data source in container managed persistence (CMP)

Previous | **Next** | **Cancel**

- ___ g. Click **Next**, and click **Next** again to skip the “Setup security aliases” section.

- __ h. Review the summary information and click **Finish**.

Step 1: Enter basic data source information Step 2: Enter database specific properties for the data source Step 3: Setup security aliases → Step 4: Summary	Summary Summary of actions: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d9e1f2;">Options</th> <th style="background-color: #d9e1f2;">Values</th> </tr> </thead> <tbody> <tr> <td>Scope</td> <td>cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:ser</td> </tr> <tr> <td>Data source name</td> <td>Derby JDBC Driver XA DataSource</td> </tr> <tr> <td>JNDI name</td> <td>jdbc/resdatasource</td> </tr> <tr> <td>Select an existing JDBC provider</td> <td>Derby JDBC Provider (XA)</td> </tr> <tr> <td>Implementation class name</td> <td>org.apache.derby.jdbc.EmbeddedXADataSource</td> </tr> <tr> <td>Database name</td> <td>C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv0\databases\resdb</td> </tr> </tbody> </table>	Options	Values	Scope	cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:ser	Data source name	Derby JDBC Driver XA DataSource	JNDI name	jdbc/resdatasource	Select an existing JDBC provider	Derby JDBC Provider (XA)	Implementation class name	org.apache.derby.jdbc.EmbeddedXADataSource	Database name	C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv0\databases\resdb
Options	Values														
Scope	cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:ser														
Data source name	Derby JDBC Driver XA DataSource														
JNDI name	jdbc/resdatasource														
Select an existing JDBC provider	Derby JDBC Provider (XA)														
Implementation class name	org.apache.derby.jdbc.EmbeddedXADataSource														
Database name	C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv0\databases\resdb														

- __ i. Click **Save** to save directly to the master configuration.

- __ 3. Define JAAS - J2C authentication data.

- __ a. On the **Data sources** page, click the **Derby JDBC Driver XA DataSource** link.
- __ b. In Related Items, click **JAAS - J2C authentication data**.
- __ c. Click **New**.
- __ d. In General Properties, enter the following values:
 - **Alias** = ResDerbyUser
 - **User ID** = resAdminDB
 - **Password** = resAdminDB
- __ e. Click **Apply**.

JDBC providers

[? | -](#)

JDBC providers > Derby JDBC Provider (XA) > Data sources > Derby JDBC Driver XA DataSource > JAAS - J2C authentication data > New...

Specifies a list of user identities and passwords for Java(TM) 2 connector security to use.

General Properties

* Alias:

* User ID:

* Password:

Description:

Apply

- __ f. Click **Save** to save directly to the master configuration.

- ___ 4. Set the component-managed authentication and the container-managed authentication aliases.
- ___ a. Click the **Derby JDBC Driver XA DataSource** breadcrumb to return to the Derby JDBC Driver XA DataSource page.
 - ___ b. Scroll down to the “Security settings” section and select the following values:
 - For **Component-managed authentication alias**, select: **odmHost1Node01/ResDerbyUser**
 - For **Container-managed authentication alias**, select: **odmHost1Node01/ResDerbyUser**
 - ___ c. Click **Apply**.

Security settings

Select the authentication values for this resource.

Authentication alias for XA recovery
(**none**)

Component-managed authentication alias
odmHost1Node01/ResDerbyUser

Mapping-configuration alias
(**none**)

Container-managed authentication alias
odmHost1Node01/ResDerbyUser

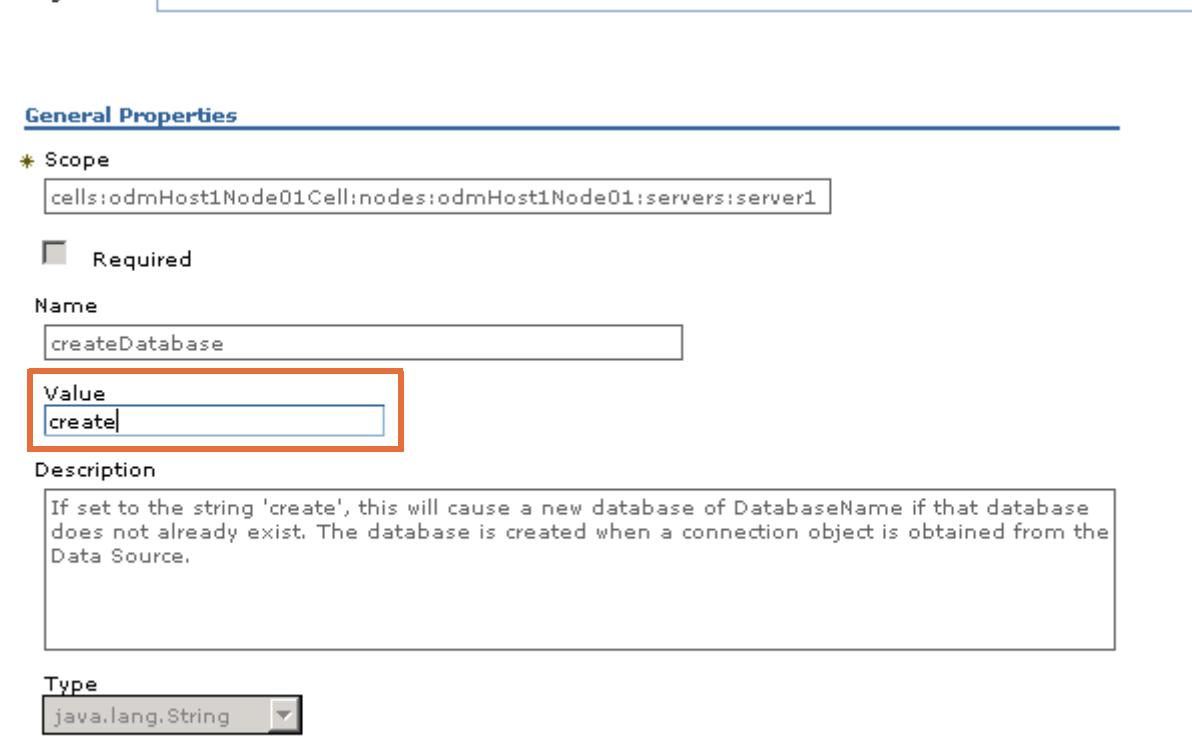
Common and required data source properties

Name	Value
* Database name	C:\Program Files\IBM\ODM87

Apply **OK** **Reset** **Cancel**

- ___ d. Click **Save** to save directly to the master configuration.
- ___ 5. Set the **createDatabase** custom property for the data source to create.
 - ___ a. On the “Data sources” page, click the **Derby JDBC Driver XA DataSource** link.
 - ___ b. In **Additional Properties**, click **Custom properties**.
 - ___ c. Click the **createDatabase** link.

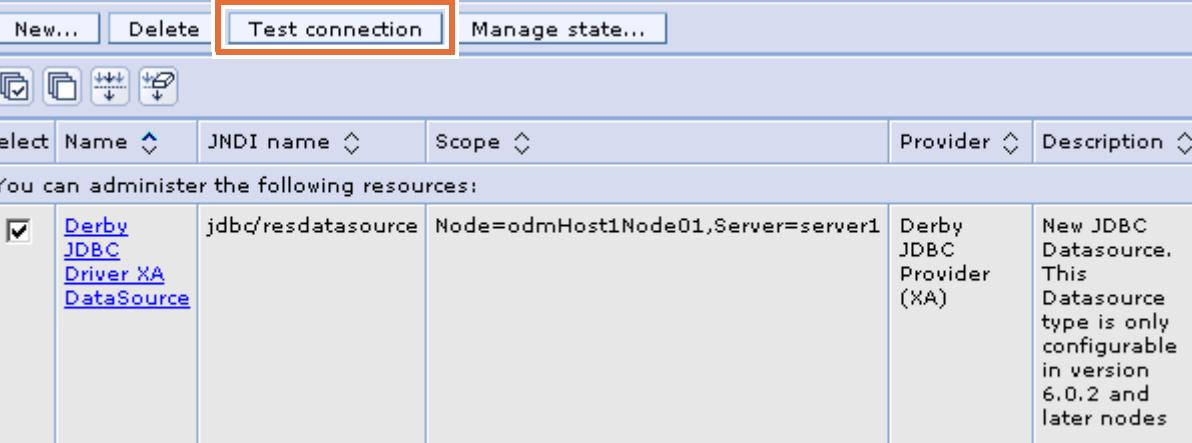
- __ d. Enter **create** in the **Value** field and click **Apply**.



The screenshot shows the 'General Properties' configuration dialog. The 'Value' field, which contains the value 'create', is highlighted with a red box. The 'Name' field is set to 'createDatabase'. The 'Type' dropdown is set to 'java.lang.String'. At the bottom, there are buttons for 'Apply', 'OK', 'Reset', and 'Cancel'.

For a Derby data source, if you did not yet create the database, you can set the value of the **createDatabase** property to **create**. The database is created at the first database connection.

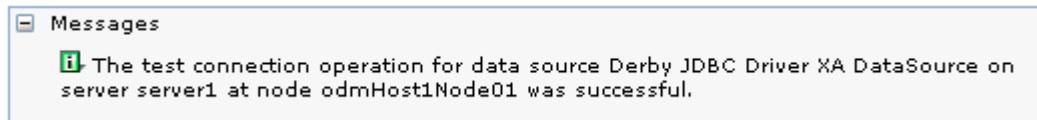
- __ e. Click **Save** to save directly to the master configuration.
- __ 6. Test the data source connection.
- __ a. Go to the **Data sources** page by clicking the **Data sources** breadcrumb.
- __ b. Select **Derby JDBC Driver XA DataSource** and click **Test connection**.



The screenshot shows the 'Data sources' page. A Derby JDBC Driver XA DataSource named 'jdbc/resdatasource' is selected, indicated by a checked checkbox. The 'Test connection' button above the table is highlighted with a red box. The table below lists the selected resource details.

Select	Name	JNDI name	Scope	Provider	Description
You can administer the following resources:					
<input checked="" type="checkbox"/>	Derby JDBC Driver XA DataSource	jdbc/resdatasource	Node=odmHost1Node01,Server=server1	Derby JDBC Provider (XA)	New JDBC Datasource. This Datasource type is only configurable in version 6.0.2 and later nodes

If the test connection is successful, you see a success message.



2.7. Step 5: Activating security on WebSphere Application Server

By default, the Rule Execution Server console does not require security in WebSphere Application Server. However, to activate access control for Rule Execution Server in WebSphere Application Server, you must create users and groups, and map the resAdministrative groups to the Monitor role.

- 1. In the side pane of the administrative console, click **Security > Global security**.



- __ 2. On the “Global security” page, select the following options:
- In the “Administrative security” section, make sure that **Enable administrative security** is selected.
 - In the “Application security” section, select **Enable application security**.

The screenshot shows the 'Security Configuration Wizard' interface. At the top, there are two tabs: 'Security Configuration Wizard' (selected) and 'Security Configuration R...'. Below the tabs, there are several sections:

- Administrative security**: Contains a checked checkbox for 'Enable administrative security' and three links: 'Administrative user roles', 'Administrative group roles', and 'Administrative authentication'.
- Application security**: Contains a checked checkbox for 'Enable application security'.
- Java 2 security**: Contains an unchecked checkbox for 'Use Java 2 security to restrict application access to local resources' and three sub-options: 'Warn if applications are granted custom permissions' (checked), 'Restrict access to resource authentication data' (unchecked).
- User account repository**: Contains fields for 'Realm name' (set to 'defaultWIMFileBasedRealm') and 'Current realm definition' (set to 'Federated repositories').
 - An 'Available realm definitions' dropdown is set to 'Federated repositories'.
 - Buttons for 'Configure...' and 'Set as current' are present.

At the bottom of the form are 'Apply' and 'Reset' buttons.

- __ 3. Click **Apply**.
__ 4. Click **Save** to save directly to the master configuration.

Section 3. Configuring user access

In this section, you define the user roles and groups for Rule Execution Server.

- resAdministrators
- resDeployers
- resMonitors

3.1. Defining user roles and groups

- 1. In the side pane, click **Users and Groups > Manage Groups**.



- 2. On the Manage Groups page, create your groups.

- a. Click **Create**.
- b. In the **Group name** field, type `resAdministrators` and click **Create**.

A message opens to show that the group was created successfully and offers the option to create another group.

- c. Click **Create Like**, create a group that is named `resDeployers`, and click **Create**.
- d. Click **Create Like** again, enter another group that is named `resMonitors`, and click **Create**.
- e. Click **Close**.

On the Manage Groups page, you see the groups that you created.

Manage Groups			
Select	Group name	Description	Unique Name
<input type="checkbox"/>	resAdministrators		cn=resAdministrators,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resDeployers		cn=resDeployers,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resMonitors		cn=resMonitors,o=defaultWIMFileBasedRealm

Page 1 of 1 Total: 3

- ___ 3. In the side pane, click **Users and Groups > Manage Users** to create users.



- ___ 4. On the Manage Users page, create a `resAdmin` user.

- ___ a. Click **Create**.

- __ b. Enter `resAdmin` for the following fields:

- User ID
- First name
- Last name
- Password
- Confirm password

Create a User

* User ID: resAdmin

* First name: resAdmin

* Last name: resAdmin

E-mail: [empty]

* Password: *****

* Confirm password: *****

Group Membership

Create **Cancel**



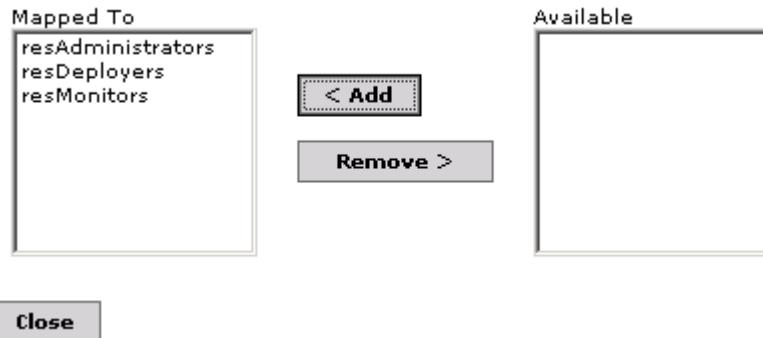
Note

Do not click **Create** yet.

- __ c. Click **Group Membership**, and click **Search**.

You want to add this `resAdmin` user to all of your groups that are listed in the Available column. To select more than one group, press and hold Ctrl, and then click the different groups that you want to select.

- __ d. Select the **resAdministrators**, **resDeployers**, and **resMonitors** groups, click **Add**, and then click **Close**.



- __ e. Click **Create**.

- __ f. Click **Close**.

The user ID `resAdmin` is created, and is mapped to the `resAdministrators`, `resDeployers`, and `resMonitors` groups.

Select					User ID	First name	Last name	E-mail	Unique Name
<input type="checkbox"/>	odmAdmin_lab	odmAdmin_lab	odmAdmin_lab						uid=odmAdmin_lab,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resAdmin	resAdmin	resAdmin						uid=resAdmin,o=defaultWIMFileBasedRealm

Page 1 of 1

Total: 2

___ 5. Create another user with a deployer role. Use the following values:

- Name: `resDeployer`
- Password: `resDeployer`
- Groups: Assign to **resDeployers** and **resMonitors**

___ 6. Create a user with a monitor role. Use the following values:

- Name: `resMonitor`
- Password: `resMonitor`
- Groups: Assign to **resMonitors**

Your group list should now include your new `resDeployer` and `resMonitor` users.

Select					User ID	First name	Last name	E-mail	Unique Name
<input type="checkbox"/>	odmAdmin_lab	odmAdmin_lab	odmAdmin_lab						uid=odmAdmin_lab,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resAdmin	resAdmin	resAdmin						uid=resAdmin,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resDeployer	resDeployer	resDeployer						uid=resDeployer,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resMonitor	resMonitor	resMonitor						uid=resMonitor,o=defaultWIMFileBasedRealm

Page 1 of 1

Total: 4

- ___ 7. Map the resAdministrator group to the Monitor administrative group role.
- ___ a. In the side pane of the administrative console, click **Users and Groups > Administrative group roles**.



- ___ b. Click **Add**.
- ___ c. From the **Role(s)** list, select **Monitor**.

The screenshot shows the 'Administrative group roles' configuration page. The title bar says 'Administrative group roles > Group'. The page has a note about enabling application administration. It features a 'Role(s)' dropdown menu with the following options: Deployer, ISC Admins, Monitor (which is selected and highlighted in blue), and Operator.

- ___ d. Click **Search**, and move the entry beginning with **resAdministrators** from the **Available** column to the **Mapped to role** column.



- ___ e. Click **OK**.
___ f. Click **Save** to save directly to the master configuration.

3.2. Restarting the server to apply your changes

Now that you mapped your users and groups, you must restart the server for these changes to take effect.

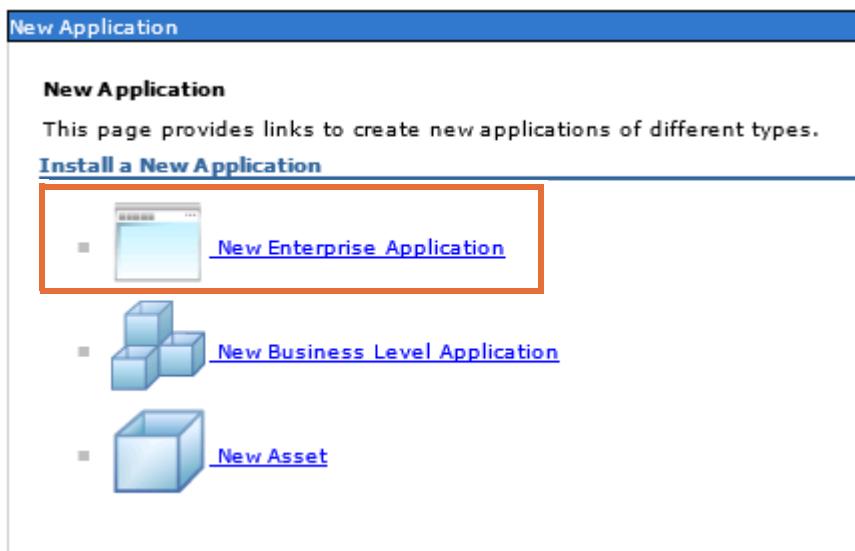
- ___ 1. Sign out of the console by clicking **Logout**.
Keep the browser open so you can sign back in after restarting the server.
- ___ 2. Restart the application server so that the changes take effect.
 - ___ a. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop the server**.
It takes a moment to stop the server. After the server stops, the command prompt window disappears.
 - ___ b. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Start the server**.
It takes a moment to start the server again. After the server starts, the command prompt window disappears.

3.3. Step 6: Deploying the Rule Execution Server management EAR

After you activate security, you deploy the Rule Execution Server EAR file to WebSphere Application Server.

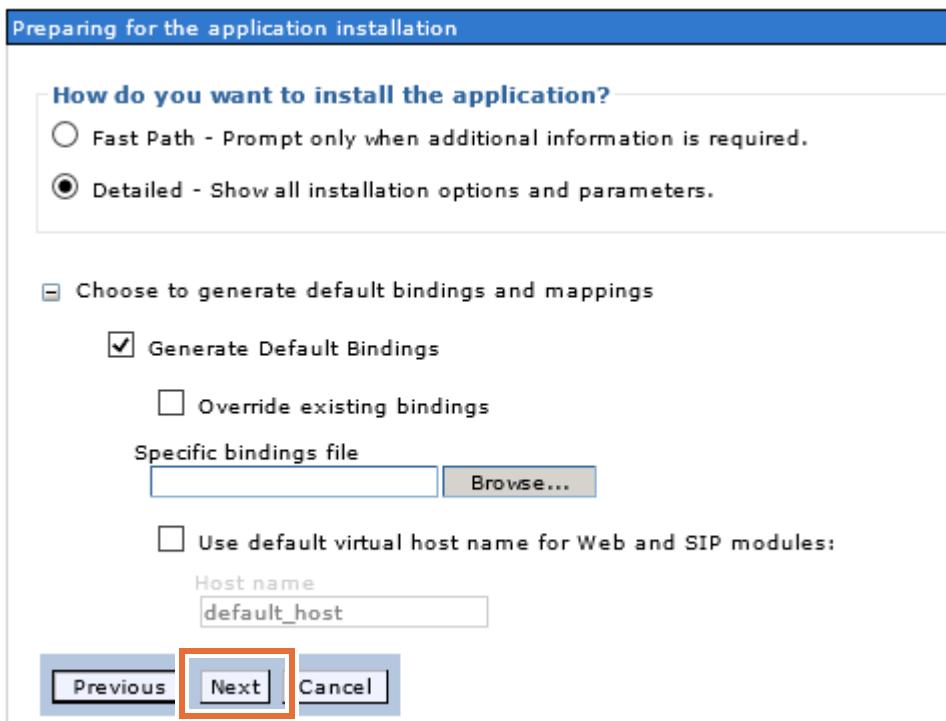
- ___ 1. Log back in to the WebSphere Integrated Solutions console by entering `odmAdmin_lab` in the **User Name** and **Password** fields.

- ___ 2. Install the `jrules-res-management-WAS85.ear` file as a new enterprise application.
- ___ a. In the side pane, click **Applications > New Application**, and click **New Enterprise Application**.



- ___ b. In the "Path to the new application" section, select **Local file system**, click **Browse** to the installation directory for Rule Execution Server.
The default path is:
`C:\Program Files\IBM\ODM871\ODM\executionserver\applicationservers\WebSphere85`
- ___ c. Select `jrules-res-management-WAS85.ear` and click **Open**.
- ___ d. Click **Next**.
- ___ e. Select the **Detailed - Show all installation options and parameters** option.

- __ f. Expand **Choose to generate default bindings and mappings**, select **Generate Default Bindings** and click **Next**.



- __ g. Click **Continue** to accept the security warning.
- __ h. Click **Next** to accept the default settings.
- __ 3. For Step 2 through Step 8, you can click **Next** to accept the default settings, or you can skip to Step 9. However, by clicking **Next** for each step, you have an opportunity to view the types of changes you can make for your environment.



Note

In Step 6, you might encounter a warning message that the JNDI name that was specified was not found, and that data source validation cannot be done. If you see this warning, click **Continue**. You resolve this warning in a later step.

- __ 4. Click **Step 9: Map security roles to users or groups**.
- __ 5. Map the resAdministrators role to the resAdministrators group.
- __ a. Select the check box next to the **resAdministrators** role.
- __ b. Click **Map groups**.
- __ c. Click **Search**. The groups are shown in the **Available** column.
- __ d. Click **resAdministrators** in the **Available** column, and then click the arrow to move resAdministrators to the **Selected** column.
- __ e. Click **OK** to return to the “Mapping Users to Roles” page.

6. Repeat the previous steps to map the roles of **resDeployers** and **resMonitors** for the other groups.

**Important**

Make sure that only the check box next to the role that you are assigning is selected.

Select	Role	Special subjects	Mapped users	Mapped groups
<input type="checkbox"/>	resAdministrators	None		resAdministrators
<input type="checkbox"/>	resDeployers	None		resDeployers
<input type="checkbox"/>	resMonitors	None		resMonitors

7. Click **Next**.
8. Click **Next** for **Step 10** and **Step 11** to accept the default settings.
9. In Step 12, which provides a summary, click **Finish**.

It might take a moment for the application to install.

**Information**

After the installation is complete, do not immediately save your changes to the master configuration. You first change the class loader order for the Rule Execution Server instance, then you save your changes.

- ___ 10. Change the class loader order to **Classes loaded with local class loader first (parent last)**.
- ___ a. Click **Manage Applications** at the bottom of the pane.

ADMA5013I: Application ILOG Rule Execution Server installed successfully.

Application ILOG Rule Execution Server installed successfully.

To start the application, first save changes to the master configuration.

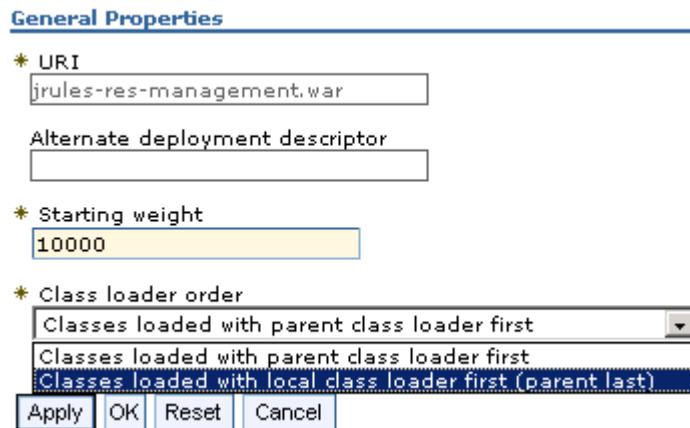
Changes have been made to your local configuration. You can:

- [Save](#) directly to the master configuration.
- [Review](#) changes before saving or discarding.

To work with installed applications, click the "Manage Applications" link.

[Manage Applications](#)

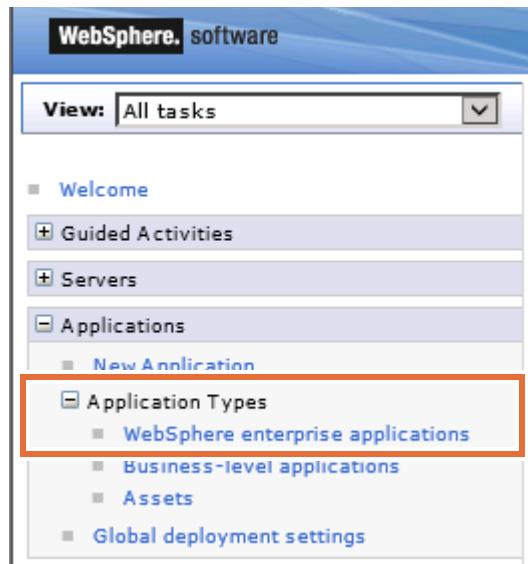
- ___ b. Click **ILOG Rule Execution Server**.
- ___ c. Under **Modules**, click **Manage Modules**.
- ___ d. Click **ILOG Rule Execution Server Console**.
- ___ e. Under **General Properties**, for **Class loader order**, select **Classes loaded with local class loader first (parent last)**.



- ___ f. Click **OK**.
- ___ g. Click **Save** to save directly to the master configuration.

3.4. Starting the application

- 1. Start the ILOG Rule Execution Server WebSphere enterprise application.
- a. In the side pane, click **Applications > Application Types > WebSphere enterprise applications**.



- 2. In the Enterprise Applications page, select the **ILOG Rule Execution Server** check box, and click **Start**.

The screenshot shows the 'Enterprise Applications' page. At the top, there's a toolbar with buttons: Start (highlighted with a red box), Stop, Install, Uninstall, Update, Rollout Update, Remove File, Export, and Export. Below the toolbar, there are filter icons. The main area has columns for 'Select', 'Name', and 'Application Status'. A message says 'You can administer the following resources:'. There are four entries: 'DefaultApplication' (unchecked), 'ILOG Rule Execution Server' (checked and highlighted with a red box), 'ivtApp' (unchecked), and 'query' (unchecked). The bottom of the table shows 'Total 4'.

When it starts successfully, the Application Status shows a green arrow and you see the following message:

Application ILOG Rule Execution Server on server server1 and node
odmHost1Node01 started successfully. The collection may need to be refreshed
to show the current status.

Enterprise Applications

Messages

i Application ILOG Rule Execution Server on server server1 and node odmHost1Node01 started successfully. The collection may need to be refreshed to show the current status.

Enterprise Applications

Use this page to manage installed applications. A single application can be deployed onto multiple servers.

+ Preferences

Start Stop Install Uninstall Update Rollout Update Remove File Export Export DI

Select Name Application Status

You can administer the following resources:

<input type="checkbox"/> DefaultApplication	
<input type="checkbox"/> ILOG Rule Execution Server	
<input type="checkbox"/> ivtApp	
<input type="checkbox"/> guery	

Total 4

3. Close the administrative console.

Section 4. Post-deployment configuration steps

In this section, you configure the deployed Rule Execution Server application.

4.1. Step 7: Populating a Rule Execution Server database

To populate a Rule Execution Server database, you can run the database scripts from the Rule Execution Server console and use the Installation Settings wizard if you work on Windows and other supported distributed platforms.

On Windows and distributed platforms, you can use the Installation Settings wizard of the Rule Execution Server console to choose a database schema and create the necessary database tables and views.

The Rule Execution Server console contains an Installation Settings wizard. If you are configuring your Rule Execution Server with database persistence and want to populate your database, you can use the wizard for the following purposes:

- Select the type of schema database resources that you want to create.
 - Create the required resources, in an empty database schema, to use Rule Execution Server.
- 1. Log on to the Rule Execution Server console with the `resAdmin` user ID and password.
 — a. Open the Rule Execution Server console in a browser by typing the following URL in a browser:

`http://localhost:9081/res`



Troubleshooting

If the page does not load, make sure that you have the correct port value for localhost.

1. Open a Windows Explorer window and go to the following directory:
`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\logs`
2. Open the file `AboutThisProfile.txt` with any text editor.
3. Read the value of `PORT` at the end of the line that starts with:
`HTTP transport port:`

A Rule Execution Server console login page opens.



Sign in to the Rule Execution Server console



User Name

Password

Sign In

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- __ b. Enter `resAdmin` in the **User Name** and **Password** fields.
- __ c. Click **Sign In**.



Troubleshooting

If you are using Internet Explorer to log in to the Rule Execution Server console and you see a warning that says the page cannot be displayed, try refreshing the browser.

The Installation Settings wizard page opens.

The screenshot shows the IBM Rule Execution Server console interface. At the top, there's a header bar with the IBM logo, the text "Rule Execution Server console", a "Skip to main content" link, and user information like "resAdmin" and "Sign Out". Below the header is a navigation bar with links for "About", "Print View", and "Help". The main content area is titled "Installation Settings Wizard" and features a section titled "RuleApps persistence details" with a blue info icon. This section contains a table of database connection parameters:

Database Product Name	Apache Derby
Database Product Version	10.8.3.1 - (1452645)
Driver Name	Apache Derby Embedded JDBC Driver
Driver Product Version	10.8.3.1 - (1452645)
JDBC URL	<code>jdbc:derby:C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\datasources\resdb</code>
Schemas	APP, NULLID, SQLJ, SYS, SYSCAT, SYSCS_DIAG, SYSCS_UTIL, SYSFUN, SYSIBM, SYSPROC, SYSSTAT
Username	resAdminDB

If you open the Rule Execution Server console with data source as the persistence setting and an empty database schema, the Installation Settings wizard opens.

The wizard can display two parts:

- It starts with RuleApp persistence details if you set data source persistence for RuleApps, whatever the persistence type for managed Java XOMs.
- Java XOMs persistence details are shown after RuleApp persistence details if you set data source persistence for both RuleApps and Java XOMs. In this case, you go through the same steps twice.

The wizard starts with Java XOM persistence details if you set the persistence type to file for RuleApps, and to data source for managed Java XOMs.

Both parts of the wizard are similar, and you use them in the same way.

The Welcome page provides the following information:

- Persistence details about the type of database used. These details include information about the driver and JDBC URL.
- A brief description of the purpose of the Installation Settings wizard.
- A diagnostic report that provides information about why the persistence check failed. The check fails because the database tables are not yet created.

The first section of the Installation Settings wizard that you see is Step 1: RuleApps.

Step 1: RuleApps - Welcome to the Installation Settings Wizard of Rule Execution Server

Use the Installation Settings Wizard to create resources in your database schema so that your repository can be loaded.

The repository has not been loaded because of the following reasons:

The persistence check failed. Diagnostic report:
DAO Class Name = ilog.rules.res.persistence.impl.jdbc.IlrGenericRepositoryDAO
Database Product Name = Apache Derby
Database Product Version = 10.8.3.1 - (1452645)
Driver Name = Apache Derby Embedded JDBC Driver
Driver Product Version = 10.8.3.1 - (1452645)
Ruleset enabled view test passed = False
RuleApp properties table test passed = False
RuleApps table test passed = False
Ruleset properties table test passed = False
Ruleset resources table test passed = False
Rulesets table test passed = False
Is Transaction Supported = True
JDBC URL = jdbc:derby:C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\databases\resdb
Username = resAdminDB.

Click **Next** to select a database schema type.

Back **Next**

- ___ 4. Click **Next**.
- ___ 5. In Step 2, verify that the **derby** option is selected from the **Database schema selected** list, and click **Next**.

Step 2: RuleApps - Choose the database schema

Depending on your database type, select a schema type to create the database resources required by Rule Execution Server. Select **custom** if you want to use a customized schema.

Database schema selected: **derby** 

Click **Next** to review the database schema.

Back **Next**

6. In Step 3, verify that the **Create SQL schema “resAdminDB”** option is selected, and click **Execute**.

Step 3: RuleApps - Review the database schema

You can now review the SQL statements that will be executed and select the following options:

Create SQL schema "resAdminDB":

Keep drop SQL statements:

[Show SQL statements](#)

Click **Execute** to launch the execution of SQL statements.

[Back](#) [Execute](#)

In Step 4, you see a success message if the SQL statements executed successfully.

Step 4: RuleApps - Installation Settings Wizard report

✓ SQL statements have been executed successfully.

[Show execution details](#)

Click **Finish** to complete the installation and go to the Rule Execution Server console.

[Back](#) [Finish](#)

7. Click **Finish**.
8. In Step 1 of the Java XOMs section of the Installation Settings wizard, click **Next** to see Java XOM persistence details.

Step 1: Java XOMs - Welcome to the Installation Settings Wizard of Rule Execution Server

Use the Installation Settings Wizard to create resources in your database schema so that your repository can be loaded.

The repository has not been loaded because of the following reasons:

The persistence check failed. Diagnostic report:

XOM DAO Class Name = com.ibm.rules.res.persistence.internal.jdbc.GenericXOMRepositoryDAO

XOM Database Product Name = Apache Derby

XOM Database Product Version = 10.8.3.1 - (1452645)

XOM Driver Name = Apache Derby Embedded JDBC Driver

XOM Driver Product Version = 10.8.3.1 - (1452645)

Is Transaction Supported for XOM = True

XOM JDBC URL = jdbc:derby:C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\databases\resdb

XOM Username = resAdminDB

Libraries table test passed = False

Library values table test passed = False

Resources table test passed = False.

Click **Next** to select a database schema type.

[Back](#) [Next](#)

- ___ 9. In Step 2, verify that **derby** is selected from the **Database schema selected** list, and click **Next**.

Step 2: Java XOMs - Choose the database schema

Depending on your database type, select a schema type to create the database resources required by Rule Execution Server. Select **custom** if you want to use a customized schema.

Database schema selected:

Click **Next** to review the database schema.

Next

- ___ 10. In Step 3, click **Execute**.

Step 3: Java XOMs - Review the database schema

You can now review the SQL statements that will be executed and select the following options:

Keep drop SQL statements:

[Show SQL statements](#)

Click **Execute** to launch the execution of SQL statements.

Execute

In Step 4, you see a success message if the SQL statements executed successfully.

Step 4: Java XOMs - Installation Settings Wizard report

✓ SQL statements have been executed successfully.

[Show execution details](#)

Click **Finish** to complete the installation and go to the Rule Execution Server console.

Finish

- ___ 11. Click **Finish**.

4.2. Step 8: Deploying the MBean descriptors

To configure Rule Execution Server for WebSphere Application Server, you must also deploy the MBean descriptors.

The Rule Execution Server architecture is based on the Java Management Extension (JMX) API. MBeans are Java objects that the JMX API uses. To configure Rule Execution Server for

WebSphere Application Server, you must deploy the MBean descriptors, either globally for all Rule Execution Server instances or for a single Rule Execution Server instance.

- 1. Return to the administrative console for WebSphere Application Server.
 - a. If the WebSphere Application Server administrative console is not already open, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Administrative console**.
 - b. If you receive a certificate warning, click **Continue to this website (not recommended)**.
 - c. Enter `odmAdmin_lab` in the **User Name** and **Password** fields.
 - d. Click **Log in**.
- 2. Define a class path property for the **server1** Java virtual machine.
 - a. In the side pane, click **Servers > Server Types > WebSphere application servers**.
 - b. Click **server1**.
 - c. In the **Server Infrastructure** section, expand **Java and Process Management** and click **Process definition**.
 - d. In the **Additional Properties** section, click **Java Virtual Machine**.
 - e. In the **Classpath** field, enter the following path:
`C:\Program Files\IBM\ODM871\ODM\executionserver\lib\jrules-mbean-descriptors.jar`
 - f. Click **OK**.
- 3. Click **Save** to save directly to the master configuration.

4.3. Step 9: Deploying the XU RAR

After you deploy the MBean descriptors, you deploy resource adapter archive (RAR) for the Execution Unit (XU) to WebSphere Application Server.

This phase of the Rule Execution Server configuration consists in deploying the Execution Unit (XU) RAR on WebSphere Application Server and add the properties by which to identify it. The RAR file contains the XU and the persistence layer.



Important

In some cases, because of your application constraints, you might be required to deploy the XU inside the application.

It is your decision to choose the appropriate deployment mode of the XU, either embed it into the EAR, or deploy it as a global connector. In any case, be aware of the following consequences.

When the XU is deployed as a global connector:

- The deployed Java EE applications might use its third-party libraries (such as ASM) instead of the libraries that are deployed in the application server.

- Use a parent last setting for the XU Java EE application if your Java EE application does not support the version of the third-party libraries that are distributed with Decision Server. If you cannot use a parent last setting, you might need to embed the XU into the EAR that executes the rules.

If you choose embedded packaging and the third-party library versions at the level of the application-server code library are not compatible with the XU, use a parent last setting for the code library.

- 
- 1. Install the `jrules-res-xu-WAS85.rar` file as a resource adapter.
 - a. In the side pane of the administrative console, click **Resources > Resource Adapters > Resource adapters**.
 - b. Click **Install RAR**.
 - c. In the Path section, select **Local file system**, and then click **Browse** to select the following directory:
`C:\Program Files\IBM\ODM871\ODM\executionserver\applicationservers\WebSphere85`
 - d. Select `jrules-res-xu-WAS85.rar` and click **Open**.
 - e. Click **Next**.
 - 2. On the General Properties page, replace the **Name** field value `XU` with `RES XU Resource Adapter`, and click **OK**.
 - 3. Define a new J2C connection factory for the RES XU resource adapter.
 - a. Click the **RES XU Resource Adapter** link.
 - b. Under **Additional Properties**, click **J2C connection factories**.
 - c. Click **New**.
 - d. Enter the following values:
 - **Name:** `xu_cf`
 - **JNDI name:** `eis/XUConnectionFactory`
 - e. Click **OK**.
 - 4. Click **Save** to save the changes to the master configuration.

You need more XU resource adapters when you have more than one node in your environment or you want to isolate the development environment and testing environment in one single node.

You can deploy a JCA resource adapter at any level, depending on the capability of the application server.

On WebSphere Application Server, you can install the XU resource adapter at the cell, node, cluster, or server level. However, you must install it at the node level before you can deploy it at other levels.

4.4. Restarting the server to apply your changes

Now that you mapped your users and groups, you must restart the server for these changes to take effect.

- 1. Sign out of the console and stop the application server.
 - a. Click **Logout** to log out of the administrative console.
 - b. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop the server**.

It takes a few moments to stop the server. After the server stops, the command prompt window disappears.

- 2. Restart the application server.
 - a. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Start the server**.

It takes a few moments for the server to start again. After the server starts, the command prompt window disappears.

4.5. Step 10: Deploying the hosted transparent decision service EAR (optional)

You can optionally deploy the EAR file for hosted transparent decision services. You must deploy the EAR file on the same node as the Execution Unit (XU). For more information, see the product documentation.

You do not take any further actions for this step.

4.6. Step 11: Defining the DecodeUrlAsUTF8 custom property (optional)

After you deploy the hosted transparent decision service EAR, you define the web container custom property DecodeUrlAsUTF8 to support localized ruleset paths. This step is optional. For more information, see the product documentation.

You do not take any further actions for this step.

4.7. Step 12: Verifying the deployment and configuration

It is a good practice to verify that Rule Execution Server was successfully deployed and configured by running the diagnostic tools.

By running the available diagnostic tools on Rule Execution Server, you can verify whether deployment and configuration were successful.



Information

This step is optional, but it is suggested.

- 1. Sign in again to the Rule Execution Server console with the `resAdmin` user ID and password.
 - a. Reopen the Rule Execution Server console in a web browser by using the following URL:
`http://localhost:9081/res`
 - b. Enter `resAdmin` in the **User Name** and **Password** fields.
 - c. Click **Sign In**.



Troubleshooting

If you are using Internet Explorer and see an error message that the page cannot be displayed, refresh the browser window.

- 2. Run the Rule Execution Server console diagnostic tools.
 - a. In the Rule Execution Server console, click the **Diagnostics** tab.



- b. Click **Run Diagnostics**.

When the diagnostic checks are complete, you see a report that lists all the diagnostic tests that just ran. A check mark is shown next to each test.

Diagnostics View

Diagnostics

Run Diagnostics

Expand All **Collapse All**

- + **MBean Factory** (Green checkmark)
- + **Local XU connectivity** (Green checkmark)
- + **XU MBean connectivity** (Green checkmark)
- + **Model MBean** (Green checkmark)
- + **Ruleset Resource Provider** (Green checkmark)
- + **XOM Resource Provider** (Green checkmark)
- **Decision Runner Resource Provider** (Yellow background)
 - Warning**
 - Diagnostic failed
Run the installation wizard to create database tables
- + **Create RuleApp** (Green checkmark)

Troubleshooting

If you see a warning for the Decision Runner Resource Provider, you can ignore it for this server profile for now.

- c. Click **Expand All** to show details about all of the diagnostic checks.

You can review the diagnostic checks to make sure that they ran successfully.

- __ d. Examine the results of the diagnostic checks.
- __ e. When you are done reviewing the results, click **Sign Out** and close the browser.

End of exercise

Exercise review and wrap-up

The first part of this exercise looked at how to use the Profile Management Tool to create a profile. Then, you saw how to manually configure the Rule Execution Server on WebSphere Application Server.

Exercise 3. Configuring Decision Center on WebSphere Application Server

What this exercise is about

This exercise covers the manual configuration of Decision Center on WebSphere Application Server.

What you should be able to do

After completing this exercise, you should be able to:

- Configure Decision Center

Introduction

In the previous exercise, you learned how to create an application server profile and configure Rule Execution Server on that profile.

This exercise continues with postinstallation configuration steps that are required on WebSphere Application Server, but for Decision Center.

This exercise includes these sections:

- Section 1, "Configuring Decision Center"
- Section 2, "Configuring user access"
- Section 3, "Deploying the application"
- Section 4, "Post-deployment configuration steps"

Requirements

Before proceeding, make sure that you complete Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server". This exercise continues configuration on the profile that you set up in the previous exercise.

Section 1. Configuring Decision Center

Configuring Decision Center on WebSphere Application Server involves several specific steps.

For this exercise, you use some default settings and are not required to complete all the configuration tasks.

Configuration task	To do in this exercise
"Step 1: Enforcing database user permissions"	No
"Step 2: Creating a data source and connection pool"	Yes
"Step 3: Defining user roles and groups"	Yes
"Step 4: Deploying the Decision Center management EAR"	Yes
"Step 5: Verifying the deployment of the Decision Center Enterprise console"	Yes
"Step 6: Completing the installation of Decision Center"	Yes

1.1. Step 1: Enforcing database user permissions

Decision Center data is stored in a database. You restrict the type of operations that a user can perform on a database by defining access privileges.

By default, you use the Derby database in this class image, so you do not take any further action in this step.

If you use other database products, for example, DB2, consult your database administrator.

1.2. Step 2: Creating a data source and connection pool

When your database is already running, you can create a JDBC provider, a data source, and a connection pool. You can change the data source properties if necessary. Then, you establish the connection.

- 1. Open the WebSphere Application Server administrative console for the AppSrv01 profile, and log on with the `odmAdmin_lab` user ID and password.
 - a. If the administrative console is not already open, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Administrative console**.
 - b. If prompted with a security warning, follow the browser instructions to continue to the website.
 - c. Enter `odmAdmin_lab` in the **User Name** and **Password** fields.
 - d. Click **Log in**.
- 2. Define a new JDBC provider for Decision Center.
 - a. In the side pane, click **Resources > JDBC**, and click **JDBC Providers**.
 - b. In the Scope section, make sure that **Node=odmHost1Node01, Server=server1** is selected.
 - c. Click **New**.

___ d. In the “Create new JDBC provider” section, select the following values:

- **Database type:** Derby
- **Provider type:** Derby JDBC Provider
- **Implementation type:** Connection pool data source
- **Name:** Derby JDBC Provider Non-XA



- ___ e. Click **Next**.
- ___ f. Click **Finish**.
- ___ g. Click **Save** to save directly to the master configuration.
- ___ 3. Define the data source for the new Derby JDBC provider.
- ___ a. In the “JDBC providers” section, click the **Derby JDBC Provider Non-XA** link.
- ___ b. Under **Additional Properties**, click **Data sources**.
- ___ c. Click **New**.
- ___ d. In the **JNDI name** field, enter `jdbc/ilogDataSource` and click **Next**.
- ___ e. Enter the path for the Decision Center database in the **Database name** field:
`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\databases\DCdb`
- ___ f. Clear the **Use this data source in container managed persistence (CMP)** check box.
- ___ g. Click **Next**.
- ___ h. Click **Next** to skip the “Setup security aliases” section.

- __ i. Review the summary information, and click **Finish**.

Summary	
Summary of actions:	
Options	Values
Scope	cells:odmHost1Node01Cell:nodes:odmHost1Node01:servers:server1
Data source name	Derby JDBC Driver DataSource
JNDI name	jdbc/ilogDataSource
Select an existing JDBC provider	Derby JDBC ProviderNon-XA
Implementation class name	org.apache.derby.jdbc.EmbeddedConnectionPoolDataSource
Database name	C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\AppSrv01\repositories\DCdb
Use this data source in container managed persistence (CMP)	false

- __ j. Click **Save** to save directly to the master configuration.

- __ 4. Define JAAS - J2C authentication data.

- __ a. Go to **Resources > JDBC > Data sources**.
- __ b. Click the **Derby JDBC Driver DataSource** link.
- __ c. In the **Related Items** section, click **JAAS - J2C authentication data**.
- __ d. Click **New**.
- __ e. In the General Properties section, enter the following values:

- **Alias:** RtsDerbyUser
- **User ID:** rtsAdminDB
- **Password:** rtsAdminDB

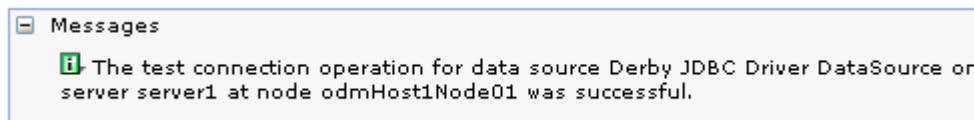
- __ f. Click **Apply**.
- __ g. Click **Save** to save directly to the master configuration.
- __ 5. Set the component-managed authentication and container-managed authentication aliases.
- __ a. Click the **Derby JDBC Driver DataSource** breadcrumb to return to the Derby JDBC Driver DataSource page.
- __ b. Scroll down to the “Security settings” section, and select the following values:
 - **Component-managed authentication alias:** odmHost1Node01/RtsDerbyUser
 - **Container-managed authentication alias:** odmHost1Node01/RtsDerbyUser
- __ c. Click **Apply**.
- __ d. Click **Save** to save directly to the master configuration.

-
- ___ 6. Define the **createDatabase** custom property to create.
 - ___ a. On the “Data sources” page, click the **Derby JDBC Driver DataSource** link.
 - ___ b. In the **Additional Properties** section, click **Custom properties**.
 - ___ c. Click **createDatabase**.
 - ___ d. Enter `create` in the **Value** field.

For a Derby data source, if you did not yet create the database, you can set the value of the `createDatabase` property to `create`. The database is created at the first database connection.

- ___ e. Click **Apply**.
 - ___ f. Click **Save** to save directly to the master configuration.
- ___ 7. Test the data source connection.
 - ___ a. Go back to the “Data sources” page by clicking the **Data sources** breadcrumb, and click the **Derby JDBC Driver DataSource** link.
 - ___ b. Click **Test connection**.

If the test connection is successful, you see a success message.



Section 2. Configuring user access

In this section, you create the user groups and roles for Decision Center.

2.1. Step 3: Defining user roles and groups

- __ 1. In the side pane of the administrative console, click **Users and Groups > Manage Groups**.



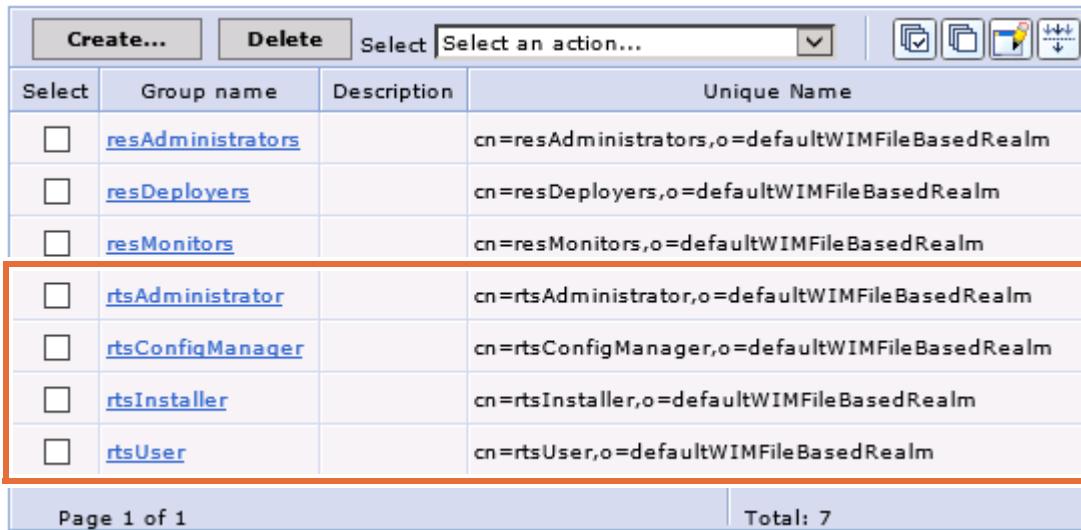
- __ 2. Create these user groups:

- rtsUser
- rtsAdministrator
- rtsConfigManager
- rtsInstaller

- __ a. Click **Create**.
- __ b. Enter **rtsUser** in the **Group name** field, and click **Create**.
- __ c. Click **Create Like** and create another group that is named: **rtsAdministrator**, and click **Create**.
- __ d. Repeat these steps to create two more groups:
 - rtsConfigManager
 - rtsInstaller
- __ e. After you create the last group, click **Close**.

Your list of groups should now include the following users:

- rtsAdministrator
- rtsConfigManager
- rtsInstaller
- rtsUser



The screenshot shows a software interface for managing users and groups. At the top, there are buttons for 'Create...', 'Delete', and a dropdown menu 'Select an action...'. Below this is a toolbar with icons for select, filter, and edit. The main area is a table with columns: 'Select', 'Group name', 'Description', and 'Unique Name'. There are 7 rows of data. The last four rows, which correspond to the 'rts...' groups listed in the previous section, are highlighted with a red box. The data in the table is as follows:

Select	Group name	Description	Unique Name
<input type="checkbox"/>	resAdministrators		cn=resAdministrators,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resDeployers		cn=resDeployers,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resMonitors		cn=resMonitors,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsAdministrator		cn=rtsAdministrator,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsConfigManager		cn=rtsConfigManager,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsInstaller		cn=rtsInstaller,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsUser		cn=rtsUser,o=defaultWIMFileBasedRealm

- 3. In the side pane, click **Users and Groups > Manage Users**.
- 4. Create the `rtsUser1` user role, which is the rule authoring business role.
- a. Click **Create**.
- b. Enter `rtsUser1` for the following fields:
- User ID
 - First name
 - Last name
 - Password
 - Confirm password



Note

Do not click **Create** yet.

- c. Click **Group Membership**, and click **Search**.
- d. Select the `rtsUser` group from the **Available** column, and click **Add**.
- e. Click **Close**.
- f. Click **Create**.
- g. Click **Close**.

The `rtsUser1` user role is now created and added to the `rtsUser` user group.

- ___ 5. Repeat Step 4 to create an administrative user role with these values:
- Name: rtsAdmin
 - Password: rtsAdmin
 - Groups: **rtsAdministrator** and **rtsInstaller**
- ___ 6. Create a user with a configuration manager role with these values:
- Name: rtsConfig
 - Password: rtsConfig
 - Group: **rtsConfigManager**

The Decision Center user roles are now created and assigned to the appropriate groups.

Select	User ID	First name	Last name	E-mail	Unique Name
<input type="checkbox"/>	odmAdmin_lab	odmAdmin_lab	odmAdmin_lab		uid=odmAdmin_lab,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resAdmin	resAdmin	resAdmin		uid=resAdmin,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resDeployer	resDeployer	resDeployer		uid=resDeployer,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	resMonitor	resMonitor	resMonitor		uid=resMonitor,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsAdmin	rtsAdmin	rtsAdmin		uid=rtsAdmin,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsConfig	rtsConfig	rtsConfig		uid=rtsConfig,o=defaultWIMFileBasedRealm
<input type="checkbox"/>	rtsUser1	rtsUser1	rtsUser1		uid=rtsUser1,o=defaultWIMFileBasedRealm

Page 1 of 1

Total: 7

- ___ 7. Log out and restart the application server so that the changes take effect.
- ___ a. Click **Logout**. (You can leave the browser open.)
- ___ b. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop the server**.
- It takes a moment to stop the server. After the server stops, the command prompt window disappears.
- ___ c. Click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Start the server**.
- It takes a moment to start the server again. After the server starts, the command prompt window disappears.

Section 3. Deploying the application

In this section, you deploy the configured Decision Center application.

3.1. Step 4: Deploying the Decision Center management EAR

Before you deploy the EAR file, you must declare your custom groups, if there are any, in the deployment descriptor.

You work with custom groups in Exercise 5, "Customizing user access and enforcing security in Decision Center".

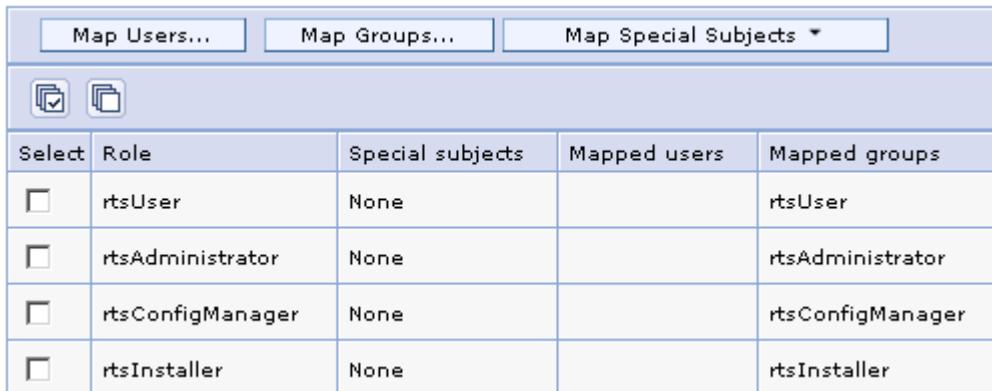
- ___ 1. Log on the WebSphere Integrated Solutions console with the `odmAdmin_lab` user name and password.
 - ___ a. Return to the WebSphere Integrated Solutions console.
 - ___ b. Enter `odmAdmin_lab` in the **User Name** and **Password** fields.
 - ___ c. Click **Log in**.
- ___ 2. Install the Decision Center management EAR file.
 - ___ a. In the side pane, click **Applications > New Application**, and click **New Enterprise Application**.
 - ___ b. In the "Path to the new application" section, select **Local file system**, and click **Browse** to go to the installation directory for Decision Center.

The default directory is:
`C:\Program Files\IBM\ODM871\ODM\teamserver\applicationservers\WebSphere85`
 - ___ c. Select `jrules-teamserver-WAS85.ear` and click **Open**.
 - ___ d. Click **Next**.

Opening the EAR file might take a few moments.
 - ___ e. In answer to the question "How do you want to install the application?" select **Detailed - Show all installation options and parameters**.
 - ___ f. Expand **Choose to generate default bindings and mappings** and select **Generate Default Bindings**.
 - ___ g. Click **Next**.
 - ___ h. Click **Continue** to accept the security warning.
- ___ 3. In Step 1, click **Next** to accept the default settings.
- ___ 4. Click **Next** for Steps 2 - 8. You can also skip these steps by clicking **Step 9: Map security roles to users or groups**.
- ___ 5. Map the `rtsUser` role to the `rtsUser` group.
 - ___ a. Select the **rtsUser** role check box.
 - ___ b. Click **Map groups**.

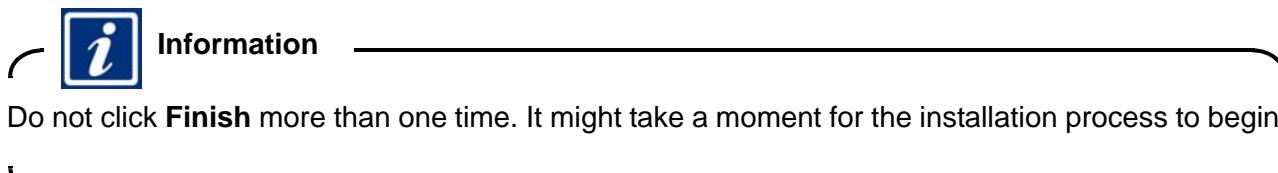
- ___ c. Click **Search**.
 The groups are shown in a column titled **Available**.
- ___ d. Click **rtsUser** in the **Available** column, and then click the arrow to move it to the **Selected** column.
- ___ e. Click **OK** to return to the “Mapping Users to Roles” page.
- ___ 6. Repeat the previous steps to map the roles of **rtsAdministrator**, **rtsConfigManager**, and **rtsInstaller** for the other groups.

The application roles should now be mapped to the groups you defined.



Select	Role	Special subjects	Mapped users	Mapped groups
<input type="checkbox"/>	rtsUser	None		rtsUser
<input type="checkbox"/>	rtsAdministrator	None		rtsAdministrator
<input type="checkbox"/>	rtsConfigManager	None		rtsConfigManager
<input type="checkbox"/>	rtsInstaller	None		rtsInstaller

- ___ 7. After mapping, click **Next** and click **Next** for Steps 10 and 11 or you can click **Step 12**.
 ___ 8. On Step 12, review the summary and click **Finish**.



- ___ 9. After the installation is complete, click **Manage Applications** at the bottom of the pane.

ADMA5013i: Application ILOG Rule Team Server installed successfully.

Application ILOG Rule Team Server installed successfully.

To start the application, first save changes to the master configuration.

Changes have been made to your local configuration. You can:

- [Save](#) directly to the master configuration.
- [Review](#) changes before saving or discarding.

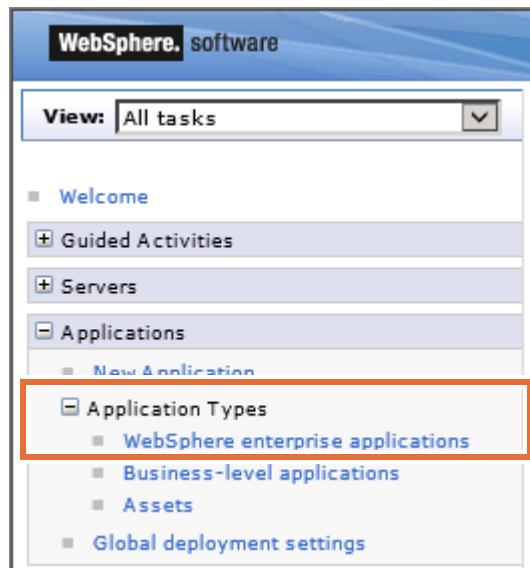
To work with installed applications, click the “Manage Applications” link.

[Manage Applications](#)

- ___ 10. Configure the Decision Center modules.
- ___ a. Click **ILOG Rule Team Server**.
 - ___ b. Under **Modules**, click **Manage Modules**.
 - ___ c. Click **teamserver**.
 - ___ d. Under **General Properties**, set **Class loader order** to **Classes loaded with local class loader first (parent last)**.
 - ___ e. Click **OK**.
 - ___ f. Click **decisioncenter**.
 - ___ g. Under **General Properties**, set **Class loader order** to **Classes loaded with local class loader first (parent last)**.
 - ___ h. Click **OK**.
 - ___ i. Click **Save** to save directly to the master configuration.

3.2. Starting the Decision Center application

- ___ 1. Start the ILOG Rule Team Server enterprise application.
- ___ a. In the side pane, click **Applications > Application Types > WebSphere enterprise applications**.



- ___ b. On the Enterprise Applications page, select the **ILOG Rule Team Server** check box, and click **Start** to start the application.

If the application starts successfully, you see a green arrow in the Application Status column, and the following message:

Application ILOG Rule Team Server on server server1 and node odmHost1Node01 started successfully. The collection may need to be refreshed to show the current status.

The screenshot shows the 'Enterprise Applications' interface. At the top, there is a 'Messages' section containing a single message: 'Application ILOG Rule Team Server on server server1 and node odmHost1Node01 started successfully. The collection may need to be refreshed to show the current status.' Below this is a 'Enterprise Applications' section with a sub-section 'Preferences'. A toolbar at the top has buttons for Start, Stop, Install, Uninstall, Update, Rollout Update, Remove File, Export, and Export DI. Below the toolbar is a toolbar with icons for selecting, adding, and deleting. A table follows, with columns for Select, Name, and Application Status. The table lists five applications: DefaultApplication, ILOG Rule Execution Server, ILOG Rule Team Server, ivtApp, and query. The 'ILOG Rule Team Server' row is highlighted with an orange border. The 'Total 5' row is also highlighted with an orange border.

Select	Name	Application Status
<input type="checkbox"/>	DefaultApplication	
<input type="checkbox"/>	ILOG Rule Execution Server	
<input type="checkbox"/>	ILOG Rule Team Server	
<input type="checkbox"/>	ivtApp	
<input type="checkbox"/>	query	
Total 5		

- 2. Close the administrative console.

Section 4. Post-deployment configuration steps

In this section, you configure the deployed Decision Center application.

4.1. Step 5: Verifying the deployment of the Decision Center Enterprise console

- 1. Sign in to Decision Center with the `rtsAdmin` user ID and password.
- a. Enter the following URL in a web browser to access the Decision Center Enterprise console:

`http://localhost:9081/teamserver`



Important

Make sure that you are using the correct port for your environment.



Note

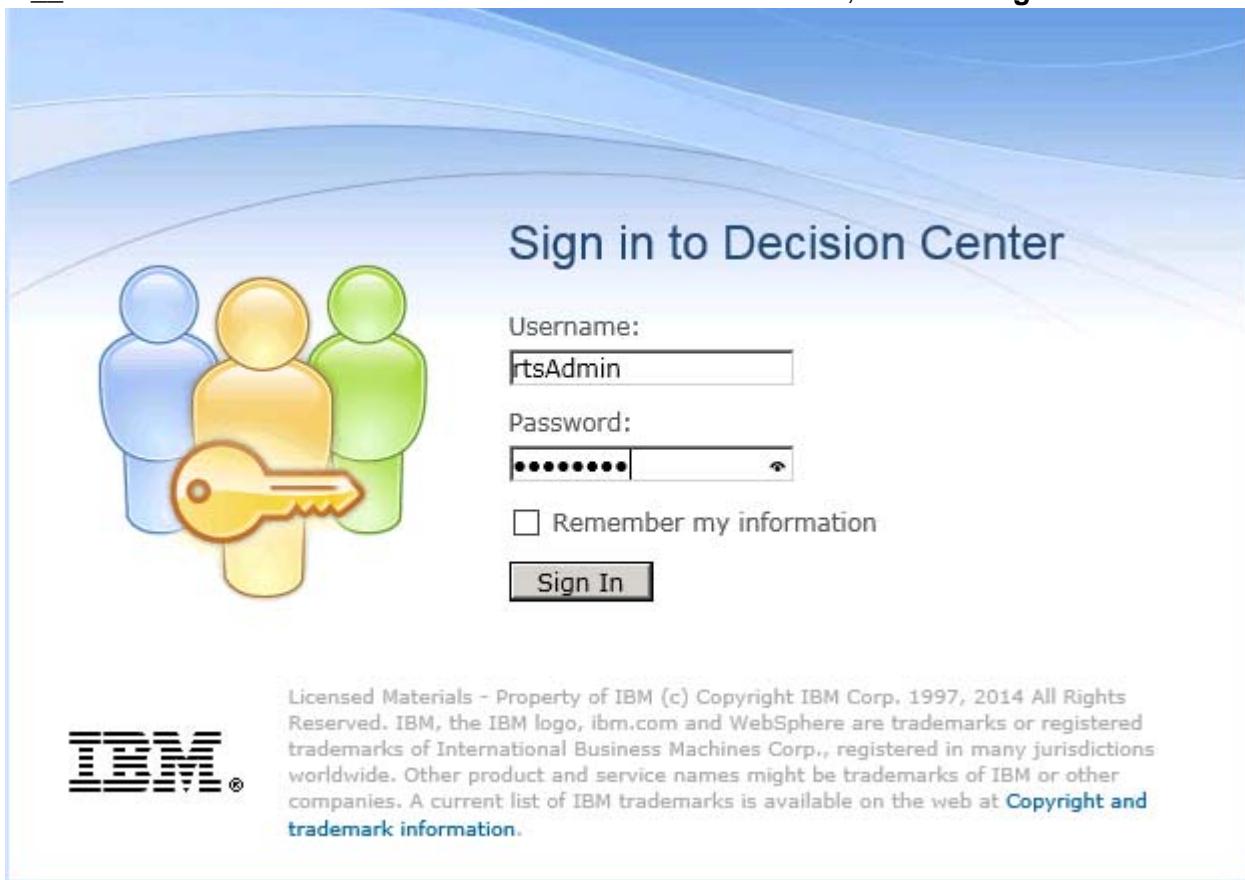
If you see a privacy message about cookies, click **Agree and Proceed**.

Privacy

Cookies are important to the proper functioning of a site. To improve your experience, we use cookies to remember log-in details, provide secure log-in and deliver content tailored to your interests. Click Agree and Proceed to accept cookies and go directly to the site.

Agree and Proceed

- __ b. Enter rtsAdmin in the **Username** and **Password** fields, and click **Sign In**.



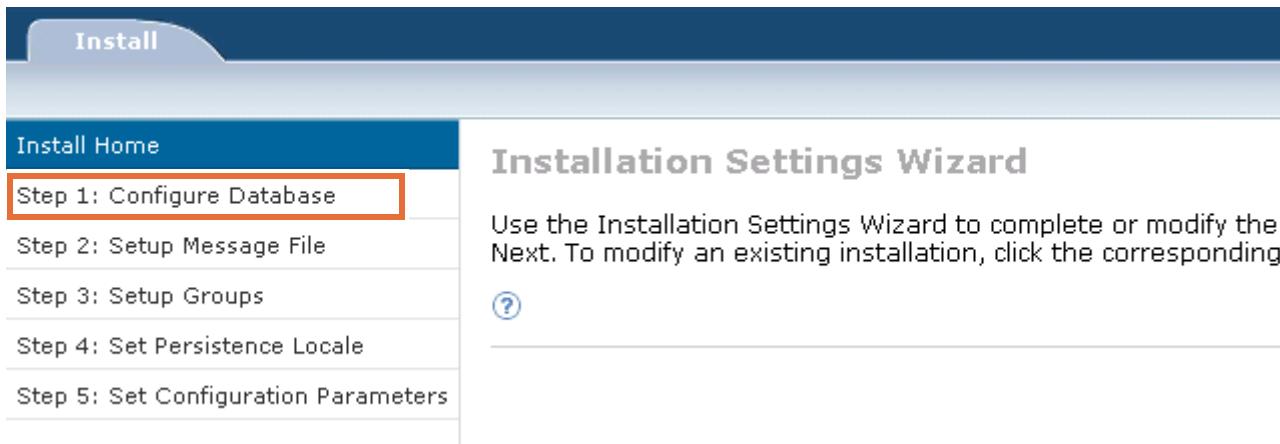
The image shows the 'Sign in to Decision Center' page. It features a logo of three stylized human figures (blue, yellow, green) surrounding a large yellow key icon. The page has fields for 'Username' (containing 'rtsAdmin') and 'Password' (containing '*****'). There is a checkbox for 'Remember my information' and a 'Sign In' button. At the bottom left is the IBM logo, and at the bottom right is a copyright notice: 'Licensed Materials - Property of IBM (c) Copyright IBM Corp. 1997, 2014 All Rights Reserved. IBM, the IBM logo, ibm.com and WebSphere are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the web at [Copyright and trademark information](#)'.

4.2. Step 6: Completing the installation of Decision Center

You can work from the Decision Center Enterprise console to complete or modify the configuration after you deploy the Decision Center archive to your application server. You use the Installation Settings wizard in the Decision Center console to create or modify the database schema, set up message files or groups, or change the persistence locale or configuration parameters.

The Installation Settings wizard opens automatically when you start the Decision Center console to complete the installation.

- __ 1. Click **Next** to go to the "Step 1: Configure Database" page.



The image shows the 'Installation Settings Wizard' interface. On the left is a sidebar with steps: 'Install Home' (selected), 'Step 1: Configure Database' (highlighted with a red border), 'Step 2: Setup Message File', 'Step 3: Setup Groups', 'Step 4: Set Persistence Locale', and 'Step 5: Set Configuration Parameters'. The main area is titled 'Installation Settings Wizard' and contains the text: 'Use the Installation Settings Wizard to complete or modify the installation. Click Next. To modify an existing installation, click the corresponding link.' Below this is a question mark icon.

- ___ 2. In Step 1, generate the SQL script that creates the database tables according to the contents of your rule model files, and execute it.
 - ___ a. Confirm that the **Default extensions** option is selected, and click **Generate SQL** to generate the script.

Configure the Decision Center database

Configure the Decision Center database by first generating the SQL script that creates the database schema extensions you specify, then executing the script and initializing the database.

Select the extension files you want to use:

<input checked="" type="radio"/> Default extensions	<input type="radio"/> Custom extensions (brmx/brdx)	<input type="radio"/> Custom extensions (Zip)
Generate SQL		

- ___ b. After you generate the script, make sure that **Execute the SQL script** is selected and click **Next**.

It takes a moment to execute the SQL script.

Please wait

 Executing SQL statement: 'CREATE TABLE
RTSADMINDB.NAMEDCONSTANTTYPE (VALUE VARCHAR(30) NOT NULL,
PRIMARY ...: 206 / 764

Cancel



Troubleshooting

If the SQL execution fails, restart the server for AppSrv01 and rerun the Installation Settings wizard.

After the SQL script executes successfully, the wizard takes you to the “Step 2: Setup Message File” page.

Step 2: Set up message files

Message files contain the display text that is associated with the extensions to the rule model.

- ___ 3. Click **Next** to go to the “Step 3: Setup Groups” page.

Step 3: Setup Groups

In addition to creating groups in your application server when you set up security access, you must use the Setup Groups page in the Installation Settings wizard to upload groups to the database.

**Information**

You do this step in Exercise 5, "Customizing user access and enforcing security in Decision Center".

- ___ 4. Click **Next** to go to the "Step 4: Set Persistence Locale" page.

Step 4: Set Persistence Locale

The persistence locale determines the language in which you store rules in the Decision Center database. You set the locale when you deploy the Decision Center EAR file to your application server. As a consequence, you store the rules in the database in the locale of the Decision Center application.

Changing the persistence locale does not change the language in which Decision Center displays rules. Changing it in Decision Center is necessary only to match the locale of Rule Designer when synchronizing your rule projects.

Since the default locale is English, you do not need to take any further action at this step.

- ___ 5. Click **Next** to go the "Step 5: Set Configuration Parameters" page.

Step 5: Set Configuration Parameters

This step is optional. Many tasks that are related to customizing Decision Center require that you set or change configuration parameters.

You do not take any further action at this step.

- ___ 6. Click **Finish**.

- ___ 7. After reviewing the installation log, which shows the message that you performed database management, click **OK**.

You should be logged out automatically. Otherwise, you can click **Logout**.

- ___ 8. Sign back in to the Decision Center Enterprise console again with the `rtsAdmin` user name and password.

- ___ a. Enter `rtsAdmin` in the **Username** and **Password** fields.
___ b. Click **Sign In**.

**Information**

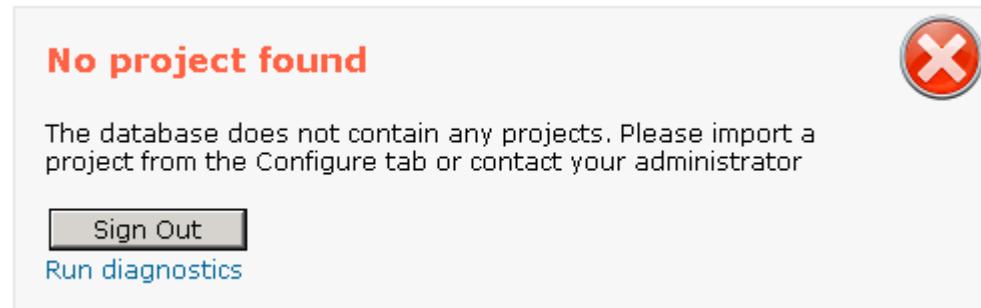
You can ignore the warning that the database does not contain any projects.

- ___ 9. Click the **Configure** tab.

- ___ c. Select **Installation Settings Wizard**.
___ d. Click **Step 5: Set Configuration Parameters**

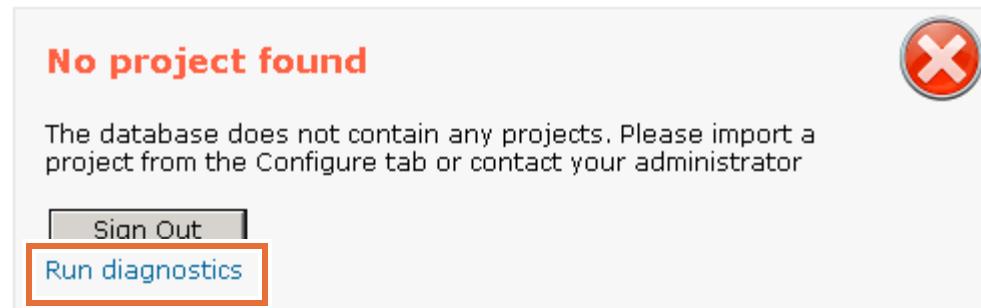
No configuration parameters require changes.

- ___ e. Click **Exit**.
- ___ f. On the “Installation log” page, click **OK** to return to the home page.
No project is found.



You configured the Decision Center successfully. However, it does not contain any projects. You learn how to import projects during Exercise 6, "Synchronizing across business and development environments".

- ___ 10. Run the diagnostic tools.
 - ___ a. Click the **Run diagnostics** link at the bottom of the “No project found” window.



- ___ b. After the diagnostic checks are complete, click **Expand All** to review the results.

The screenshot shows the 'Diagnostics' section of the IBM WebSphere Application Server Network Deployment V8.5.5 interface. At the top, there is a 'Configure' button. Below it, the 'Diagnostics' section has a header with 'Expand All' and 'Collapse All' buttons. The 'About' section is expanded, displaying the following information:

Product Version	Decision Center 8.7.1.0
Patch level	1-20150417-102145 COMMERCIAL
EAR build date	April 17, 2015 7:15:45 PM

Other collapsed sections include 'Manager Bean Access', 'Data source', and 'Extensions'. The 'Manager Bean Access' section shows 'Manager Bean creation test' and 'Server connection test' both passed. The 'Data source' section lists database details like name (jdbc/ilogDataSource), schema version (JRules 8.6), and information (Apache Derby 10.8.3.1 - (1452645)). The 'Extensions' section lists model and data extensions, along with the controller class (ilog.rules.teamserver.model.IlrDefaultSessionController).

- ___ c. When you are done reviewing the results, click **Sign Out** and close the browser.
- ___ 11. Stop the server for this profile by clicking **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop the server.**

End of exercise

Exercise review and wrap-up

This exercise looked at how to manually configure Decision Center on WebSphere Application Server.

Exercise 4. Using a profile template to configure Rule Execution Server

What this exercise is about

This exercise covers how to automatically configure a new instance of Rule Execution Server on a new profile by using a profile template.

What you should be able to do

After completing this exercise, you should be able to:

- Configure Rule Execution Server on a new profile by using the profile template

Introduction

This exercise describes how to use the profile template that is provided with the ODM installation.

In Exercise 2, you went through the configuration process manually, which is not practical when working with a cluster.

Requirements

Make sure that you complete Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server" before working on this exercise.

Section 1. Configuring a profile with a Rule Execution Server profile template

You can create profiles for Rule Execution Server and configure a WebSphere Application Server cluster for high availability and scalability. To create a stand-alone server to host Rule Execution Server, you must first create a profile. You can create a profile with the Profile Management Tool.

When you install Decision Server, the installer copies files for cluster configuration to the directory for shared profiles and to the WebSphere Application Server directory for profile templates.

In this section, you create a profile by using the profile template. However, the configuration of a WebSphere Application Server cluster for high availability and scalability is not covered in this course.

1.1. Stopping the servers

Before creating a Decision Server Rules profile for Rule Execution Server, make sure that no other application server is running.

- 1. To stop the AppSrv01 server, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop the server.**
It takes a few moments to stop the server.
- 2. Close any open browsers.

1.2. Using the Profile Management Tool

- 1. To start the Profile Management tool, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Tools > Profile Management Tool.**

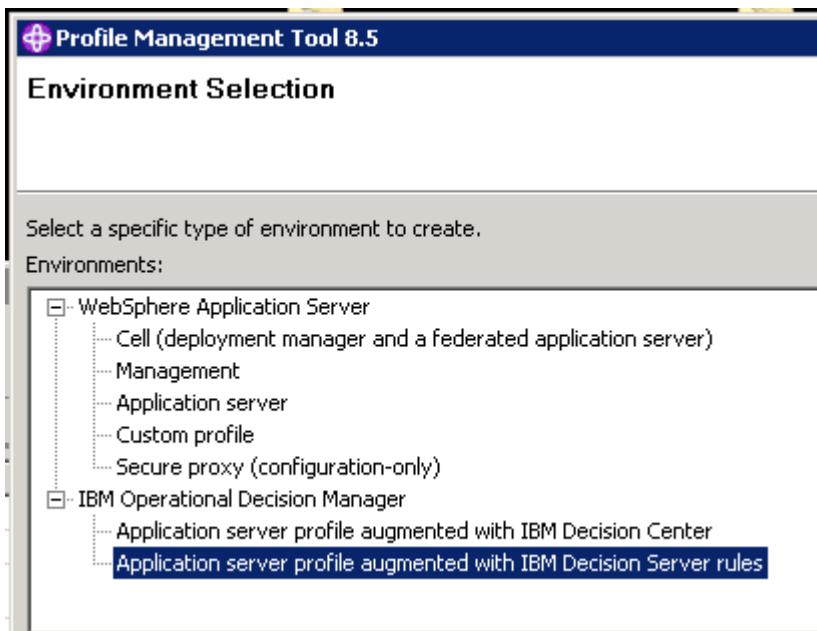


Note

During profile creation, you are asked to select the database manager that hosts the tables for the execution server run time. You must create the database before you configure a new profile. In this class image, a Derby database is already created. You do not create any database in this lab exercise.

- 2. Create a profile for IBM Operational Decision Manager.
 - a. Click **Create** to create a profile.
 - b. On the Environment page, expand **IBM Operational Decision Manager**.

- ___ c. Select **Application server profile augmented with IBM Decision Server rules** and click **Next**.



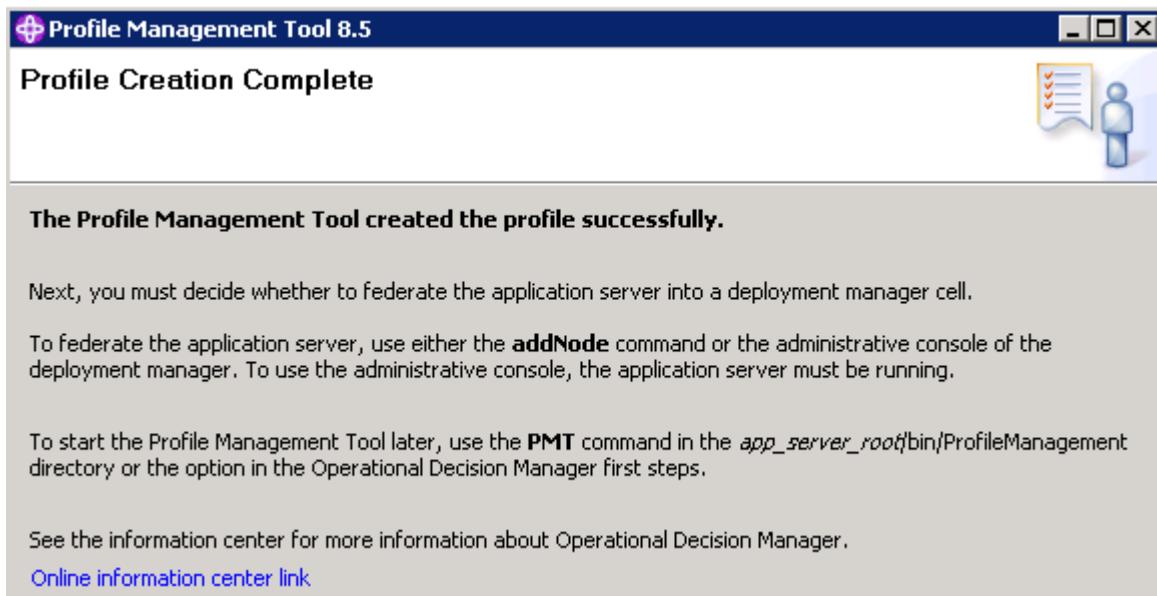
- ___ d. On the Profile Creation Options page, select **Typical profile creation**, and click **Next**.
- ___ 3. Define the business rules installation location.
- ___ a. On the Operational Decision Manager Business Rules Installation Location page, make sure that the path points to the following directory:
- ```
C:\Program Files\IBM\ODM871\ODM
```
- \_\_\_ b. Click **Next**.
- \_\_\_ 4. Enable administrative security.
- \_\_\_ a. On the Administrative Security page, make sure that **Enable administrative security** is selected and enter the following information (case sensitive):
- **User name:** resAdmin\_lab
  - **Password:** resAdmin\_lab
  - **Confirm password:** resAdmin\_lab
- \_\_\_ b. Click **Next**.
- \_\_\_ 5. On the Database Configuration page, verify that the **Embedded IBM Apache Derby** is selected, and click **Next**.



During profile creation, you are asked to select the database manager that hosts the tables for the execution server run time. You must create the database before you configure a profile. In this class image, a Derby database is already created. You do not need to create any database in this lab exercise.

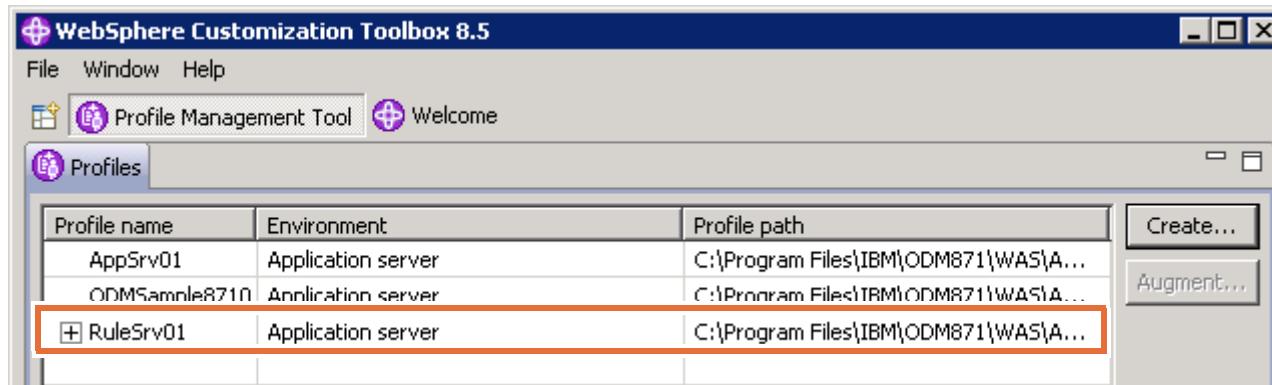
6. On the **Profile Creation Summary** page, review the information and click **Create**.

It takes several minutes to create the profile, and you see the new profile on the tool.



7. Click **Finish**.

Your new Decision Server rules profile is now listed in the Profile Management Tool.



8. Close the Profile Management Tool (**File > Exit**).

### 1.3. Verifying the configuration

1. To start the server of the RuleSrv01 profile, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > RuleSrv01 > Start the server**.



#### Important

Make sure that you select the correct profile.

It takes a moment to start the server.

After the server starts, the command prompt window disappears.

- 2. Log in to the Rule Execution Server console.
  - a. Open the Rule Execution Server console in a browser by typing the following URL:  
`http://localhost:9082/res`

**Important**

Make sure that you use the correct port for your environment.

- b. Enter `resAdmin_lab` in the **User Name** and **Password** fields, and click **Sign In**.

Sign in to the Rule Execution Server console

User Name  
`resAdmin_lab`

Password  
\*\*\*\*\*

Sign In

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After you log in to the Rule Execution Server console, the Installation Settings wizard opens, which confirms that Rule Execution Server was correctly configured on your new profile.

The screenshot shows the IBM Rule Execution Server console interface. At the top, there's a header bar with the IBM logo, the text "Rule Execution Server console", a "Skip to main content" link, a user icon labeled "resAdmin\_lab", and "Sign Out". Below the header is a navigation bar with links for "About", "Print View", and "Help". The main content area has a title "Installation Settings Wizard" and a "Help" link with a question mark icon. A section titled "RuleApps persistence details" contains the following configuration information:

| Setting                  | Value                                                                                         |
|--------------------------|-----------------------------------------------------------------------------------------------|
| Database Product Name    | Apache Derby                                                                                  |
| Database Product Version | 10.8.3.1 - (1452645)                                                                          |
| Driver Name              | Apache Derby Embedded JDBC Driver                                                             |
| Driver Product Version   | 10.8.3.1 - (1452645)                                                                          |
| JDBC URL                 | jdbc:derby:C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\RuleSrv01\databases/derby/resdb |
| Schemas                  | APP, NULLID, SQLJ, SYS, SYSCAT, SYSCS_DIAG, SYSCS_UTIL, SYSFUN, SYSIBM, SYSPROC, SYSSTAT      |
| Username                 | derbyadmin                                                                                    |

- \_\_\_ 3. Click **Sign out** to exit.
- \_\_\_ 4. Close the browser.
- \_\_\_ 5. Stop the server for this profile by clicking **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > RuleSrv01 > Stop the server.**

## End of exercise

## Exercise review and wrap-up

This exercise covered automatic configuration of Rule Execution Server on a new profile by using a profile template.



# Exercise 5. Customizing user access and enforcing security in Decision Center

## What this exercise is about

This exercise teaches you how to customize user access by defining user groups and roles. You also learn how to enforce security in Decision Center by defining fine-grained permissions on rule artifacts within a rule project.

## What you should be able to do

After completing this exercise, you should be able to:

- Set up custom groups and user roles
- Enforce security in Decision Center by specifying fine-grained permissions on Decision Center projects

## Introduction

As an administrator, you manage security and user access for business users to the Decision Center consoles. In this exercise, you learn how to set up custom groups on the application server, add those groups to the Decision Center deployment descriptors, and redeploy the Decision Center application. You also learn how to manage the custom groups in the Decision Center Enterprise console and enforce security on a project.

This exercise includes several tasks that are applicable to both business rules and business events.

This exercise includes these sections:

- Section 1, "Viewing permissions for default groups"
- Section 2, "Configuring security on WebSphere Application Server"
- Section 3, "Creating custom user groups in WebSphere Application Server"
- Section 4, "Creating custom users"
- Section 5, "Redeploying the Decision Center EAR with the customized permissions"
- Section 6, "Adding custom groups to Decision Center"
- Section 7, "Specifying fine-grained permissions"
- Section 8, "Viewing effective permissions"
- Section 9, "Enforcing security on a project"
- Section 10, "Managing access to servers"

## Requirements

This exercise requires you to work in the WebSphere Application Server administrative console and in Decision Center.

## Section 1. Viewing permissions for default groups

- 1. If the sample server is not already started, go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server** or use the **Start Server** desktop shortcut.



### Warning

In Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server", you created a separate application server profile. For this exercise, you work with the sample server for the ODMSample8710 profile that is delivered with the product.

Make sure that you use the correct **Start** menu item and local host ports that are provided in the instructions.

- 2. Open Decision Center Enterprise console by double-clicking the Decision Center Enterprise console desktop shortcut or by entering the following URL in a browser:

`http://localhost:9080/teamserver`



### Information

You can also open the Decision Center console from the Start menu by clicking **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Decision Center Enterprise Console**.

The following table lists some of the user groups that are defined for Decision Center. You can sign in as a member of each of the following groups.

|                  | <b>Author</b> | <b>Configure</b> | <b>Administer</b> |
|------------------|---------------|------------------|-------------------|
| <b>User name</b> | rtsUser1      | rtsConfig        | rtsAdmin          |
| <b>Password</b>  | rtsUser1      | rtsConfig        | rtsAdmin          |

- 3. Sign in to Enterprise console with rule author permissions to see which tabs are available to business users.
- **User name:** rtsUser1
  - **Password:** rtsUser1
- 4. Notice that the **Configure** tab is not available.



- 5. Sign out and sign in again with configuration permissions.

- **User name:** rtsConfig
- **Password:** rtsConfig

The **Configure** tab is now available.



The **Configure** tab shows different options, depending on whether you're working on a classic rule project or a decision service.

- \_\_\_ 6. View the configuration options for the `loanvalidation-rules` rule project.
  - \_\_\_ a. On the **Home** tab, select **Work on a rule project** and make sure that **loanvalidation-rules** is selected from the **Project in use** menu.
  - \_\_\_ b. Click the **Configure** tab to view the menu options on this tab.

## Configure

### Deployment

- [Edit Ruleset Extractors](#)  
View and edit the list of extractors used to generate rulesets
- [Manage RuleApps](#)  
Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server
- [Manage Servers](#)  
Create, delete, and edit the servers on which you deploy your projects

- \_\_\_ 7. Sign out and sign in again with administrator permissions.
  - **User name:** rtsAdmin
  - **Password:** rtsAdmin

The same tabs are available for administrator and configure permissions, but more tasks are available for administrators on the **Configure** tab.
- \_\_\_ 8. View the **Configure** tab for a rule project.
  - \_\_\_ a. On the **Home** tab, make sure that **Work on a rule project** is selected, and that **loanvalidation-rules** is selected from the **Project in use** menu.
  - \_\_\_ b. Click the **Configure** tab to see which menu options are now available.

As an administrator, you might work with business analysts to help set up management features that are available from this **Configure** tab, including management of permissions and creating custom user roles and groups.

You work with customizing user access next.

## Section 2. Configuring security on WebSphere Application Server

In this section, you configure a federated user repository as the active user registry in the WebSphere Application Server Integrated Solutions console, and create groups and a user.

### 2.1. Configuring a federated repository

- 1. Open the WebSphere Application Server console for the sample server.
  - a. If the sample server is not already started, go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Administrative console**.
  - b. If prompted with a security warning, follow the browser instructions to continue to the website.



#### Note

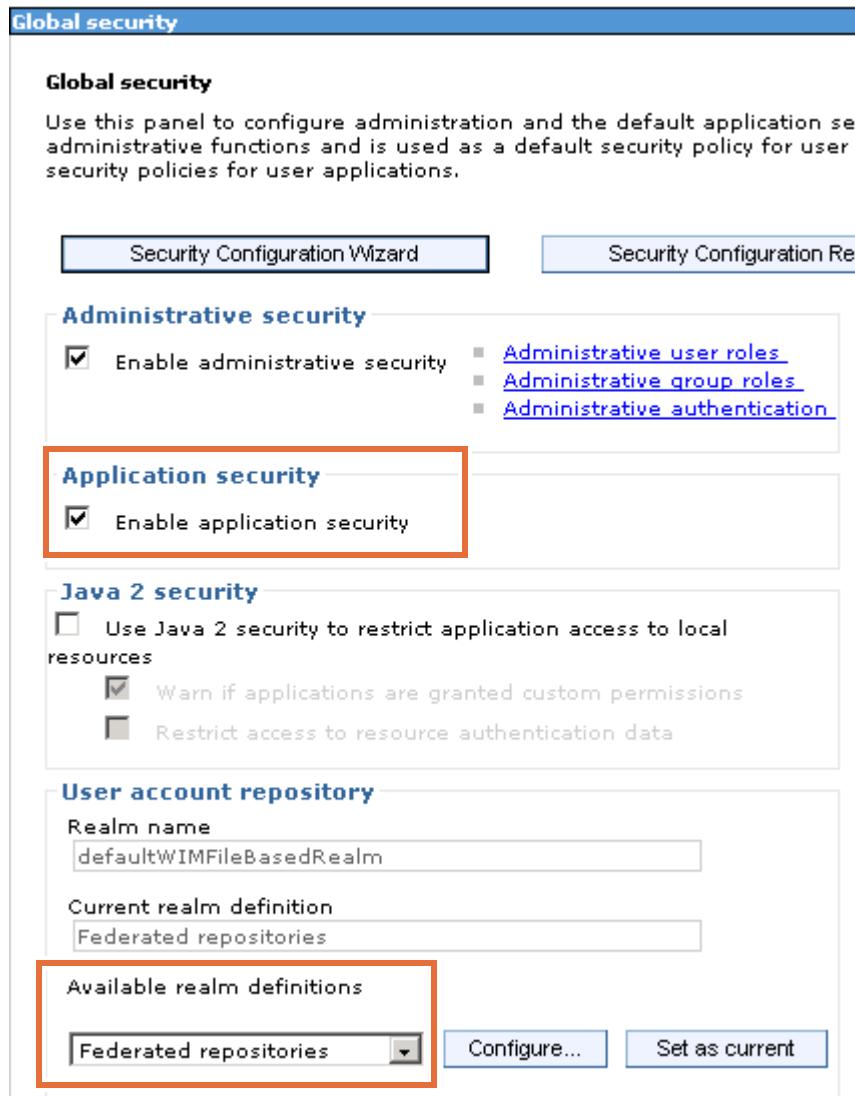
If you see a JSP processing error message, you can ignore it.

- c. Sign in with `odm` as the user name and password.
- 2. In the side pane, click **Security > Global security**.



You see the configuration options for the repository security. In the “Application security” section, you see that **Enable application security** is selected. You also see, in the

“Available realm definitions” section, that the **Federated repositories** option is already selected.



- 3. Click **Security Configuration Wizard** to explore the wizard options that you set if **Federated repositories** was not already selected.

**Global security**  
Use this panel to configure administration and the default application se administrative functions and is used as a default security policy for user security policies for user applications.

Security Configuration Wizard

**Warning**

You do not have to change any values in the wizard. This step is to explore the wizard only.

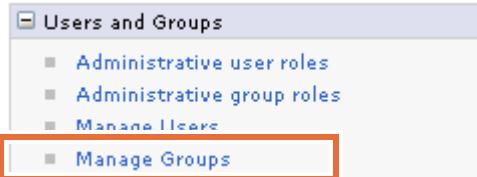
- \_\_ a. In Step 1, notice that **Enable application security** is selected to specify the level of protection, and click **Next**.
- \_\_ b. In Step 2, notice that **Federated repositories** is selected, and click **Next**.
- \_\_ c. In Step 3, notice that `odm` is in the **Primary administrative user name** field. You can enter `odm` in the **Password** field and the **Confirm Password** field, and then click **Next**.
- \_\_ d. In Step 4, review the security configuration summary and click **Cancel**.

**Important**

When you change security options on the application server, make sure that you restart WebSphere Application Server by stopping the server and restarting it. You then sign in to the console again as the primary administrative user before continuing with the next steps.

## Section 3. Creating custom user groups in WebSphere Application Server

- 1. If you closed the WebSphere Application Server console, reopen it and sign in with `odm` as the user name and password.
- 2. In the side pane, click **Users and Groups > Manage Groups**.



The Manage Groups page opens, and you see the list of existing groups that are defined for Rule Execution Server and Decision Center. From this page, you can create and delete groups.

| Select                   | Group name                        | Description      | Unique Name                                                  |
|--------------------------|-----------------------------------|------------------|--------------------------------------------------------------|
| <input type="checkbox"/> | <a href="#">Eligibility</a>       | Eligibility      | <code>cn=Eligibility,o=defaultWIMFileBasedRealm</code>       |
| <input type="checkbox"/> | <a href="#">Validator</a>         | Validator        | <code>cn=Validator,o=defaultWIMFileBasedRealm</code>         |
| <input type="checkbox"/> | <a href="#">admin</a>             | manager          | <code>cn=admin,o=defaultWIMFileBasedRealm</code>             |
| <input type="checkbox"/> | <a href="#">administrator</a>     | administrator    | <code>cn=administrator,o=defaultWIMFileBasedRealm</code>     |
| <input type="checkbox"/> | <a href="#">author</a>            | author           | <code>cn=author,o=defaultWIMFileBasedRealm</code>            |
| <input type="checkbox"/> | <a href="#">definedGroup</a>      | defined group    | <code>cn=definedGroup,o=defaultWIMFileBasedRealm</code>      |
| <input type="checkbox"/> | <a href="#">deployedGroup</a>     | deployed group   | <code>cn=deployedGroup,o=defaultWIMFileBasedRealm</code>     |
| <input type="checkbox"/> | <a href="#">deployer</a>          | deployer         | <code>cn=deployer,o=defaultWIMFileBasedRealm</code>          |
| <input type="checkbox"/> | <a href="#">deprecatedGroup</a>   | deprecated group | <code>cn=deprecatedGroup,o=defaultWIMFileBasedRealm</code>   |
| <input type="checkbox"/> | <a href="#">inactiveGroup</a>     | inactive group   | <code>cn=inactiveGroup,o=defaultWIMFileBasedRealm</code>     |
| <input type="checkbox"/> | <a href="#">newGroup</a>          | new group        | <code>cn=newGroup,o=defaultWIMFileBasedRealm</code>          |
| <input type="checkbox"/> | <a href="#">refusedGroup</a>      | refused group    | <code>cn=refusedGroup,o=defaultWIMFileBasedRealm</code>      |
| <input type="checkbox"/> | <a href="#">resAdministrators</a> | RES Admin Group  | <code>cn=resAdministrators,o=defaultWIMFileBasedRealm</code> |

- \_\_\_ 3. Create a group that is called: myGroup
- \_\_\_ a. Click **Create** to open the “Create a Group” page.

- \_\_\_ b. In the **Group name** field, type a name for your group: myGroup
- \_\_\_ c. In the **Description** field, type a description for your group, such as:  
My custom group
- \_\_\_ d. Click **Create**.

When your group is created, you can create another similar group by clicking **Create Like**.

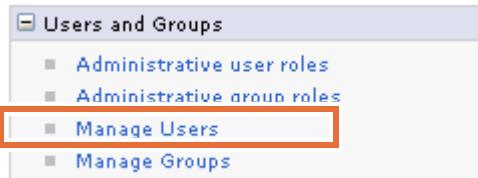


- \_\_\_ 4. Create another group that is called myTestGroup, and then click **Close**.

Your new groups are now listed in the table of groups.

## Section 4. Creating custom users

1. In the side pane, click **Users and Groups > Manage Users**.



The Manage Users page opens, and you see the list of existing users that are defined for Rule Execution Server and Decision Center. For example, you see `resAdmin`, which is a user role that you use during this course.

You can also create and delete users from this page.

The screenshot shows the 'Manage Users' page with a search interface at the top. Below it, a table lists 21 users. The 'Create...' and 'Delete' buttons are highlighted with a red box. The 'resAdmin' user row is also highlighted with a red box.

| Select                   | User ID                     | First name  | Last name   | E-mail | Unique Name                                |
|--------------------------|-----------------------------|-------------|-------------|--------|--------------------------------------------|
| <input type="checkbox"/> | <a href="#">Abu</a>         | Abu         | Abu         |        | uid=Abu,o=defaultWIMFileBasedRealm         |
| <input type="checkbox"/> | <a href="#">Bea</a>         | Bea         | Bea         |        | uid=Bea,o=defaultWIMFileBasedRealm         |
| <input type="checkbox"/> | <a href="#">Eli</a>         | Eli         | Eli         |        | uid=Eli,o=defaultWIMFileBasedRealm         |
| <input type="checkbox"/> | <a href="#">Paul</a>        | Paul        | Paul        |        | uid=Paul,o=defaultWIMFileBasedRealm        |
| <input type="checkbox"/> | <a href="#">Val</a>         | Val         | Val         |        | uid=Val,o=defaultWIMFileBasedRealm         |
| <input type="checkbox"/> | <a href="#">admUser</a>     | admUser     | admUser     |        | uid=admUser,o=defaultWIMFileBasedRealm     |
| <input type="checkbox"/> | <a href="#">admin</a>       | admin       | admin       |        | uid=admin,o=defaultWIMFileBasedRealm       |
| <input type="checkbox"/> | <a href="#">autUser</a>     | autUser     | autUser     |        | uid=autUser,o=defaultWIMFileBasedRealm     |
| <input type="checkbox"/> | <a href="#">depUser</a>     | depUser     | depUser     |        | uid=depUser,o=defaultWIMFileBasedRealm     |
| <input type="checkbox"/> | <a href="#">odm</a>         | odm         | odm         |        | uid=odm,o=defaultWIMFileBasedRealm         |
| <input type="checkbox"/> | <a href="#">resAdmin</a>    | resAdmin    | resAdmin    |        | uid=resAdmin,o=defaultWIMFileBasedRealm    |
| <input type="checkbox"/> | <a href="#">resDeployer</a> | resDeployer | resDeployer |        | uid=resDeployer,o=defaultWIMFileBasedRealm |
| <input type="checkbox"/> | <a href="#">resMonitor</a>  | resMonitor  | resMonitor  |        | uid=resMonitor,o=defaultWIMFileBasedRealm  |
| <input type="checkbox"/> | <a href="#">revUser</a>     | revUser     | revUser     |        | uid=revUser,o=defaultWIMFileBasedRealm     |

2. View the properties for the rtsAdmin user.
- a. In the **Search for** field, enter `rts*` and click **Search**.

Manage Users

Search for Users

Search by \* Search for \* Maximum results  
User ID rts\* 100

**Search**

The search results return four users that contain the string `rts` in the user name.

4 users matched the search criteria.

| Select                   | User ID                       | First name    | Last name     | E-mail | Unique Name                                  |
|--------------------------|-------------------------------|---------------|---------------|--------|----------------------------------------------|
| <input type="checkbox"/> | <a href="#">rtsAdmin</a>      | rtsAdmin      | rtsAdmin      |        | uid=rtsAdmin,o=defaultWIMFileBasedRealm      |
| <input type="checkbox"/> | <a href="#">rtsConfig</a>     | rtsConfig     | rtsConfig     |        | uid=rtsConfig,o=defaultWIMFileBasedRealm     |
| <input type="checkbox"/> | <a href="#">rtsUser1</a>      | rtsUser1      | rtsUser1      |        | uid=rtsUser1,o=defaultWIMFileBasedRealm      |
| <input type="checkbox"/> | <a href="#">rtsUser1Proj1</a> | rtsUser1Proj1 | rtsUser1Proj1 |        | uid=rtsUser1Proj1,o=defaultWIMFileBasedRealm |

Page 1 of 1 Total: 4

- b. Click **rtsAdmin** to see the user properties.
- On the **General** tab, you see identification properties.

User Properties

General Groups

\* User ID  
rtsAdmin

\* First name  
rtsAdmin

\* Last name  
rtsAdmin

E-mail

Password Confirm password

OK Apply Cancel

- On the **Groups** tab, you see that you can add or remove a user from an existing group.

User Properties

**General** **Groups**

User ID  
rtsAdmin

The user is a member of 3 groups.

| Add...                   | Remove           |  |  |  |
|--------------------------|------------------|--|--|--|
| Select                   | Group name       |  |  |  |
| <input type="checkbox"/> | rtsAdministrator |  |  |  |
| <input type="checkbox"/> | rtsInstaller     |  |  |  |
| <input type="checkbox"/> | rtsUser          |  |  |  |

Page 1 of 1 Total: 3

- \_\_\_ 3. Click the **General** tab and click **Cancel** to return to Manage Users page.
- \_\_\_ 4. Create a user for your new group.
  - \_\_\_ a. Click **Create** to create a custom user.
  - \_\_\_ b. Enter myUser in these fields:
    - User ID
    - First name
    - Last name
    - Password
    - Confirm password

Manage Users

Create a User

\* User ID  
myUser

\* First name  
myUser

\* Last name  
myUser

E-mail

\* Password  
\*\*\*\*\*

\* Confirm password  
\*\*\*\*\*

**Create** **Cancel**

- \_\_\_ c. Click **Group Membership** to add this user to existing groups.

The screenshot shows the 'Create a User' form. At the top, there's a field labeled '\* User ID' containing 'myUser'. To the right of it is a button labeled 'Group Membership' which is highlighted with a red box. Below this, there are fields for '\* First name' and '\* Last name', both containing 'myUser'. The entire form is set against a light blue background with a dark blue header bar.

- \_\_\_ d. On the Group Membership page, click **Search**.  
 \_\_\_ e. From the **Available** list, select **myGroup** and **rtsUser**, and then click **Add** to map your new user to these groups.  
 \_\_\_ f. Click **Close** to return to the "Create a User" page.

The screenshot shows the 'Group Membership' search interface. At the top, there are search criteria: 'Search by' set to 'Group name', 'Search for' containing '\*', and 'Maximum results' set to '100'. Below this is a 'Search' button. The main area has two sections: 'Mapped To' on the left containing 'myGroup' and 'rtsUser', and 'Available' on the right listing various group names like 'reviewedGroup', 'reviewer', etc. Between these sections are two buttons: '< Add' and 'Remove >'. A 'Close' button at the bottom left is also highlighted with a red box. The background is white with some gray shading around the input fields.

- \_\_\_ g. Click **Create** to complete the creation of this user.

- \_\_\_ 5. Click **Create Like**.

The screenshot shows a success message dialog box. It contains an information icon, the text 'The user was created successfully.', and a link 'myUser'. At the bottom are two buttons: 'Create Like' which is highlighted with a red box, and 'Close'.

- \_\_\_ 6. Create another user that is called: myTester  
 \_\_\_ a. Enter myTester for all the user information.

**Create a User**

\* User ID  
myTester Group Membership

\* First name  
myTester \* Last name  
myTester

E-mail

\* Password  
\*\*\*\*\* \* Confirm password  
\*\*\*\*\*

**Create** **Cancel**

- \_\_\_ b. For **Group Membership**, add myTester to these groups:  
 - myGroup  
 - myTestGroup  
 - rtsUser
- \_\_\_ c. After you create the myTester user, click **Close** to return to the Manage Users page.



### Information

After you create your groups, you can always reopen the **Manage Users** menu to review your updated list of users. For example, click **myTester** and click the **Groups** tab to confirm that this user was correctly mapped.

| Select                   | Group name  |
|--------------------------|-------------|
| <input type="checkbox"/> | myGroup     |
| <input type="checkbox"/> | myTestGroup |
| <input type="checkbox"/> | rtsUser     |

Page 1 of 1 Total: 3

- \_\_\_ 7. You can leave the administrative console open.

## Section 5. Redeploying the Decision Center EAR with the customized permissions

Before your new groups can be used to access Decision Center, you must redeploy the Decision Center application with updated list of roles. In this section, you do these tasks:

- "Declaring your groups in the Decision Center deployment descriptor"
- "Redeploying the EAR file"
- "Changing the class loading sequence"

### 5.1. Declaring your groups in the Decision Center deployment descriptor

To use the Decision Center permissions mechanism, you must upload groups to the database.

You add custom groups by editing the deployment descriptor files in the Decision Center EAR file, which is stored in the following directory on the VMware image:

C:\Program Files\IBM\ODM871\ODM\teamserver\applicationservers



#### Note

The EAR file is a compressed archive. You must open it to extract the files that must be changed, and then replace the files in the EAR file. You should back up the EAR file before you modify it.

### Adding your custom groups to the Decision Center deployment descriptor

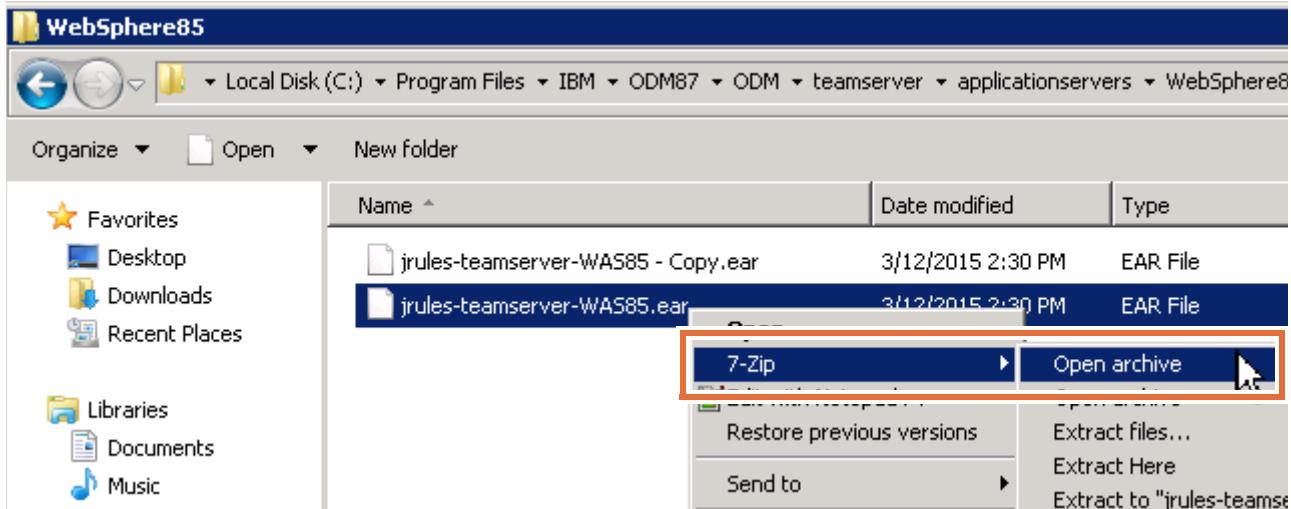
- 1. In Windows Explorer, open the following directory:

C:\Program Files\IBM\ODM871\ODM\teamserver\applicationservers\WebSphere85

- 2. Create a backup of the jrules-teamserver-WAS85.ear file by copying the file and renaming it.

For example, when you copy and paste the file back to the directory, it is automatically renamed: jrules-teamserver-WAS85 – Copy.ear

- \_\_\_ 3. Right-click the `jrules-teamserver-WAS85.ear` file and click **7-Zip > Open archive**.



- \_\_\_ 4. Open the `teamserver.war` file inside 7-Zip and open the `web.xml` deployment descriptor in WordPad.

- \_\_\_ a. Right-click the `teamserver.war` file and click **Open inside**.

The WAR file extracts so that you can see the list of files and folders.

- \_\_\_ b. Double-click the `WEB-INF` folder to open it, and drag the `web.xml` file to your desktop to edit it outside of the WAR file.
- \_\_\_ c. Right-click the `web.xml` file and click **Open With > WordPad**.



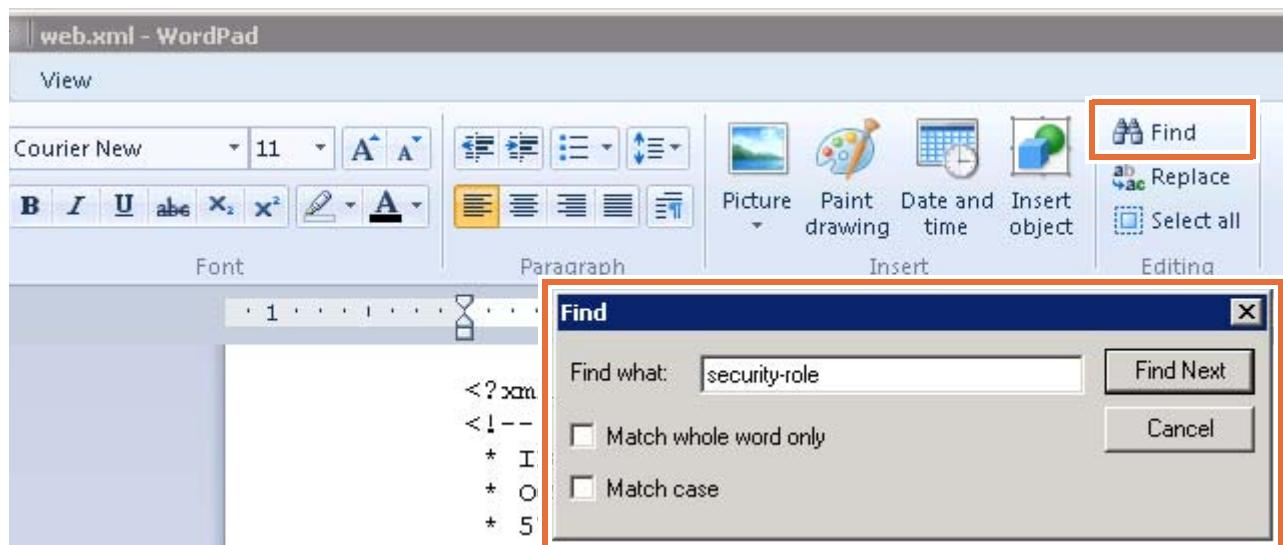
By opening the XML file with WordPad, you can see the formatted text and match your edits to that format.

- \_\_\_ 5. Add your custom groups to the `web.xml` file.

- \_\_\_ a. Go to the **SECURITY - ROLE** section.

You can use one of the following methods:

- You can scroll to this section, which is towards the end of the file.
- You can also click **Find** in the toolbar, enter `security-role` in the **Find what** field, and click **Find Next**.



- \_\_ b. Add your custom groups at the end of the list of roles *after* the line:

```
<!-- Add your custom security roles here if needed -->
```

```
=====
-->
 <!-- S E C U R I T Y - R O L E
-->
 <!--
=====
-->
<security-role>
 <role-name>rtsInstaller</role-name>
</security-role>
<security-role>
 <role-name>rtsAdministrator</role-name>
</security-role>
<security-role>
 <role-name>rtsUser</role-name>
</security-role>
<security-role>
 <role-name>rtsConfigManager</role-name>
</security-role>
<!-- Add your custom security roles here if needed -->
<!--
=====
```

- \_\_ c. Insert this code to add myGroup and myTestGroup.

You can use the following code snippet in <TrainingDir>/code/roles.txt to copy and paste the code into the XML file.

```
<security-role>
 <role-name>myGroup</role-name>
</security-role>
```

```
<security-role>
 <role-name>myTestGroup</role-name>
</security-role>
```

- d. Save the file and close it.
- e. Drag the `web.xml` file from the desktop back into the `WEB-INF` directory, and click **Yes** to confirm that you want to copy the file.

This operation overwrites the `web.xml` file in the `WEB-INF` directory with the `web.xml` file that you edited.

**Note**

If you are prompted to update the archive, click **OK**.

**Note**

If you want to add custom groups to the Decision Center Business console, you can repeat Step 4 to add each custom group to the `decisioncenter.war/WEB-INF/web.xml` file in the EAR file. However, this step is not required for this exercise.

- 6. In 7-Zip, go back to the `jrules-teamserver-WAS85.ear` file to add your custom groups to the `META-INF/application.xml` file.
  - a. If you closed 7-Zip, right-click the `jrules-teamserver-WAS85.ear` file and click **7-Zip > Open archive**.
  - b. Double-click the `META-INF` directory to open it, and drag the `application.xml` file to your desktop to edit it outside of the EAR file.
  - c. Right-click the `application.xml` file and click **Open With > WordPad**.
  - d. Insert your group descriptions at the end of the file, just before the closing `application` block (`</application>`):

```
<security-role>
 <role-name>myGroup</role-name>
</security-role>
<security-role>
 <role-name>myTestGroup</role-name>
```

```
</security-role>
```

```

<security-role>
 <role-name>rtsUser</role-name>
</security-role>
<security-role>
 <role-name>rtsAdministrator</role-name>
</security-role>
<security-role>
 <role-name>rtsConfigManager</role-name>
</security-role>
<security-role>
 <role-name>rtsInstaller</role-name>
</security-role>
</application>
```

- \_\_\_ e. Save the file and close it.
- \_\_\_ f. Drag the file back into the META-INF directory to overwrite the application.xml file in that folder, and click **Yes** to confirm that you want to copy the file.
- \_\_\_ g. If prompted to update the archive, click **OK**.
- \_\_\_ 7. After you complete your edits, close 7-Zip.
- \_\_\_ 8. Delete the web.xml file and application.xml file from your desktop, if you did not delete them earlier.

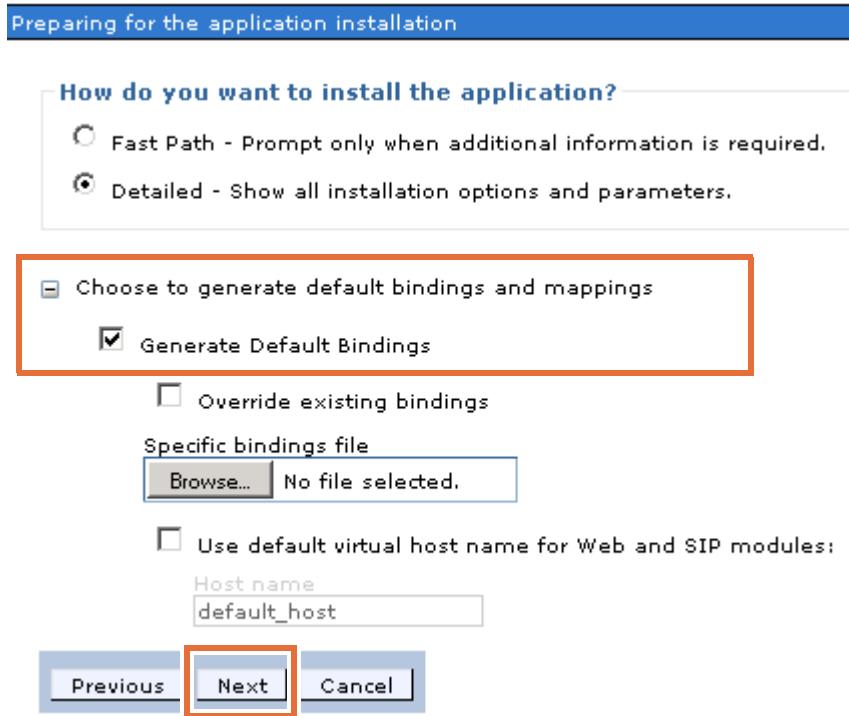
## 5.2. Redeploying the EAR file

- \_\_\_ 1. Return to the WebSphere Application Server administrative console.
- \_\_\_ a. If you are no longer logged in to the WebSphere Application Server administrative console for the sample server, go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Administrative console**.
- \_\_\_ b. Use odm as the login user name and password.
- \_\_\_ 2. Remove the teamserver-WAS85 WebSphere enterprise application.
- \_\_\_ a. In the side pane of the console, click **Applications > Application Types > WebSphere enterprise applications**.
- \_\_\_ b. In the list of applications, select the **teamserver-WAS85** check box and click **Uninstall** on the toolbar.
- \_\_\_ c. Click **OK** to confirm removal of this application, and save the change to the master configuration.
- \_\_\_ 3. Reinstall the teamserver-WAS85 WebSphere enterprise application with the updated jrules-teamserver-WAS85.ear file.
- \_\_\_ a. In the side pane of the console, click **Applications > New Application > New Enterprise Application**.
- \_\_\_ b. Make sure that **Local file system** is selected, and click **Browse** to go to your updated Decision Center EAR file, and click **Open**.

The default installation path is:

C:\Program Files\IBM\ODM871\ODM\teamserver\applicationservers\WebSphere85\jrules-teamserver-WAS85.ear

- \_\_ c. Click **Next**.
- \_\_ d. Select **Detailed - Show all installation options and parameters**.
- \_\_ e. Expand **Choose to generate default bindings and mappings**, select **Generate Default Bindings**, and click **Next**.



- \_\_ f. Click **Continue** to accept the security warning.
- \_\_ g. For **Step 1-8**, click **Next** to accept the default settings.



### Important

Do not skip to step 9. Make sure that you click **Next** at each step.

- \_\_ h. In **Step 9**, map security roles to users and groups.

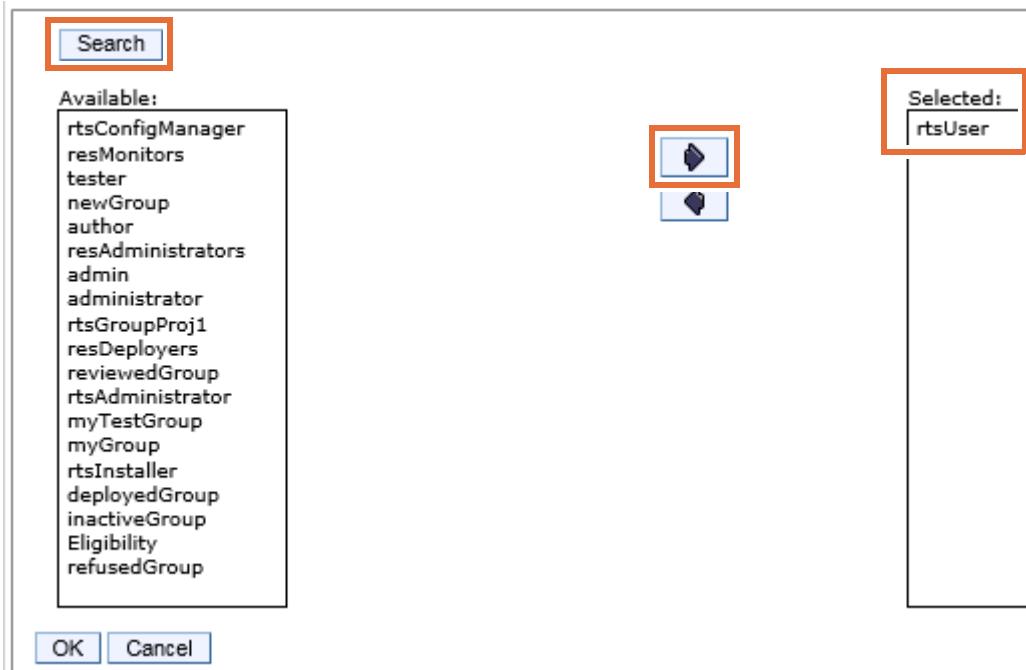
You see a table that lists all the groups that are defined in the deployment descriptor, including your new custom groups. You now map each of these groups to the groups that are defined in the security settings for the application server, as you did in Exercise 2,

"Configuring Rule Execution Server on WebSphere Application Server".

- \_\_\_ a. Select the check box next to `rtsUser` and click **Map Groups...**.

| Select                              | Role             | Special subjects | Mapped users | Mapped groups |
|-------------------------------------|------------------|------------------|--------------|---------------|
| <input checked="" type="checkbox"/> | rtsUser          | None             |              |               |
| <input type="checkbox"/>            | rtsAdministrator | None             |              |               |
| <input type="checkbox"/>            | rtsConfigManager | None             |              |               |
| <input type="checkbox"/>            | rtsInstaller     | None             |              |               |
| <input type="checkbox"/>            | myGroup          | None             |              |               |
| <input type="checkbox"/>            | myTestGroup      | None             |              |               |

- \_\_\_ b. Click **Search** to see the groups, click `rtsUser`, and click the arrow to move it to the **Selected** column.



### Note

You might have to increase the value of **Maximum results** to see all the groups that you require. Or, you can enter `rts*` or `my*` in the **Search string** field to filter the results for the groups that begin with that string.

- \_\_\_ c. Click **OK** and repeat Step a through Step c for all the roles.

**Note**

Each role should be mapped to only one group.

[Step 7 Map virtual hosts for Web modules](#)

[Step 8 Map context roots for Web modules](#)

**→ Step 9: Map security roles to users or groups**

[Step 10 Map JASPI provider](#)

[Step 11 Display module build IDs](#)

[Step 12 Summary](#)

| Select                   | Role             | Special subjects | Mapped users | Mapped groups    |
|--------------------------|------------------|------------------|--------------|------------------|
| <input type="checkbox"/> | rtsUser          | None             |              | rtsUser          |
| <input type="checkbox"/> | rtsAdministrator | None             |              | rtsAdministrator |
| <input type="checkbox"/> | rtsConfigManager | None             |              | rtsConfigManager |
| <input type="checkbox"/> | rtsInstaller     | None             |              | rtsInstaller     |
| <input type="checkbox"/> | myGroup          | None             |              | myGroup          |
| <input type="checkbox"/> | myTestGroup      | None             |              | myTestGroup      |

[Previous](#) [Next](#) [Cancel](#)

- \_\_\_ d. After mapping all the roles, click **Next**.
- \_\_\_ e. Click **Next** for **Step 10** and **Step 11** to accept the default settings.
- \_\_\_ f. On **Step 12**, the Summary page, click **Finish**.

**Important**

Make sure that you click **Finish** only once. It might take a moment for the installation process to start.

- \_\_\_ 4. After the installation completes, click **Save** to save your changes to the master configuration.

Application ILOG Rule Team Server installed successfully.

To start the application, first save changes to the master configuration.

Changes have been made to your local configuration. You can:

- [Save directly to the master configuration.](#)
- [Review changes before saving or discarding.](#)

To work with installed applications, click the "Manage Applications" link.

[Manage Applications](#)

### 5.3. Changing the class loading sequence

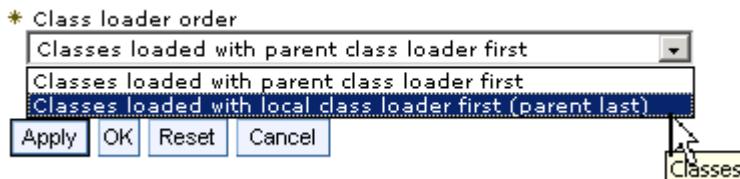
- \_\_\_ 1. Change the class loading sequence for the `teamserver` module.
  - \_\_\_ a. In the side pane of the console, click **Applications > Application Types > WebSphere enterprise applications**.
  - \_\_\_ b. Click the **ILOG Rule Team Server** link.



- \_\_\_ c. In the Modules section, click **Manage Modules**.



- \_\_\_ d. Click the **teamserver** link.
- \_\_\_ e. From the **Class loader order** list, select **Classes loaded with local class loader first (parent last)** and click **OK**.

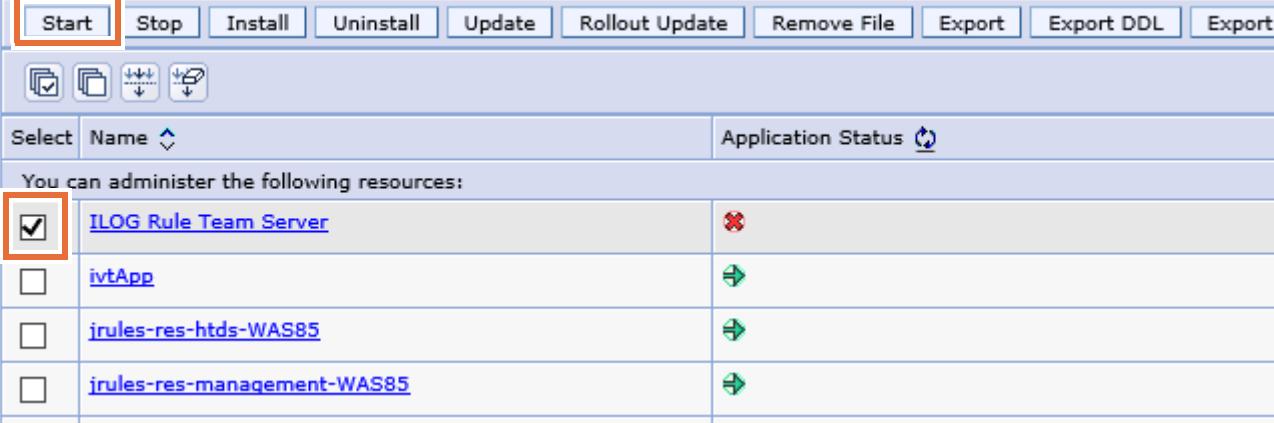


**Note**

If you are updating the Decision Center Business console, you can click **decisioncenter** and repeat this step. For this exercise, you updated only the Enterprise console.

- \_\_\_ f. Click **OK** again to close this section, and click **Save** to save your changes to the master configuration.
- \_\_\_ 2. Start the ILOG Rule Team Server enterprise application.
  - \_\_\_ a. From the side pane, click **Applications > Application Types > WebSphere enterprise applications**.

- \_\_ b. Select **ILOG Rule Team Server** and click **Start** to start the application.



The screenshot shows the IBM ODM Application Manager interface. At the top, there is a toolbar with buttons for Start, Stop, Install, Uninstall, Update, Rollout Update, Remove File, Export, Export DDL, and Export. Below the toolbar is a toolbar with icons for selecting, opening, saving, and deleting files. A search bar with 'Select' and 'Name' dropdowns is followed by an 'Application Status' button. A message says 'You can administer the following resources:' with a table below it. The table has two columns: 'Name' and 'Application Status'. The first row, 'ILOG Rule Team Server', has a checked checkbox and a red 'X' icon in the status column. The other three rows ('ivtApp', 'jrules-res-htds-WAS85', 'jrules-res-management-WAS85') have unchecked checkboxes and green arrow icons in the status column.

| Name                                        | Application Status |
|---------------------------------------------|--------------------|
| <a href="#">ILOG Rule Team Server</a>       | ✖                  |
| <a href="#">ivtApp</a>                      | ➔                  |
| <a href="#">jrules-res-htds-WAS85</a>       | ➔                  |
| <a href="#">jrules-res-management-WAS85</a> | ➔                  |

After the application is started, the **Application status** column shows a green arrow, and you see the following message:

Application ILOG Rule Team Server on server SamplesServer and node SamplesNode started successfully. The collection may need to be refreshed to show the current status.

## 5.4. Signing in to Decision Center with your custom user role

- \_\_ 1. If you need to restart the Decision Center Enterprise console, double-click the Decision Center Enterprise console desktop shortcut or enter the following URL in the web browser:

`http://localhost:9080/teamserver`



### Important

Make sure that you are using the correct port number for the Sample Server. Do not use the port for the other server configurations that you worked on in previous exercises.

- \_\_ 2. Sign in to the Enterprise console with your new user login:

- **User name:** myUser
- **Password:** myUser



### Note

If you already signed into the Decision Center Enterprise console with a different user name, sign out first.

- \_\_ 3. Notice that the available tabs are consistent with the rtsUser privileges. The **Config** tab is not available.

While you can already access Decision Center with this new user role, you complete the setup for this group by adding your custom groups to the Decision Center database.

## Section 6. Adding custom groups to Decision Center

In this section, you add your custom groups to Decision Center.

- 1. Sign out of Decision Center and sign in again as an administrator:
  - **User name:** rtsAdmin
  - **Password:** rtsAdmin
- 2. Make sure that **Work on a rule project** is selected, and select **miniloan-rules** from the **Project in use** list.

- 3. Click the **Configure** tab.



### Note

For this exercise, you test the group permission settings on the `miniloan-rules` project. However, the groups that you set up during the next steps can apply to any project in Decision Center.

- 4. On the **Configure** tab, click **Installation Settings Wizard** in the Administration section.

### Administration

#### [Installation Settings Wizard](#)

Modify an existing installation of Decision Center

#### [Diagnostics](#)

Run diagnostics to check the Decision Center system

#### [Clean Decision Center Cache](#)

Cleans the cache generated by the ruleset generation

#### [Import Projects](#)

Import a .zip file containing one or more projects

#### [Export Current Project State](#)

Export and download the current project for the selected branch or baseline

#### [Erase Current Project](#)

Erase the current project, its branches, and its history. This operation cannot be undone

- \_\_\_ 5. Create a group that is called myGroup.
- \_\_\_ a. Click **Step 3: Setup Groups**, and then click **New**.

**Install**

Install Home > Step 3: Setup Groups

Install Home  
Step 1: Configure Database  
Step 2: Setup Message File  
**Step 3: Setup Groups**  
Step 4: Set Persistence Locale  
Step 5: Set Configuration Parameters

**Setup groups**

To use Decision Center project security as well as its permissions mechanism, all groups (except rtsAdm) declared in both the application server and here.

|                          |                  |
|--------------------------|------------------|
| <input type="checkbox"/> | Groups           |
| <input type="checkbox"/> | Eligibility      |
| <input type="checkbox"/> | Validator        |
| <input type="checkbox"/> | rtsConfigManager |
| <input type="checkbox"/> | rtsUser          |

**New** **Delete**



During Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server", you skipped this step because you did not yet have any custom groups to add.

- \_\_\_ b. On the New Group page, enter `myGroup` in the **Group name** field, and click **Apply**.  
Your new group is now listed.

### Setup groups

To use Decision Center project security as well as its permissions mechanism, all groups (except rtsAdm) declared in both the application server and here.

|                          |                  |
|--------------------------|------------------|
| <input type="checkbox"/> | Groups           |
| <input type="checkbox"/> | Eligibility      |
| <input type="checkbox"/> | Validator        |
| <input type="checkbox"/> | rtsConfigManager |
| <input type="checkbox"/> | rtsUser          |
| <input type="checkbox"/> | <b>myGroup</b>   |

**New** **Delete**

- \_\_\_ c. Click **Apply** so that your changes take effect.

After your changes are applied, you see a message:

Step execution successful

### Setup groups

To use Decision Center project security as well as its permissions mechanism, all groups (except rtsAdministrator) must be declared in both the application server and here.

The screenshot shows a list of groups in a 'Groups' setup interface. The groups listed are: Eligibility, Validator, rtsConfigManager, rtsUser, and myGroup. At the bottom left, there is a success message 'Step execution successful' enclosed in a red box. At the bottom right, there are 'Exit' and 'Apply' buttons.

\_\_ d. Click **Exit**.

The installation log shows your updates.

The screenshot shows an 'Installation log' dialog box. It displays a summary of operations performed: 'Performed operations' and '1 - Groups definition'. It also states that the user will be rerouted to the Decision Center Home page. At the bottom is an 'OK' button.

\_\_ e. Click **OK** to go back to the Enterprise console home page.

\_\_ 6. (Optional.) Repeat Step 4 to Step c to add `myTestGroup`.

After adding the custom groups to Decision Center, you can set fine-grained permissions on the projects in Decision Center to specify what the members of these new groups can do in the Decision Center projects.

## Section 7. Specifying fine-grained permissions

- 1. Go to the **Configure > Edit Permissions** page for **myGroup**.
- a. On the **Configure** tab, click **Edit Permissions**.

**Configure**

**Deployment**

- [Edit Ruleset Extractors](#)  
View and edit the list of extractors used to generate rulesets
- [Manage RuleApps](#)  
Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server
- [Manage Servers](#)  
Create, delete, and edit the servers on which you deploy your projects

**Security**

- [Edit Branch Security](#)  
Edit the security settings of the current project branches
- [Edit Permissions](#)  
Change the rights that users of a given group have to access or modify data
- [View Effective Permissions](#)  
View the effective permissions for a user belonging to several groups

- b. On the Edit Permissions page, select **myGroup** from the list.

**Edit Permissions**

[Save Permissions](#) | [Cancel](#) | [View Effective Permissions](#)

You are currently editing the permissions for the group: **myGroup**

There is no permission defined for this group

**New** **Edit** **Delete**

- 2. Build your permissions table so that the new group:

- Can create and view everything
- Can update actions rules
- Cannot update the status property of an action rule
- Cannot delete anything

- a. Click **New**.
- b. Set these values for the **Create** permission:
- **Permission:** Create
  - **Value:** Yes
  - **Type:** \*
  - **Property:** -

- \_\_\_ c. Click **Apply**.
- \_\_\_ d. Define the **View** permission in the same way that you defined the **Create** permission:
  - **Permission:** View
  - **Value:** Yes
  - **Type:** \*
  - **Property:** -



### Questions

How can you specify permission to update action rules without permission to update the status property of a rule?

### Answer

In this case, you can define the **Update** permission on two separate lines in the permissions table, as shown in the next steps. First, you grant the permission. Then, you specify the limitation.

- \_\_\_ e. Define the **Update** permission for action rules:

- **Permission:** Update
- **Value:** Yes
- **Type:** Action Rule
- **Property:** \*

- \_\_\_ f. Define the limitation by specifying which property cannot be updated:

- **Permission:** Update
- **Value:** No
- **Type:** Action Rule
- **Property:** Status



### Reminder

Remember that permissions are read from top to bottom, so if you reversed the order of these two lines, no limits would be specified on this permission.



### Questions

Do you need to specify any changes to define the **Delete** permission?

**Answer**

Recall that permissions are automatically denied unless they are granted. By default, the group does not have permission to delete any artifact.

3. Click **Save Permissions** on the toolbar to save the changes.

Configure > Edit Permissions

### Edit Permissions

 Save Permissions |  Cancel |  View Effective Permissions |  Help

 Changes have been made to the security settings. Click 'Save Permissions' to save your changes

You are currently editing the permissions for the group: myGroup ▾

| Actions                  | PERMISSION | TYPE        | PROPERTY | VALUE |
|--------------------------|------------|-------------|----------|-------|
| <input type="checkbox"/> | Create     | *           | -        | Yes   |
| <input type="checkbox"/> | View       | *           | -        | Yes   |
| <input type="checkbox"/> | Update     | Action Rule | *        | Yes   |
| <input type="checkbox"/> | Update     | Action Rule | Status   | No    |

4 Results

New | Edit | Delete

## Section 8. Viewing effective permissions

You can view the combined permissions for a user by viewing effective permissions.

You apply group permissions by building the permissions table for that group. The permissions table shows only the permissions that are set for an individual group, but users can belong to more than one group.

If a user belongs to more than one of the groups that can access a project, Decision Center merges the permissions, which you can also view through effective permissions.

- 1. On the **Configure** tab, click **View Effective Permissions**.

**Configure**

**Deployment**

- [Edit Ruleset Extractors](#)  
View and edit the list of extractors used to generate rulesets
- [Manage RuleApps](#)  
Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server
- [Manage Servers](#)  
Create, delete, and edit the servers on which you deploy your projects

**Security**

- [Edit Branch Security](#)  
Edit the security settings of the current project branches
- [Edit Permissions](#)  
Change the rights that users of a given group have to access or modify data
- [View Effective Permissions](#)  
View the effective permissions for a user belonging to several groups

- 2. Select **myGroup** and **rtsUser**, and click **OK**.

**Select Groups**

Please select the groups for which you want to view the effective permissions:

Eligibility  
 Validator  
 myGroup  
 myTestGroup  
 rtsConfigManager  
 rtsUser

**OK**   **Cancel**

- 3. Scroll to **Action Rule** to see the permissions for action rules and their properties.

Notice that all rule properties are marked as Yes except Status, which is marked No.

| ActionRule       | Yes | Yes | Yes | No |
|------------------|-----|-----|-----|----|
| Name             | -   | -   | Yes | -  |
| Group            | -   | -   | Yes | -  |
| Project          | -   | -   | Yes | -  |
| Documentation    | -   | -   | Yes | -  |
| Folder           | -   | -   | Yes | -  |
| Tags             | -   | -   | Yes | -  |
| Active           | -   | -   | Yes | -  |
| Content          | -   | -   | Yes | -  |
| Overridden Rules | -   | -   | Yes | -  |
| Priority         | -   | -   | Yes | -  |
| Effective Date   | -   | -   | Yes | -  |
| Expiration Date  | -   | -   | Yes | -  |
| Status           | -   | -   | No  | -  |
| Categories       | -   | -   | Yes | -  |



### Questions

What are the effective permissions for the rtsUser group only?

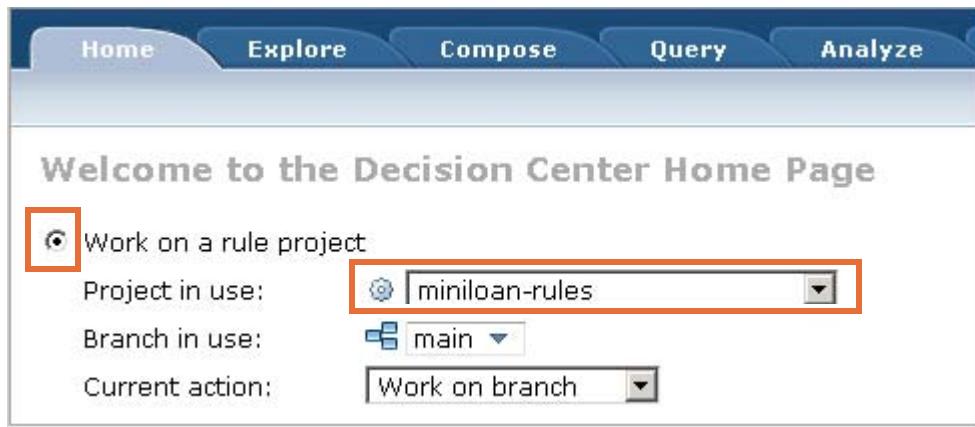
### Answer

By default, all permissions are denied except for the ones that you explicitly set. Therefore, the rtsUser group is denied all permissions. You can check the permissions by returning to the Select Groups page and selecting only the rtsUser group.

When you sign in to Decision Center as myUser, the myGroup permissions apply because myUser belongs to both rtsUser and myGroup and the myGroup permissions are least restrictive.

- 4. Sign out of the Decision Center console and sign in again with the new role by using myUser as the user name and password.

- \_\_\_ 5. On the **Home** tab, select **Work on a rule project** and select **miniloan-rules** from the **Project in use** list.

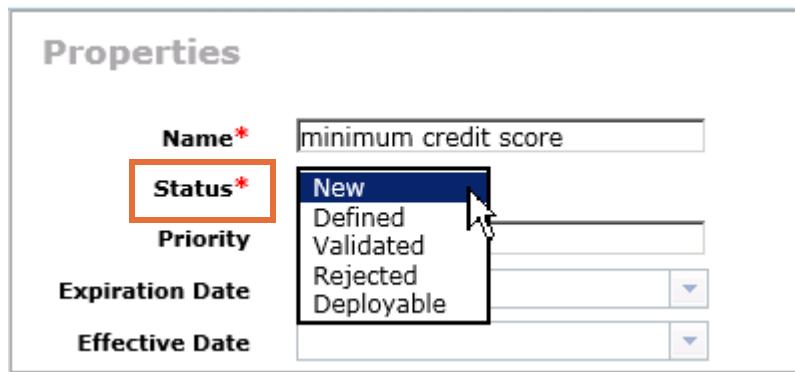


- \_\_\_ 6. Click the **Explore** tab.  
 \_\_\_ 7. In the **Smart Folders** pane, click the **eligibility** folder to open its contents.  
 \_\_\_ 8. Test the permissions for changing the rule status of the minimum credit score rule.  
   \_\_\_ a. Select **minimum credit score** in the table and click **Edit**.

The screenshot shows the 'Explore' tab selected in the navigation bar. The left sidebar contains a 'Smart Folders' tree view with categories like Business Rules, Ruleflows, Templates, Simulations, and Test Suites. The 'eligibility' folder under Business Rules is selected and highlighted with a blue box. The main content area shows a table titled 'Business Rules > eligibility'. The table has columns for Actions, Name, and Status. There are four rows: 1) 'minimum credit score' (Status: New), 2) 'minimum income' (Status: New), and 3) 'repayment and score' (Status: New). The first row ('minimum credit score') has a checked checkbox in the Actions column and is highlighted with a red box. The 'Edit' button in the toolbar above the table is also highlighted with a red box. The toolbar includes buttons for New, Details, Edit, Delete, Copy, Lock, and Refresh.

The Compose wizard opens to the Properties page.

- \_\_ b. Click the **Status** field to open the status list and note that you can change the status to any of these values.



- \_\_ c. Click **Cancel**.



### Questions

You just finished setting fine-grained permissions that do not allow the `myUser` role to change the Status value. But as you just saw, these permissions did not take effect. Why?

### Answer

Before these permissions can take effect, you must enforce security on the project branch.

## Section 9. Enforcing security on a project

- 1. Sign out of Decision Center and sign in again as an administrator (`rtsAdmin`).
- 2. Make sure that **Work on a rule project** is selected, and that **miniloan-rules** is selected as the current project.
- 3. On the **Configure** tab, click **Edit Branch Security**.

### Configure

#### Deployment

[Edit Ruleset Extractors](#)

View and edit the list of extractors used to generate rulesets

[Manage RuleApps](#)

Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server

[Manage Servers](#)

Create, delete, and edit the servers on which you deploy your projects

#### Security

[Edit Branch Security](#)

Edit the security settings of the current project branches

[Edit Permissions](#)

Change the rights that users of a given group have to access or modify data

[View Effective Permissions](#)

View the effective permissions for a user belonging to several groups

- 4. Select **Enforce and configure security for this branch**.
- 5. In the **Available groups** list, select **myGroup** and click the arrow to move it to the **Selected groups** list.

### Branch Security

[Save](#) | [Cancel](#) | [Help](#)

You are currently editing the security settings for project: miniloan-rules, branch: main

- Do not enforce security for this branch  
 Enforce and configure security for this branch

Select the groups that can access the branch:

Available groups:

Eligibility  
Validator  
myTestGroup  
rtsConfigManager  
rtsUser

Selected groups:

myGroup



- 6. Click **Save**.

- \_\_\_ 7. Sign out of Decision Center and sign in again as myUser.
- \_\_\_ 8. On the **Home** tab, make sure **Work on a rule project** and **miniloan-rules** project are selected.
- \_\_\_ 9. On the **Explore** tab, click the **eligibility** folder, select the **minimum credit score** rule, and click **Edit**.
- \_\_\_ 10. In the **Status** field, try to change the status.

**Properties**

|          |                      |
|----------|----------------------|
| Name*    | minimum credit score |
| Status*  | New                  |
| Priority |                      |

The status value is disabled and you cannot edit the field, so your permissions are set correctly.

- \_\_\_ 11. Click **Cancel**.
- \_\_\_ 12. Sign out of the Enterprise console.

## Section 10. Managing access to servers

You can manage which Rule Execution Servers are available to Decision Center and who has permission to access them.

- \_\_\_ 1. If needed, sign out of Decision Center.
- \_\_\_ 2. Sign in to Decision Center as an administrator (rtsAdmin).
- \_\_\_ 3. Go to the **Home** tab and make sure that **Work on a rule project** is selected.
- \_\_\_ 4. On the **Configure** tab, click **Manage Servers**.

The screenshot shows the 'Configure' tab selected in the top navigation bar. Under the 'Deployment' section, the 'Manage Servers' link is highlighted with a red box. Other options like 'Edit Ruleset Extractors' and 'Manage RuleApps' are also visible.

**Configure**

**Deployment**

- [Edit Ruleset Extractors](#)  
View and edit the list of extractors used to generate rulesets
- [Manage RuleApps](#)  
Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server
- [Manage Servers](#)  
Create, delete, and edit the servers on which you deploy your projects

**Security**

- [Edit Branch Security](#)  
Edit the security settings of the current project branches
- [Edit Permissions](#)  
Change the rights that users of a given group have to access or modify data
- [View Effective Permissions](#)  
View the effective permissions for a user belonging to several groups

Each server in the list is available for all Decision Center projects.

- \_\_\_ 5. Select **Sample** in the table and click **Edit**.

The screenshot shows the 'Manage Servers' table. The 'Edit' button for the 'Sample' row is highlighted with a red box. The table lists three servers: 'Events', 'Sample', and 'Simulation'. The 'Sample' row is selected, indicated by a blue highlight.

| <input type="checkbox"/>            | Name       | URL                                  | Username | Password | Description |
|-------------------------------------|------------|--------------------------------------|----------|----------|-------------|
| <input type="checkbox"/>            | Events     | http://localhost:9080/wbe            | odm      | *****    |             |
| <input checked="" type="checkbox"/> | Sample     | http://localhost:9080/res            | resAdmin | *****    |             |
| <input type="checkbox"/>            | Simulation | http://localhost:9080/DecisionRunner | resAdmin | *****    |             |

3 Results

The Edit Server page is where you can add or update server information.

**Edit Server**

|                                                                         |                                                                                                                                                                                                                                                                              |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name*</b>                                                            | Sample                                                                                                                                                                                                                                                                       |
| <b>URL*</b>                                                             | http://localhost:9080/res                                                                                                                                                                                                                                                    |
| <b>Username</b>                                                         | resAdmin                                                                                                                                                                                                                                                                     |
| <b>Password</b>                                                         | *****                                                                                                                                                                                                                                                                        |
| <b>Description</b>                                                      |                                                                                                                                                                                                                                                                              |
| <b>Usage</b>                                                            | <input type="radio"/> Event Runtime<br><input checked="" type="radio"/> Rule Execution Server<br><input type="radio"/> Run Test Suites and Simulations<br><input type="radio"/> Deploy RuleApps<br><input checked="" type="radio"/> Both                                     |
| <b>Authorized groups</b>                                                | <input checked="" type="checkbox"/> All groups<br><div style="border: 1px solid #ccc; padding: 5px; display: inline-block;">           Eligibility<br/>           Validator<br/>           myGroup<br/>           myTestGroup<br/>           rtsConfigManager         </div> |
| <input type="button" value="OK"/> <input type="button" value="Cancel"/> |                                                                                                                                                                                                                                                                              |

- **Name:** Name that is displayed when selecting the server from the list of servers.
- **URL:** Web address of the Rule Execution Server.
- **Username and Password:** Access credentials to the Rule Execution Server. You must enter these details for servers that are used for running test suites and simulations. You can leave these credentials blank for servers used to deploy RuleApps. In this case, you are asked to enter your credentials when you deploy the RuleApp.
- **Description:** Text to help you identify the server in the table of servers. You can also specify how each server is used and who has access to it.
- **Usage:** Select Rule Execution Server, and then specify whether the server is used to deploy RuleApps, run test suites and simulations, or both. The default is both.

- **Authorized groups:** Control who can deploy RuleApps or run test suites and simulations by specifying which Decision Center groups can access a server. By default, all groups can access a server. To reduce this access, clear **All groups** and select the required groups in the list. Press and hold Ctrl to select more than one group.
- 6. Notice that your custom groups are included in the list of groups that has access to the sample server.



**Reminder**

As administrator, you must ensure that any custom roles that are involved in testing or deployment are granted access to the correct servers.

- 7. Click **Cancel** and sign out of the Enterprise console.  
— 8. Close any open browsers.

**End of exercise**

## Exercise review and wrap-up

The first part of the exercise looked at how to set up groups and users on the application server. Next, you saw how to define groups in Decision Center. Finally, you saw how to set fine-grained permissions on rule artifacts in a rule project in Decision Center.



# Exercise 6. Synchronizing across business and development environments

## What this exercise is about

In this exercise, you synchronize rule projects between Rule Designer and Decision Center.

## What you should be able to do

After completing this exercise, you should be able to:

- Synchronize rule projects between Rule Designer and Decision Center
- Create a rule project in Rule Designer from a project in Decision Center
- Export a project from Decision Center for import to Rule Designer or other instances of Decision Center
- Erase a project from Decision Center

## Introduction

In this exercise, you learn how to synchronize across development and business environments. First, you synchronize Rule Designer and Decision Center. Then, you create a rule project in Rule Designer based on an existing rule project in Decision Center. You also use the Decision Center export and import features to exchange projects.

This exercise uses the following files, which are installed in the `<InstallDir>\ODM\studio\training` directory:

- Start project: Ex06: Synchronizing across business and development environments\01-start

The exercise includes these tasks:

- Section 1, "Synchronizing Rule Designer and Decision Center"
- Section 2, "Creating a rule project from Decision Center"
- Section 3, "Exporting and importing projects between Decision Center instances"
- Section 4, "Erasing the project from Decision Center"

## Requirements

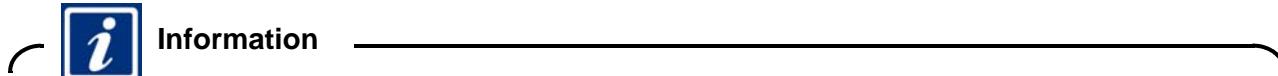
This exercise requires that you use Rule Designer and the Decision Center Enterprise console.

## Section 1. Synchronizing Rule Designer and Decision Center

In this part of the exercise, you publish rules from Rule Designer to Decision Center and modify the rules in Decision Center. Then, you update Rule Designer from Decision Center to capture the changes.

### 1.1. Setting up your environment for this exercise

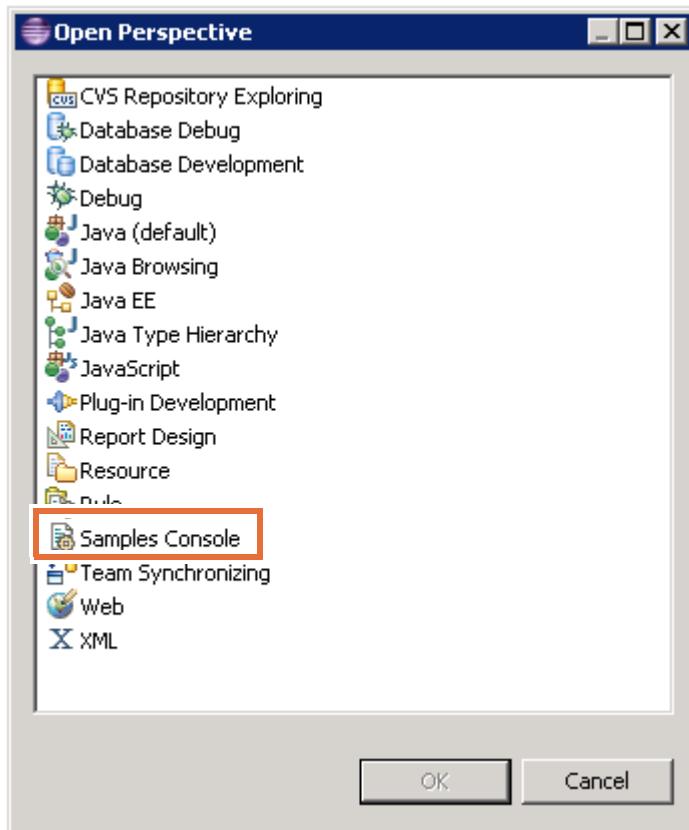
- 1. If the sample server of Operational Decision Manager is not started, start it now by double-clicking the **Start server** desktop shortcut icon. You can also go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server**.  
Starting the sample server might take several minutes.
- 2. Open Rule Designer by double-clicking the **Rule Designer 8.7.1** desktop shortcut icon, or by going to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Rule Designer 8.7.1**.
- 3. When prompted for a workspace path in Rule Designer, type:  
`<TrainingDir>\workspaces\sync`  
If you are using the VMware image that is created for this course, `<TrainingDir>` is `C:\labfiles`.
- 4. Close the **Welcome** view.



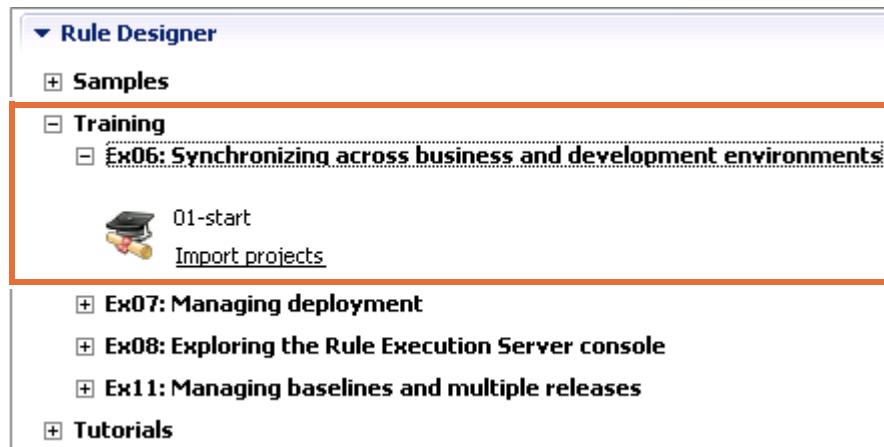
- 5. Switch to the Samples Console and import the start project for this exercise.
  - a. In the upper-right corner, click the **Open Perspective** icon to switch from the Java perspective.



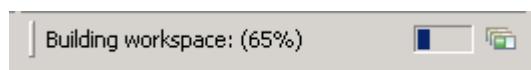
- \_\_\_ b. In the Open Perspective list, select **Samples Console**, and click **OK**.



- \_\_\_ c. In the Rule Designer section, expand **Training > Ex06: Synchronizing across business and development environments**, and under **01-start**, click **Import projects**.



Eclipse automatically switches to the Rule perspective. The workspace takes a few moments to build. You see in the status bar in the lower-right of the window.



The Rule Explorer contains these projects:

- **loan-rules**: The rule project that contains business rules and other rule authoring artifacts. It is the main focus for rule creation and authoring.

- **loan-xom**: The Java project that contains the Execution Object Model (XOM).
- \_\_\_ d. If the **Help** pane is open, you can close it by clicking the **X**.

**Hint**

To give yourself more working area, you can always close the Help or Welcome panes that open by default in Eclipse.

## 1.2. Publishing the rule project to Decision Center

In this section, you publish the `loan-rules` project to Decision Center to create the corresponding project in Decision Center.

- \_\_\_ 1. In the Rule Explorer, right-click the `loan-rules` project and click **Decision Center > Connect**.  
The Decision Center configuration wizard opens.
- \_\_\_ 2. Perform the following actions in the Connection section of the Decision Center configuration wizard:
  - \_\_\_ a. In the **URL** field, enter: `http://localhost:9080/teamserver`

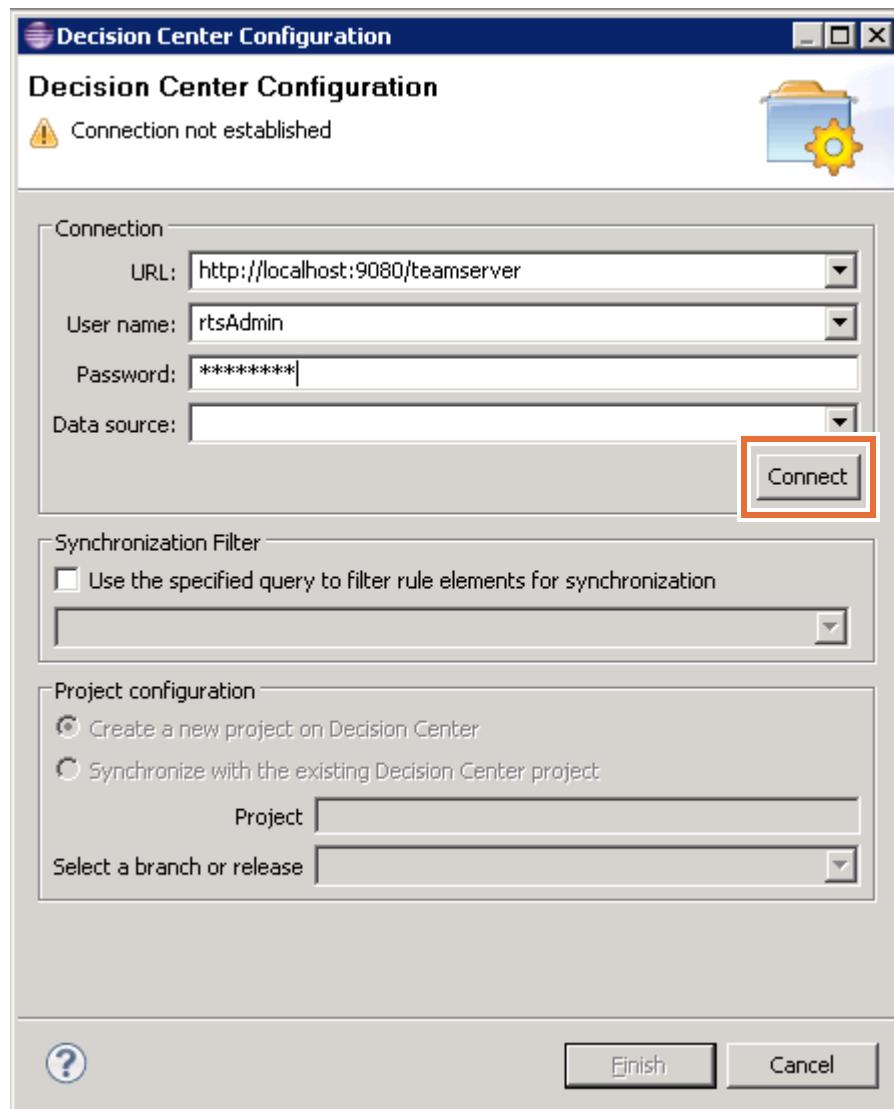
**Important**

Use `9080` as the port if you are using the VMware image that is created for this course.

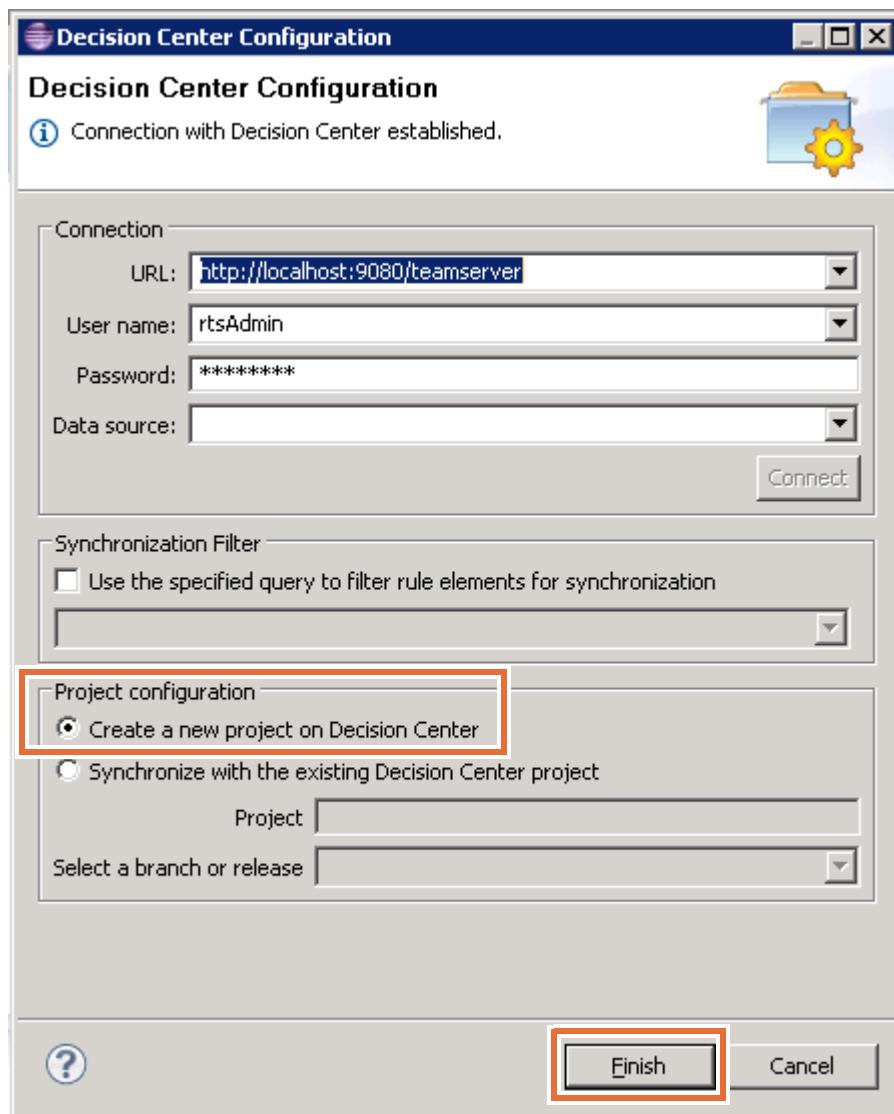
Otherwise, see "Ports" on page -xviii to determine which value to use in your environment.

- \_\_\_ b. In the **User name** and **Password** fields, enter: `rtsAdmin`
- \_\_\_ c. Leave the **Data source** field empty, which is the default value.

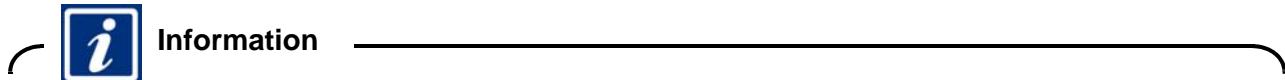
\_\_ d. Click **Connect**.



After the connection is successfully established, the “Project configuration” section is enabled. The **Create a new project on Decision Center** option should be selected because the loan-rules project does not exist yet on Decision Center.



3. Click **Finish**.



If you see a Secure Storage password message, click **No**.



After synchronization completes, you are notified that no changes were found.



- \_\_\_ 4. Click **OK** to close this window.
- \_\_\_ 5. When prompted to switch to the Team Synchronizing perspective, click **No**.

When you do not switch to the Team Synchronizing perspective, the Synchronize pane opens in the lower-right corner. Because you just created this project in Decision Center, no differences exist between the project in Rule Designer and the project in Decision Center.



#### Important

After you publish the `loan-rules` project to Decision Center, do not disconnect from Decision Center so that you do not have to establish this connection again in later steps.

### 1.3. Examining rules in Decision Center

- \_\_\_ 1. Sign in to the Enterprise console to view the rule artifacts that you published from Rule Designer.
  - \_\_\_ a. If the console is closed, double-click the **Decision Center Enterprise console** desktop shortcut icon or go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Decision Center Enterprise console**.
  - \_\_\_ b. Sign in to the console with `rtsAdmin` as both the **User name** and the **Password**.

The Enterprise console opens to the **Home** tab. You can see the different projects and decision services that are available in Decision Center for business users.

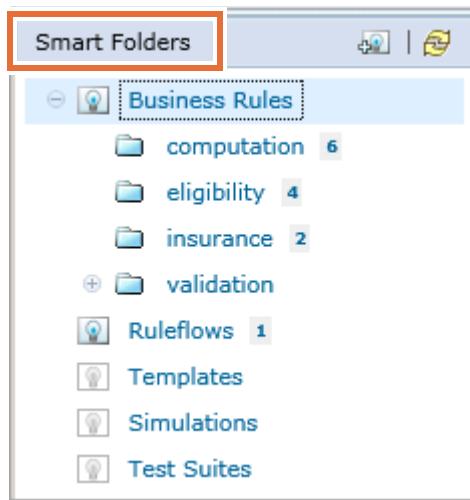
- 2. Select **Work on a rule project** and in the **Project in use** list, select **loan-rules**.

The screenshot shows the IBM Decision Center interface. At the top, there's a navigation bar with tabs: Home, Explore, Compose, Query, Analyze, and Project. Below the navigation bar, the text "Welcome to the Decision Center Home Page" is displayed. Underneath this, there are two radio button options: "Work on a rule project" (selected) and "Work on a decision service". The "Work on a rule project" section includes fields for "Project in use:" (set to "miniloan-rules"), "Branch in use:" (set to "miniloan-rules"), and "Current action:". A dropdown menu is open over the "Project in use:" field, listing several projects: miniloan-rules, bomdomainpopulate-rules, custombml-rules, loan-rules (which is highlighted with a cursor), loanvalidation-rules, miniloan-rules, my-validation-rules, squery-loanvalidation-rules, and valueeditor-rules. Below the dropdown, there's a note about "Loan valuation Service".

- 3. Click the **Explore** tab to open the **loan-rules** project.

The **Explore** tab lists all the artifacts of the **loan-rules** project. Artifacts are organized within smart folders.

By default, business rules are under the **Business Rules** smart folder, and organized in subfolders that correspond to rule packages in Rule Designer.



- 4. Explore the rule artifacts of the **loan-rules** project in the different smart folders, and relate them to the rule artifacts in the rule project in Rule Designer.

## 1.4. Modifying rules in Decision Center

In this section, you make simple changes to get an idea of what business users do in the Decision Center consoles. By creating some differences between the projects in Decision Center and Rule

Designer, you can also see how synchronization works between Decision Center and Rule Designer.

- \_\_\_ 1. On the **Explore** tab, click the **computation** smart folder.
- \_\_\_ 2. Modify the `neverBankruptcy` rule in the `computation` package:
  - \_\_\_ a. Click the **Quick edit** icon beside `neverBankruptcy` in the table.

| Actions | Name                  | Stat |
|---------|-----------------------|------|
|         | bankruptcyScore       | New  |
|         | initialCorporateScore | New  |
|         | neverBankruptcy       | New  |
|         | rate                  | New  |
|         | repayment             | Depl |

The **Rule Editing** view opens.

- \_\_\_ b. In the **then** statement, change the value from 20 to another value, such as: 30 and click **Save**.

**Rule Editing**

**Save | Cancel**

**Name\***: neverBankruptcy

**Status\***: New

**[definitions]**

**if**  
it is not true that the borrower has filed a bankruptcy **X**

**then**  
add **20** ±] to the corporate score in the loan report **X**

**[else]**

When the rule is saved, the view switches from **Rule Editing** to **Rule Preview**.

The screenshot shows a software interface for rule preview. At the top, there's a toolbar with a magnifying glass icon labeled "Rule Preview" and a "Edit" button. Below the toolbar, the rule details are listed: Name: neverBankruptcy and Status: New. The rule logic is displayed in an if-then format:

```

if
 it is not true that 'the borrower' has filed a bankruptcy
then
 add 30 to the corporate score in 'the loan report' ;

```

## 1.5. Synchronizing between Rule Designer and Decision Center

Requirements

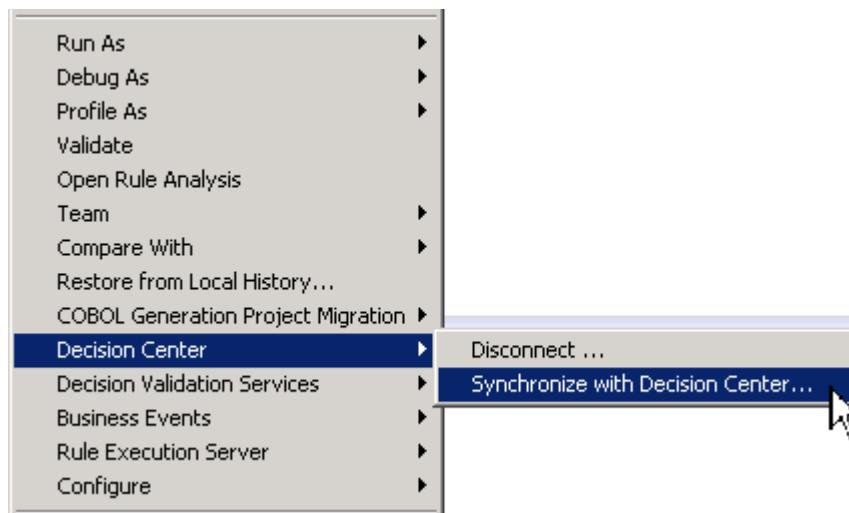
Business analysts indicate that the modified `loan-rules` project in Decision Center must be considered as the primary source of information. As a developer, you must update the modified `loan-rules` project in Rule Designer from Decision Center.

Next, you update Rule Designer based on the changes that you made in Decision Center.

- \_\_\_ 1. Go to Rule Designer and make sure that you are in the Rule perspective.

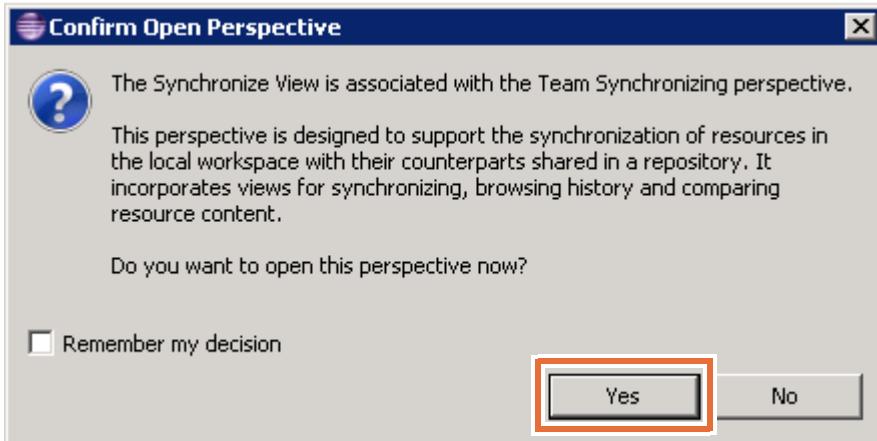


- \_\_\_ 2. Synchronize the `loan-rules` project from Decision Center:
  - \_\_\_ a. In the Rule Explorer, right-click the `loan-rules` project, and click **Decision Center > Synchronize with Decision Center**.



- \_\_\_ b. In the Synchronization Settings window, click **Finish**.

- \_\_\_ c. Click **Yes** when prompted to open the Team Synchronizing perspective.

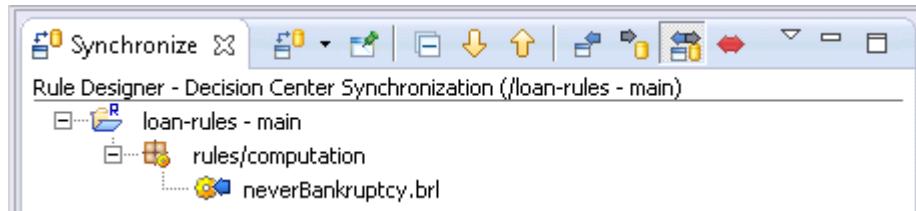


### Warning

Make sure that you wait for workspace build to finish.

When synchronization completes, the Synchronize view lists a series of entries where differences are detected between the local and remote versions of your rule project.

- \_\_\_ 3. In the Synchronize view, expand the `loan-rules` project to see the `neverBankruptcy.brl` rule, as shown here.



In the Synchronize view, entries show whether rule artifacts were modified locally, remotely, or both concurrently. The color and direction of the arrow in the entry icon indicates where the modification occurred, and what type of action is possible.

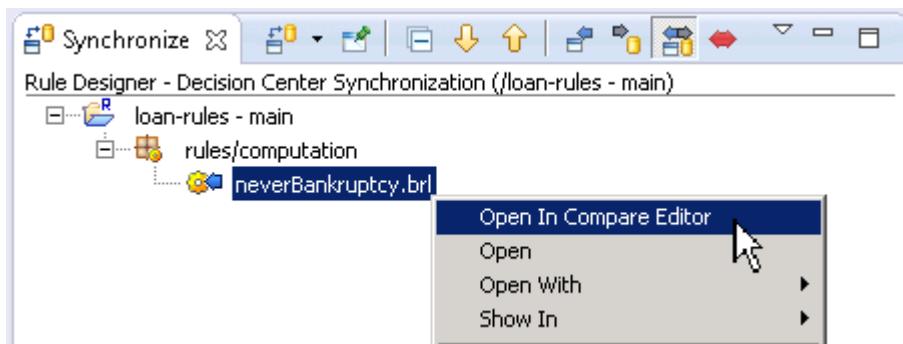
| Entry                                                | Meaning                               | Expected actions                                                                                                                                                                                                                                                        |
|------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Black entries with an arrow that points to the right | A change occurred in Rule Designer.   | Publish to Decision Center what is in Rule Designer: right-click the rule artifact, and click <b>Publish</b> .<br>Select <b>Override and Update</b> if you want to override the changes, keep the version from Decision Center, and update Rule Designer.               |
| Blue entries with an arrow that points to the left   | A change occurred in Decision Center. | Update Rule Designer with what is in Decision Center: right-click the rule artifact, and click <b>Update</b> .<br>Select <b>Override and Publish</b> if you want to override the changes, keep the version from Rule Designer, and publish it again to Decision Center. |

| Entry                          | Meaning                                                        | Expected actions                                                                                                                                                                                                                                                                                                            |
|--------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Red entries with double arrows | Changes occurred in both Rule Designer and in Decision Center. | Automatic merging is not possible. Decide how to handle this conflict.<br>If you want to update Rule Designer with the changes made in Decision Center, select <b>Override and Update</b> .<br>If you want to keep the changes from Rule Designer and publish them to Decision Center, select <b>Override and Publish</b> . |

**Note**

In this case, the change was made in Decision Center, so the entry for the `neverBankruptcy` rule has a blue arrow that points to the left.

- 4. Compare the Decision Center version of the `neverBankruptcy.brl` rule with the Rule Designer version.
  - a. Right-click `neverBankruptcy.brl` in the Synchronize view.
  - b. Click **Open in Compare Editor** to compare the two versions.



The Text Compare view shows you all differences between the Rule Designer and Decision Center versions of rule artifacts.

Also, note the UUIDs are the same for these artifacts, which is how the synchronization mechanism matches these rules to detect differences.

```

<?xml version="1.0" encoding="UTF-8"?>
<model.brl:ActionRule xmi:version="2.0" xmlns="http://www.ilog.com/xml/xsd/model/brl.xsd" name="neverBankruptcy">
<uuid>d7a63272-db02-45a3-a428-8864c016b1ef</uuid>
<status>new</status>
<locale>en_US</locale>
<priority></priority>
<definition><![CDATA[if
 it is not true that 'the borrower' has filed for bankruptcy
then
 add 20 to the corporate score in 'the loan score'
]]></definition>
</model.brl:ActionRule>

```

- \_\_\_ c. Close the Text Compare view.
- \_\_\_ 5. Update the neverBankruptcy.brl rule.
  - \_\_\_ a. In the Synchronize view, right-click **neverBankruptcy.brl**.
  - \_\_\_ b. Click **Update**.

After you update a rule artifact in Rule Designer, the corresponding entry is no longer visible in the Synchronize view.



#### Note

In this exercise, you update Rule Designer from Decision Center. In your enterprise, you might find that some of the changes that were made in Decision Center are not appropriate.

In such cases, you can overwrite these changes and publish the initial artifacts again from Rule Designer to Decision Center by selecting **Override and Publish**, instead of **Update**.

- \_\_\_ 6. Go into the Rule perspective again to look at the loan-rules project in the Rule Explorer.



- \_\_\_ 7. Expand **loan-rules > rules > computation** and open the **neverBankruptcy** rule.  
The rule project in Rule Designer matches the rule project in Decision Center.
- \_\_\_ 8. Synchronize the **loan-rules** project again.
  - \_\_\_ a. Right-click the **loan-rules** project, and clicking **Decision Center > Synchronize with Decision Center**.

- \_\_ b. Click **Finish** in the Synchronization Settings window.

The Synchronize Complete - Decision Center Synchronization window opens to notify you that no changes are found. You also do not need to switch to the Team Synchronizing perspective.

- \_\_ c. Click **OK** to close the Synchronize Complete window.

- \_\_ d. In the Confirm Open Perspective window, click **No**.

- \_\_ 9. Close the neverBankruptcy rule.

## Section 2. Creating a rule project from Decision Center

In this part of the exercise, you create a rule project in Rule Designer from an existing rule project in Decision Center.



### Information

For more information about rule projects, see the product documentation.



### Requirements

Business analysts indicate that they worked with another team and developed a complementary project, called `loanvalidation-rules`. The latest version of this `loanvalidation-rules` project is in Decision Center. Business analysts ask you to import this project in Rule Designer to look at it.

### 2.1. Creating the rule project

You create a rule project in Rule Designer that corresponds to the `loanvalidation-rules` project in Decision Center.

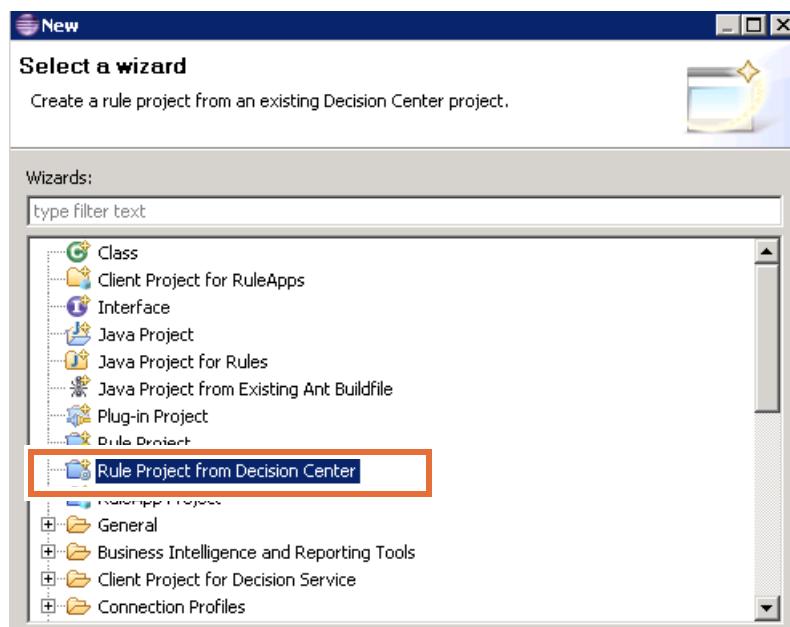


### Note

For this exercise, you do not need to switch to a new workspace. However, it is good practice to always use one workspace for each rule project that is to be synchronized.

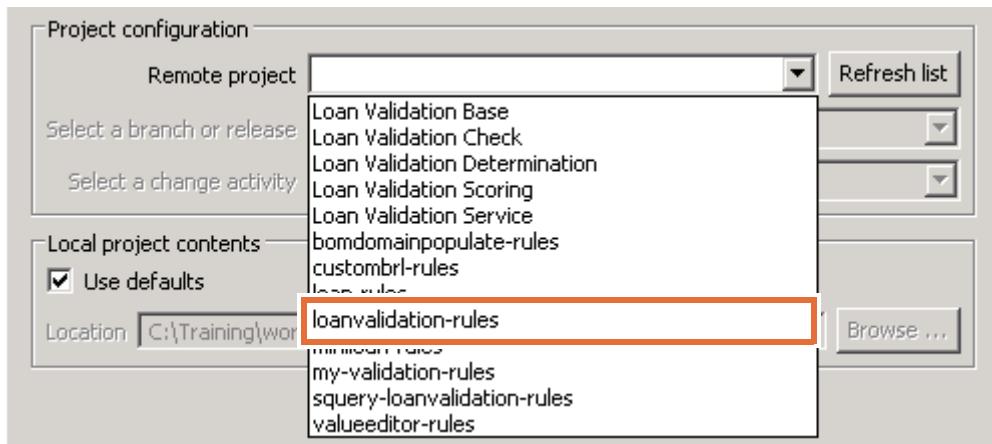
1. In Rule Designer, make sure that you are in the Rule perspective.

- \_\_ 2. Create the loanvalidation-rules project from Decision Center.
- \_\_ a. Click **File > New > Other**, select **Rule Project from Decision Center**, and click **Next**.



The New Rule Project from Decision Center wizard opens.

- \_\_ b. Verify the connection entries, which should still be available from the previous exercise.
- **URL:** `http://localhost:9080/teamserver`
  - **User name:** `rtsAdmin`
  - **Password:** `rtsAdmin`
- \_\_ c. Click **Connect**.
- \_\_ d. In the “Project configuration” section, select the `loanvalidation-rules` project from the **Remote Project** list to import it into Rule Designer.



The **Remote Project** list shows all the rule projects in Decision Center for which you have the **View** permission. This permission depends on the **user name** that you used to connect. Here, because you are connected as `rtsAdmin`, the Decision Center administrator, you can see all the rule projects in Decision Center.

- \_\_ e. In the **Select a branch or release** list, select **main**.

The **Select a branch or release** list displays only `main` because there is only one branch for this project.

- \_\_\_ f. Click **Finish**.

Rule Designer imports all the items in the rule project into your workspace and creates the `loanvalidation-rules` project in Rule Designer based on its content in Decision Center.

- \_\_\_ 3. Click **OK** to close the Synchronize Complete window, which states that no changes are found.
- \_\_\_ 4. When prompted to switch to the Team Synchronizing perspective, click **No** to remain in the Rule perspective.
- \_\_\_ 5. Look at the created rule project in Rule Designer, and relate its content to the content of the corresponding rule project in Decision Center.



### Questions

The imported project has errors. Why?

- \_\_\_ 6. Disconnect Rule Designer from Decision Center for the `loanvalidation-rules` project.
- \_\_\_ a. Right-click the `loanvalidation-rules` project and click **Decision Center > Disconnect**.  
The “Disconnect from Decision Center” window opens.
- \_\_\_ b. Select the **Keep the Decision Center entries files** option, and click **Yes**.



### Information

The Decision Center synchronization error window states that there is no XOM for `loanvalidation`.

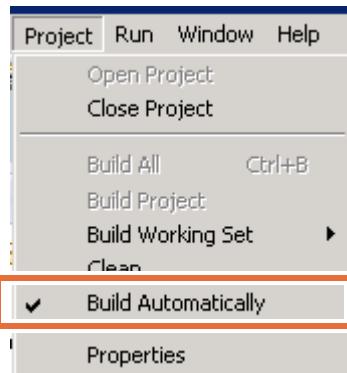
You learn more about this error in the next part of the exercise.

- \_\_\_ c. Click **OK** to close the error window.

## 2.2. Finalizing the rule project in Rule Designer

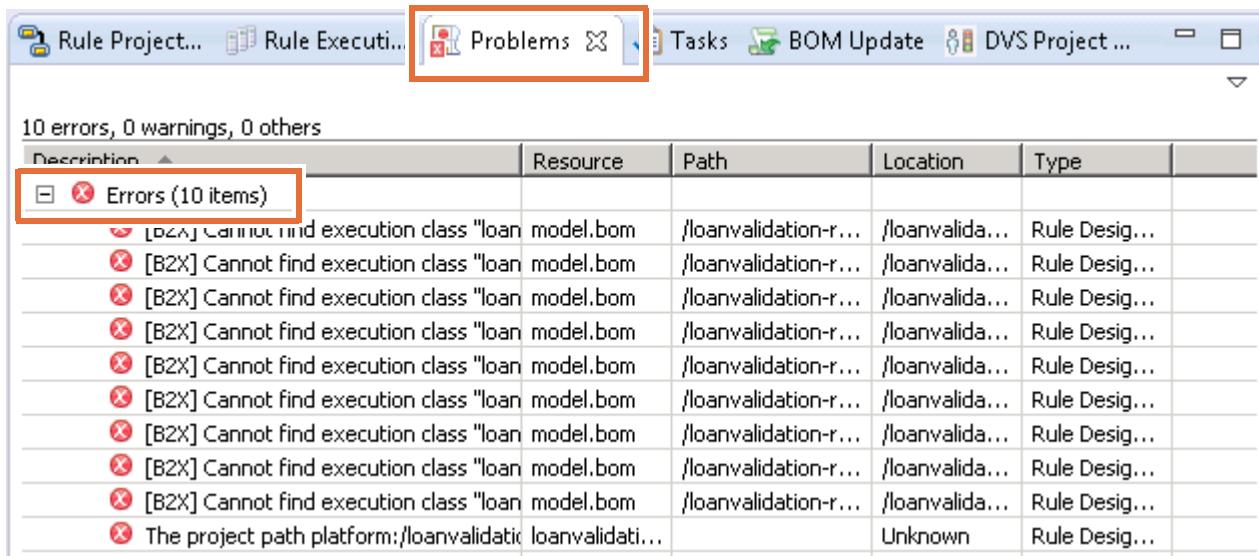
After you successfully retrieve a rule project from Rule Designer, your work is not necessarily finished. In many cases, as you see now with the `loanvalidation-rules` project, you still have a few steps to follow.

- \_\_\_ 1. In the Rule perspective, make sure that the **Project > Build Automatically** menu item is selected.



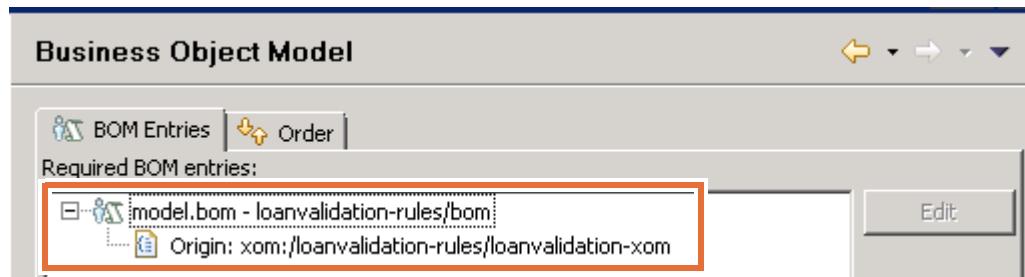
This option should be selected by default.

- \_\_\_ 2. Open the **Problems** view in the lower part of the perspective and expand **Errors**.



- \_\_\_ 3. Open the `loanvalidation-rules` project properties, and look at **Business Object Model** in the Properties window.
  - \_\_\_ a. Right-click **loanvalidation-rules** and click **Properties**.
  - \_\_\_ b. Click **Business Object Model**, and expand **model.bom - loanvalidation-rules.bom**.

You can see that the business object model for loanvalidation-rules originates from the loanvalidation-XOM.



- \_\_\_ c. Click **Cancel** to close the Properties window.



#### Information

To build a rule project in Rule Designer that is created from Decision Center, you must also have its referenced projects. Referenced projects include any executable elements, such as Java XOMs, JAR files, or libraries, that are not in Decision Center.

The loanvalidation-rules project cannot build because it requires the loanvalidation-xom project, which is not present in your Rule Designer workspace.



#### Stop

For this exercise, you are not required to retrieve the missing XOM.

## Section 3. Exporting and importing projects between Decision Center instances

### 3.1. Exporting the project from Decision Center

- 1. If you closed the Decision Center Enterprise console, reopen it and sign in with `rtsAdmin` as the user name and password. If the Enterprise console is already open, click the **Home** tab.
- 2. On the **Home** tab, make sure that **Work on a rule project** is selected, and select the **loan-rules** project as the project in use.
- 3. Export the current state of the `loan-rules` project.
  - a. Click the **Configure** tab.
  - b. On the **Configure** tab, in the Administration section, click **Export Current Project State**.

#### Administration

##### [Installation Settings Wizard](#)

Modify an existing installation of Decision Center

##### [Diagnostics](#)

Run diagnostics to check the Decision Center system

##### [Clean Decision Center Cache](#)

Cleans the cache generated by the ruleset generation

##### [Import Projects](#)

Import a .zip file containing one or more projects

##### [Export Current Project State](#)

Export and download the current project for the selected branch or baseline

##### [Erase Current Project](#)

Erase the current project, its branches, and its history. This operation cannot be undone

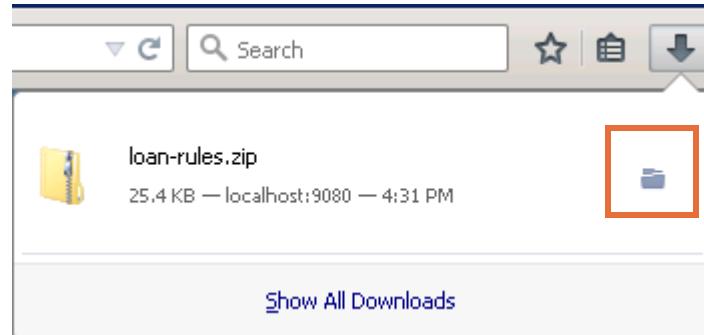
- c. When prompted to confirm the export, click **Yes**.



- \_\_\_ d. When prompted, click the link to the `loan-rules.zip` file and save it.



- \_\_\_ 4. When the download is completed, open the containing folder to view and manage the compressed file.



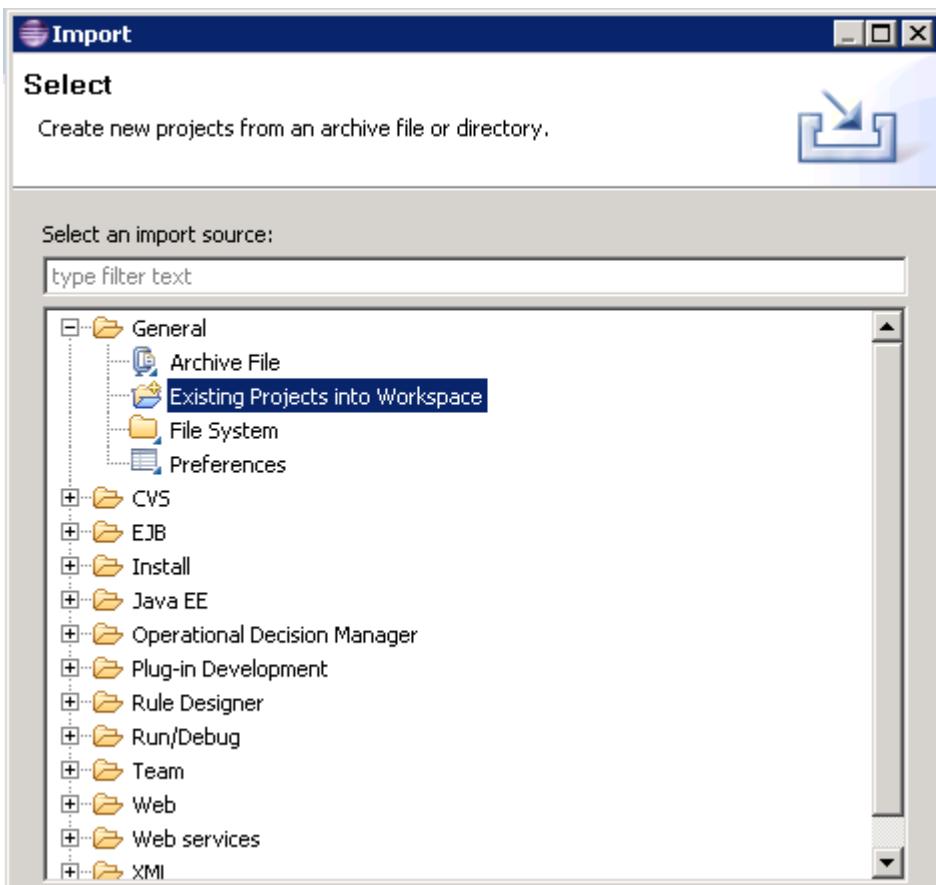
- \_\_\_ 5. Move the compressed file to a convenient temporary folder, such as `C:\labfiles`.

Your rule project is now available for import to Rule Designer or another instance of Decision Center.

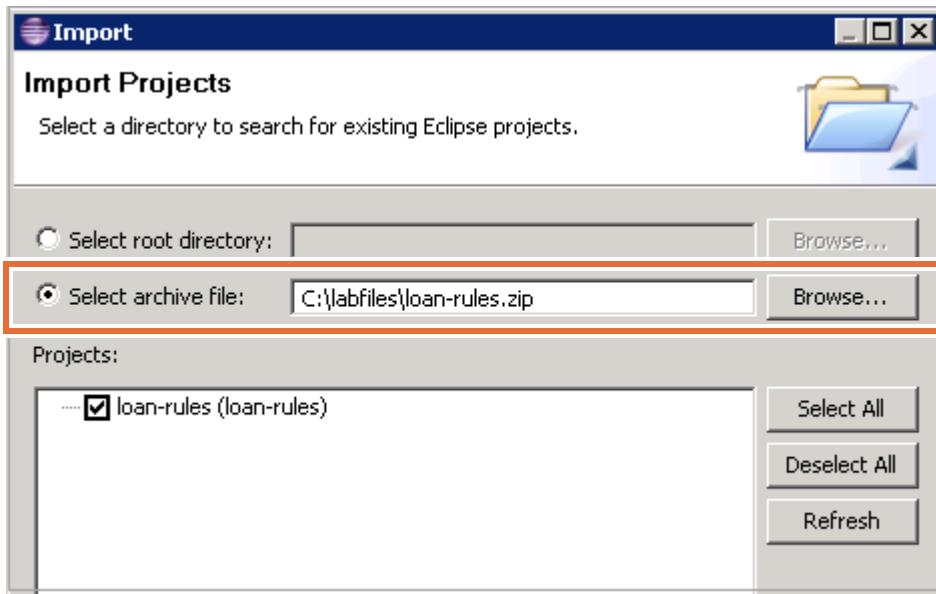
### 3.2. Importing the rule project into Rule Designer

- \_\_\_ 1. In Rule Designer, switch to a new workspace.
  - \_\_\_ a. From the **File** menu, click **Switch Workspace > Other**.
  - \_\_\_ b. When prompted for a workspace name, type:  
`C:\labfiles\workspaces\sync-importDC`
  - \_\_\_ c. Close the **Welcome** tab.
- \_\_\_ 2. Switch to the Rule Perspective.
  - \_\_\_ a. Click the **Open Perspective** icon.
  - \_\_\_ b. Select **Rule**, and click **OK**.

- \_\_\_ 3. Import the loan-rules project by using the .zip file that you created.
- \_\_\_ a. Open the **File > Import** menu, click **General > Existing Projects into Workspace**.



- \_\_\_ b. Click **Next**.
- \_\_\_ c. On the Import Projects page, make sure that you click **Select archive file** and click **Browse** to select your loan-rules.zip file in the folder where you saved it and click **Open**.



- \_\_\_ d. Click **Finish**.

The rule project is now available in your Rule Designer workspace.

However, you have the same errors as you discovered in "Finalizing the rule project in Rule Designer" on page 6-18. You can ignore these errors for now.

- \_\_\_ 4. Close Rule Designer.

### 3.3. Importing the rule project into Decision Center

You can import a project into Decision Center even if the project exists in the Decision Center repository. If there are changes in some of the project artifacts, you can either override the artifacts in Decision Center or ignore the changes during the import.

- \_\_\_ 1. Go back to Decision Center, and click the **Home** tab.
- \_\_\_ 2. If you need to sign in again, use `rtsAdmin` as the user name and password.
- \_\_\_ 3. Select **Work on a rule project** and make sure that **loan-rules** is the project in use.
- \_\_\_ 4. Import the `loan-rules.zip` file that you created into Decision Center.
  - \_\_\_ a. Click the **Configure** tab.
  - \_\_\_ b. On the **Configure** tab, in the Administration section, click **Import Projects**.

#### Administration

##### [Installation Settings Wizard](#)

Modify an existing installation of Decision Center

##### [Diagnostics](#)

Run diagnostics to check the Decision Center system

##### [Clean Decision Center Cache](#)

Cleans the cache generated by the ruleset generation

##### [Import Projects](#)

Import a .zip file containing one or more projects

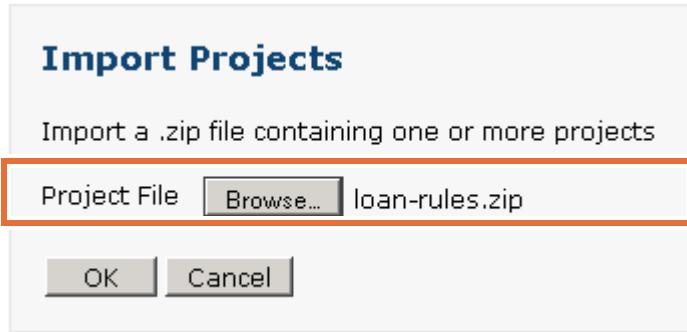
##### [Export Current Project State](#)

Export and download the current project for the selected branch or baseline

##### [Erase Current Project](#)

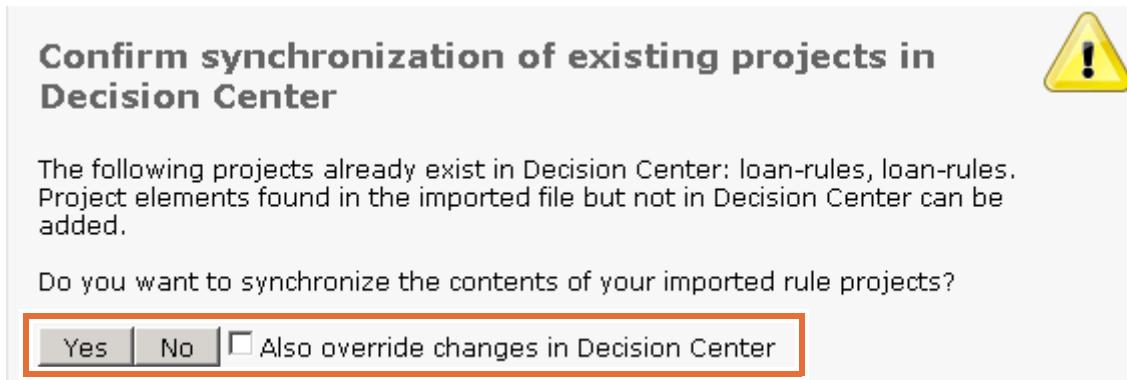
Erase the current project, its branches, and its history. This operation cannot be undone

- \_\_ c. On the Import Projects page, click **Browse** to find your `loan-rules.zip` file and click **OK**.



Because this project exists in the Decision Center repository, you are prompted to synchronize.

- \_\_ d. Click **Yes** to synchronize.



In this case, you are importing the same project that you exported, so there are no changes.

However, you can select **Also override changes in Decision Center** to make sure that updates from the compressed file are kept.

## Section 4. Erasing the project from Decision Center

You can erase a rule project so that all its entries in the database are permanently removed and it no longer is displayed in Decision Center. This feature can be useful before you import projects from a compressed file and want to ensure that there are no conflicts during the import process.

- 1. Click the **Home** tab to make sure that **Work on a rule project** is selected and that **loan-rules** is the project in use.
- 2. Click the **Configure** tab, and in the Administration section, click **Erase Current Project**.

### Administration

#### Installation Settings Wizard

Modify an existing installation of Decision Center

#### Diagnostics

Run diagnostics to check the Decision Center system

#### Clean Decision Center Cache

Cleans the cache generated by the ruleset generation

#### Import Projects

Import a .zip file containing one or more projects

#### Export Current Project State

Export and download the current project for the selected branch or baseline

#### Erase Current Project

Erase the current project, its branches, and its history. This operation cannot be undone

- 3. Click **Yes** when you are asked to confirm the project deletion.
- 4. Sign out of the Enterprise console and close the browser.

## End of exercise

## Exercise review and wrap-up

The first part of this exercise looked at how to synchronize between Rule Designer and Decision Center. You then learned how to use the Decision Center export and import feature to exchange projects.

# Exercise 7. Managing deployment

## What this exercise is about

This exercise describes how to configure RuleApp deployment from Rule Designer and Decision Center to Rule Execution Server.

## What you should be able to do

After completing this exercise, you should be able to:

- Define RuleApp and ruleset properties
- Manage deployment from Rule Designer and Decision Center
- Deploy client applications

## Introduction

This exercise provides the basis for some of the work that you do during Exercise 8, "Exploring the Rule Execution Server console".

In this exercise, you learn how to configure and verify deployment from Rule Execution Server console. First, you learn how to deploy a RuleApp from Rule Designer to Decision Center. Next, you redeploy the rules from Decision Center. You then view the deployed rules in the Rule Execution Server console.

Finally, you deploy a web application that requests execution of the rules that you deploy to Rule Execution Server. In Exercise 9, "Auditing ruleset execution through Decision Warehouse", you learn how to monitor rule execution.

The exercise includes these sections:

- Section 1, "Working with RuleApps for deployment to Rule Execution Server"
- Section 2, "Creating deployment configurations and deploying from Rule Designer"
- Section 3, "Deploying a RuleApp from Decision Center"
- Section 4, "Viewing the deployed RuleApp in Rule Execution Server console"
- Section 5, "Deploying the client application to test ruleset execution"
- Section 6, "Troubleshooting RuleApp deployment from Decision Center"

## Requirements

This exercise requires that you use Rule Designer, Decision Center Enterprise console, and Rule Execution Server console.

## Section 1. Working with RuleApps for deployment to Rule Execution Server

In this section, you work with RuleApps to prepare them for deployment to Rule Execution Server from Rule Designer.

You do these tasks:

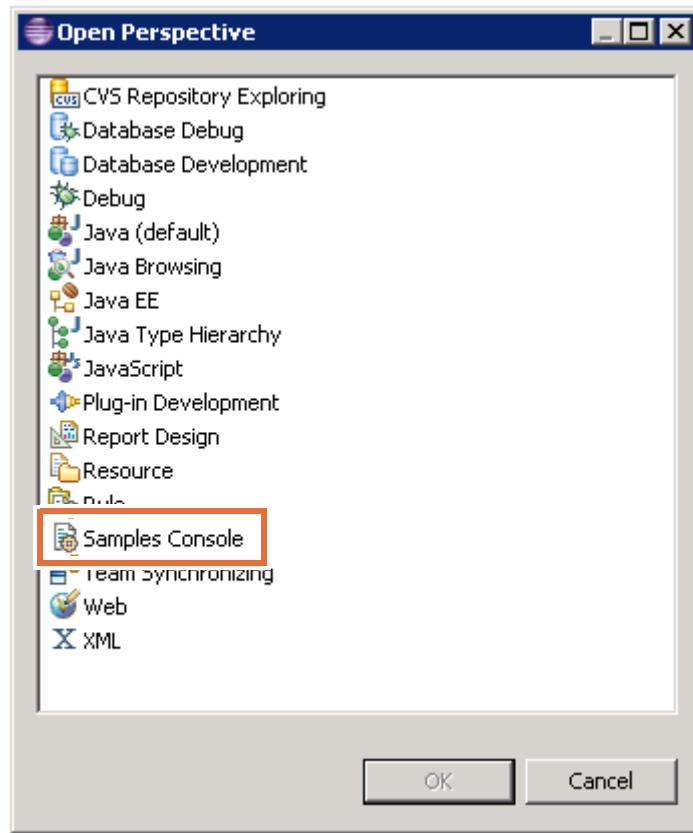
- "Setting up your environment"
- "Exploring the RuleApp"
- "Adding a ruleset property to a ruleset"

### 1.1. Setting up your environment

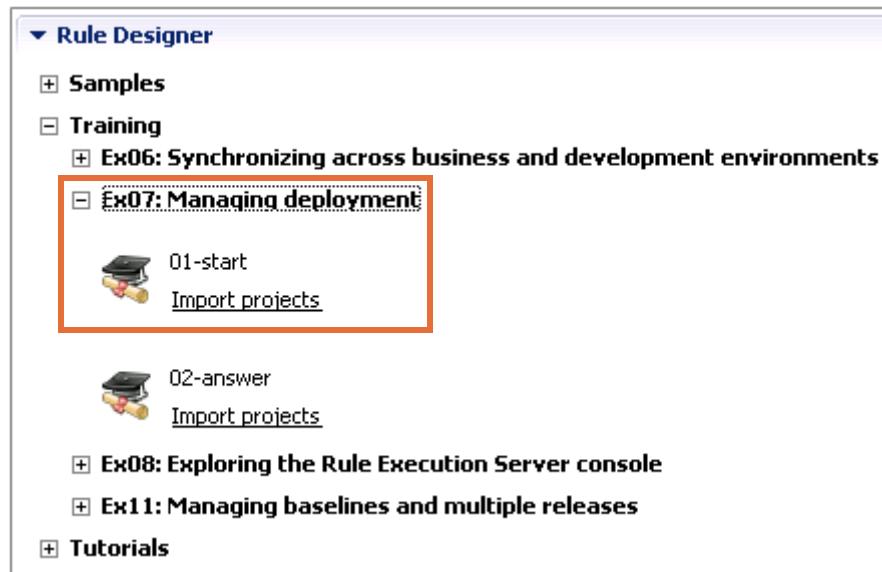
- 1. If the sample server is not started, click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server.**
- 2. Open Rule Designer and switch to a clean workspace.
  - a. From the **File** menu, click **Switch Workspace > Other.**
  - b. When prompted for a workspace name, type:  
`C:\labfiles\workspaces\deploy`
- 3. Switch to the Samples Console.
  - a. Click the **Open Perspective** icon.



- \_\_ b. In the Open Perspective list, select **Samples Console**, and click **OK**.



- \_\_ 4. Import the project **Ex07: Managing deployment > 01-start**.
- \_\_ a. In the Rule Designer section, expand **Training > Ex07: Managing deployment**, and under **01-start**, click **Import projects**.



- \_\_ b. Wait for the workspace to complete its build and close the **Help** tab.

The Rule perspective opens and your workspace has these projects available in the Rule Explorer:

- loan-RuleApp
- loan-rules
- loan-webapp

This project is a client web application that you use at the end of this exercise to test the execution of the rules that you deploy to Rule Execution Server.

- loan-xom

## 1.2. Exploring the RuleApp

Before the rules can be used for execution, they must be grouped as a ruleset and packaged as a RuleApp. The RuleApp is then deployed to Rule Execution Server.

In general, developers determine which rules to package, but you might be required to manage deployment when RuleApps are updated.

1. In Rule Designer, expand the **loan-RuleApp** project and look at the generated files.
2. Expand the **runtime** folder to see the `loanrules10.jar` file.

The `loanrules10.jar` file is the ruleset archive that corresponds to the `loan-rules` rule project.

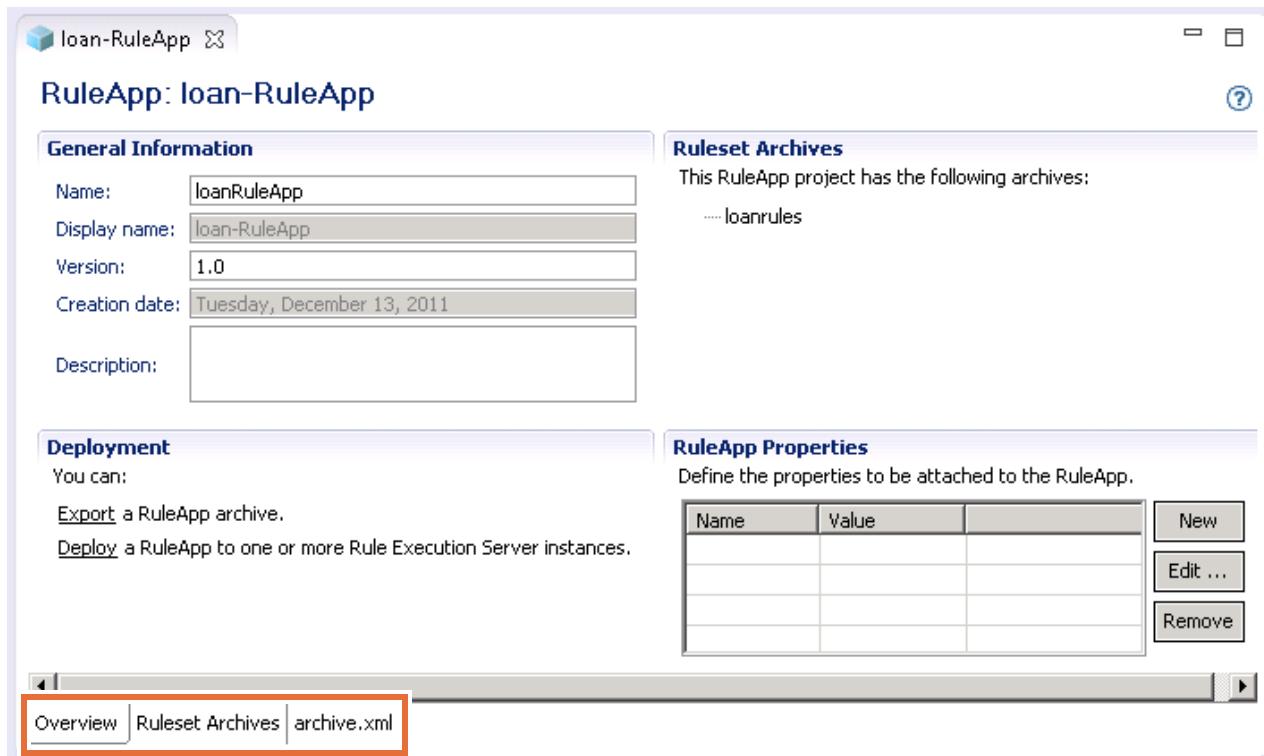


### Hint

You can explore the content of the ruleset archive (JAR file) by changing its extension to `.zip` and viewing it with the Windows Explore function.

If you change the extension of the ruleset archive file, make sure that you rename the extension back to `.jar` before you proceed.

- \_\_\_ 3. Right-click the archive.xml file in the loan-RuleApp project and click **Open With > RuleApp Editor** to open the loan-RuleApp RuleApp.



Notice the three tabs of the RuleApp editor: **Overview**, **Ruleset Archives**, and **archive.xml**. These tabs are used to define deployment and monitoring options.

- \_\_\_ 4. On the **Overview** tab, add a RuleApp property.



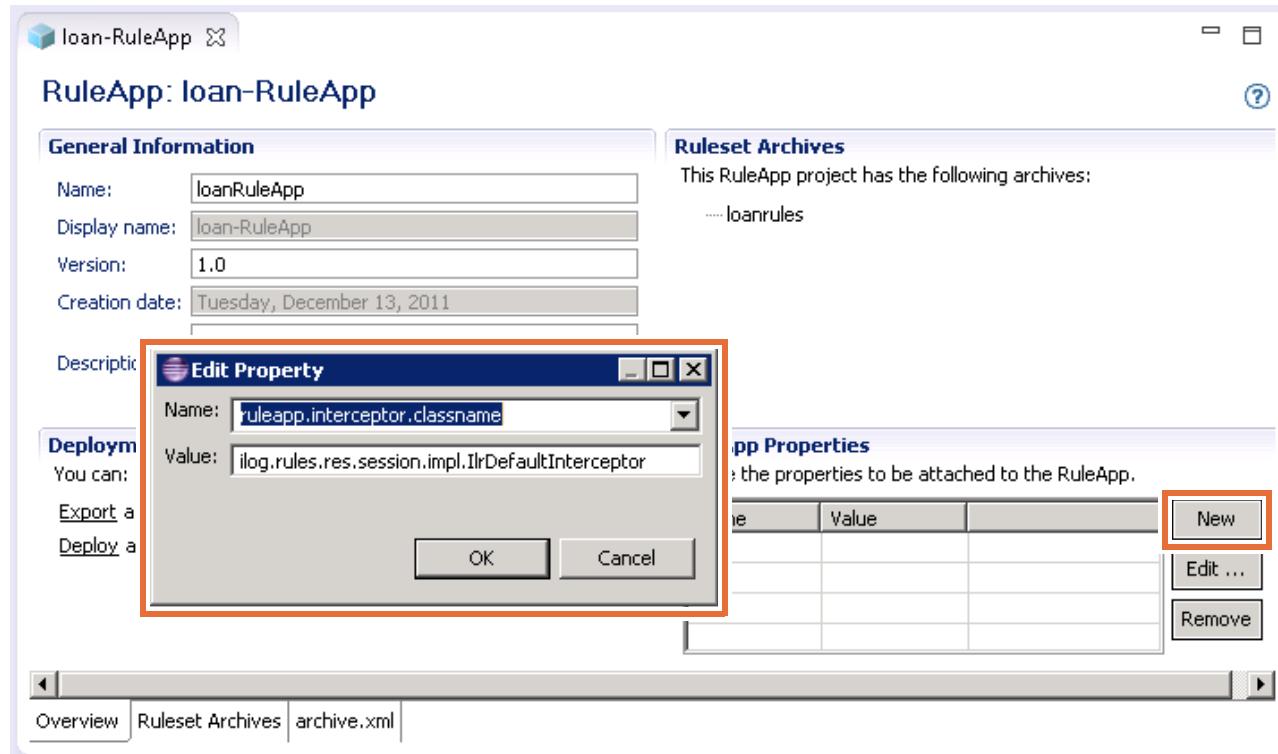
#### Note

This step is for you to explore the RuleApp editor only. You delete the property after you see how to use it.

- \_\_\_ a. In the **RuleApp Properties** section, click **New**.
- \_\_\_ b. In the list next to the **Name** field, select the `ruleapp.interceptor.classname` property.

The **Value** field is automatically set by default to:

`ilog.rules.res.session.impl.IlrDefaultInterceptor`



- \_\_\_ c. Click **OK** to keep the default value, and press **Ctrl+S** to save your work.
- \_\_\_ 5. In the RuleApp Editor, click the **archive.xml** tab for the **loan-RuleApp** to look for the new `ruleapp.interceptor.classname` property that is added to the XML.
- \_\_\_ 6. Return to the **Overview** tab, and delete the `ruleapp.interceptor.classname` RuleApp property.
  - \_\_\_ a. Click the `ruleapp.interceptor.classname` RuleApp property in the RuleApp Properties section on the **Overview** tab.
  - \_\_\_ b. Click **Remove**.



- \_\_\_ c. Save your work (**Ctrl+S**).

If you reopen the **archive.xml** tab, you see that the XML definition of the RuleApp property is gone.

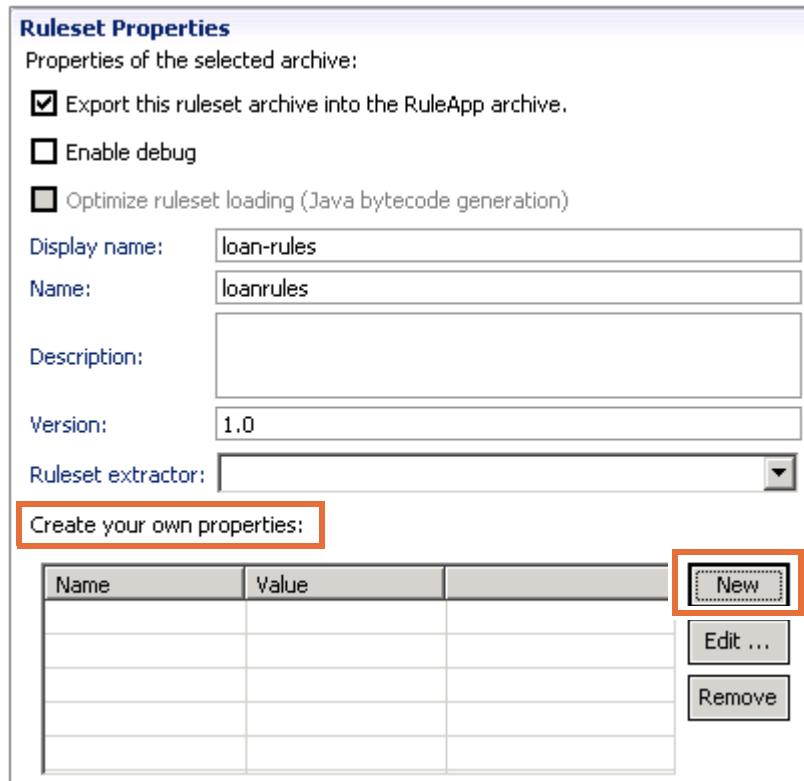
### 1.3. Adding a ruleset property to a ruleset

In this section, you add a ruleset property to the `loanrules` ruleset that is packaged in the RuleApp. A RuleApp can contain several rulesets, but this RuleApp contains only one.

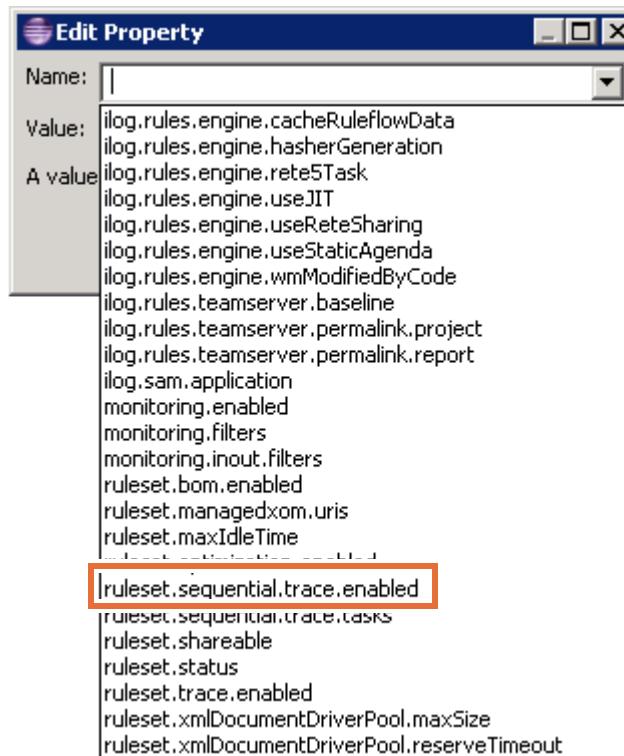
- 1. In the RuleApp Editor, click the **Ruleset Archives** tab.
- 2. In the Ruleset Archives pane, click **loanrules**.

After you select the `loanrules` ruleset, the ruleset data opens in the Ruleset Properties section of the editor so you can add or modify properties.

- 3. In the Ruleset Properties section, add a property:
  - a. Under the “Create your own properties” section, click **New**.



- \_\_\_ b. In the Edit Property window that opens, scroll through the names of possible ruleset properties in the list that is next to the **Name** field and select the **ruleset.sequential.trace.enabled** ruleset property.



The names that are listed are names of predefined ruleset properties. Each ruleset property has a specific role, which is described in the product documentation.

- \_\_\_ c. In the **Value** field, type: `true`
- \_\_\_ d. Click **OK** to close the Edit Property window.
- \_\_\_ e. Save your work (**Ctrl+S**).
- \_\_\_ 4. Open the **archive.xml** tab to find the XML definition of the ruleset property:

```
<ruleset-property>
 <ruleset-property-name>ruleset.sequential.trace.enabled</ruleset-property-name>
 <ruleset-property-value>true</ruleset-property-value>
</ruleset-property>
```

- \_\_\_ 5. Delete `ruleset.sequential.trace.enabled`.
- \_\_\_ a. Select this ruleset property in the Ruleset Properties section of the **Ruleset Archives** tab.
- \_\_\_ b. Click **Remove**.
- \_\_\_ c. Save your work.

When you click the **archive.xml** tab, you can see that the XML definition of the ruleset property is no longer visible in the XML code of the ruleset archive.

- \_\_\_ 6. Close the RuleApp editor.

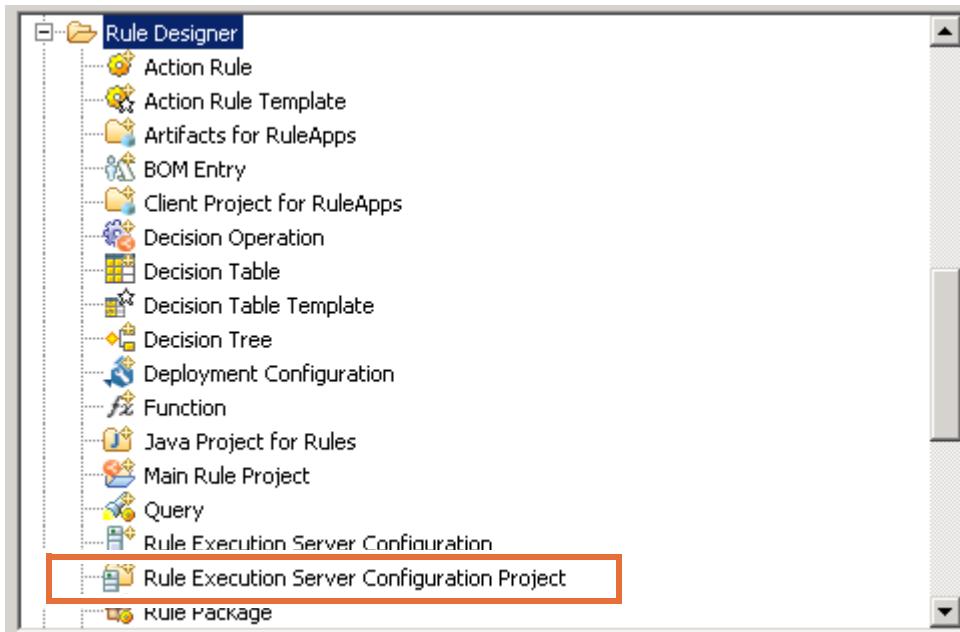
## Section 2. Creating deployment configurations and deploying from Rule Designer

In this section, you work through the following tasks to learn how to create deployment configurations and deploy RuleApps from Rule Designer.

- "Creating a configuration for deployment to WebSphere Application Server"
- "Deploying the RuleApp from Rule Designer"

### 2.1. Creating a configuration for deployment to WebSphere Application Server

1. In Rule Designer, on the **File** menu, click **New > Other**.
2. Scroll down through the list to select **Rule Designer > Rule Execution Server Configuration Project**, and click **Next**.



The Server Configuration wizard opens.

3. In the Server Configuration wizard, complete the deployment configuration details.
  - a. In the **Project name** field of the New Rule Execution Server Configuration Project page, type: loan-RESConfigs
  - b. Make sure that **Use default location** is selected and click **Next**.
  - c. On the Configure Rule Execution Server page, make sure that **an application server** and **IBM WebSphere AS V8.5** are selected, and click **Next**.
  - d. On the Configuration Name page, keep the default value for the name: IBM WebSphere AS 8.5
  - e. In the **Installation directory** field, either click **Browse** and browse to the installation folder of WebSphere Application Server V8.5.5, or type the path directly, and click **OK**.

The default installation path is:

C:\Program Files\IBM\ODM871\WAS\AppServer

- \_\_\_ f. Leave the **Deployment directory** field empty.

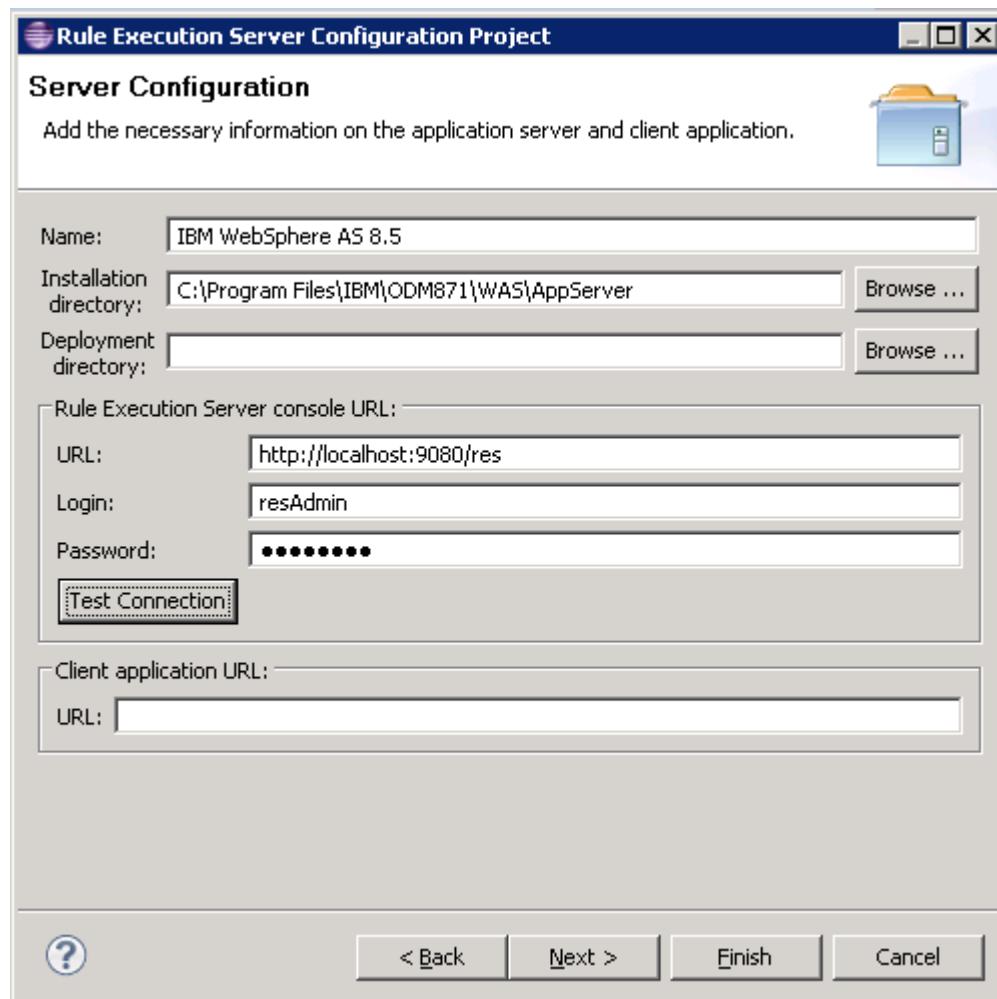
The value of this field is not required if Rule Execution Server is hosted in WebSphere Application Server, as is the case in this course.

- \_\_\_ g. In the **URL** field, enter: http://localhost:9080/res

Make sure that you use the correct port number for your environment. The default port is 9080.

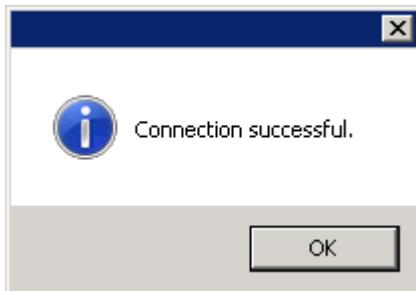
- \_\_\_ h. In the **Login** field and in the **Password** field, enter: resAdmin

- \_\_\_ i. Leave the **Client application URL** field empty.



- \_\_\_ j. Click **Test Connection** to verify your settings.

You see a window that indicates whether the connection is successful.



## Troubleshooting

If the connection test fails, verify the values of the **URL**, **Login**, and **Password** fields, and use the received error message to correct the problem. If the port is indicated as faulty, see "Ports" on page -xviii. Then, try again until the connection succeeds.

Also, make sure that the sample server is running.

- \_\_\_ k. Click **OK** to close the connection test window.
- \_\_\_ l. Click **Next** to open the RuleApp Deployment page of the wizard.
- \_\_\_ m. On the RuleApp Deployment page, make sure that **to the Rule Execution Server Console** is selected and click **Finish**.

The `IBM WebSphere AS 8.5.esc` Rule Execution Server Configuration is created in the `loan-RESConfigs` Rule Execution Server Configuration project.

- \_\_\_ 4. In Rule Explorer, expand the **loan-RESConfigs** folder and verify that it contains the new Rule Execution Server configuration: `IBM WebSphere AS 8.5.esc`



## Note

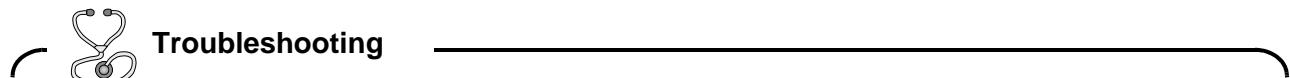
The Rule Execution Server name, the Rule Execution Server console URL, and the client application URL are stored in a `<servername>.esc` file in the Rule Execution Server configuration project directory. The login ID and password are stored in a `configurations.xml` file in the `.metadata\plugins\ilog.rules.studio.res\` directory in your workspace.

## 2.2. Deploying the RuleApp from Rule Designer

In this section, you deploy the RuleApp to Rule Execution Server deployed on IBM WebSphere Application Server V8.5.5.

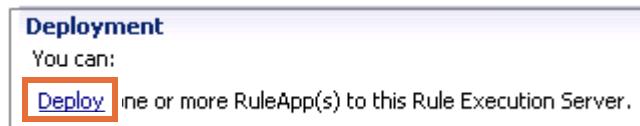
- \_\_\_ 1. If the configuration is not already open, double-click the `IBM WebSphere AS 8.5.esc` in the **loan-RESConfigs** folder to open it.
- \_\_\_ 2. In the **Rule Execution Server Console** section, make sure that the **Login** and **Password** fields are set to `resAdmin` and save your work.

- \_\_\_ 3. Deploy the loan-RuleApp RuleApp by using the IBM WebSphere AS 8.5.esc Rule Execution Server configuration.



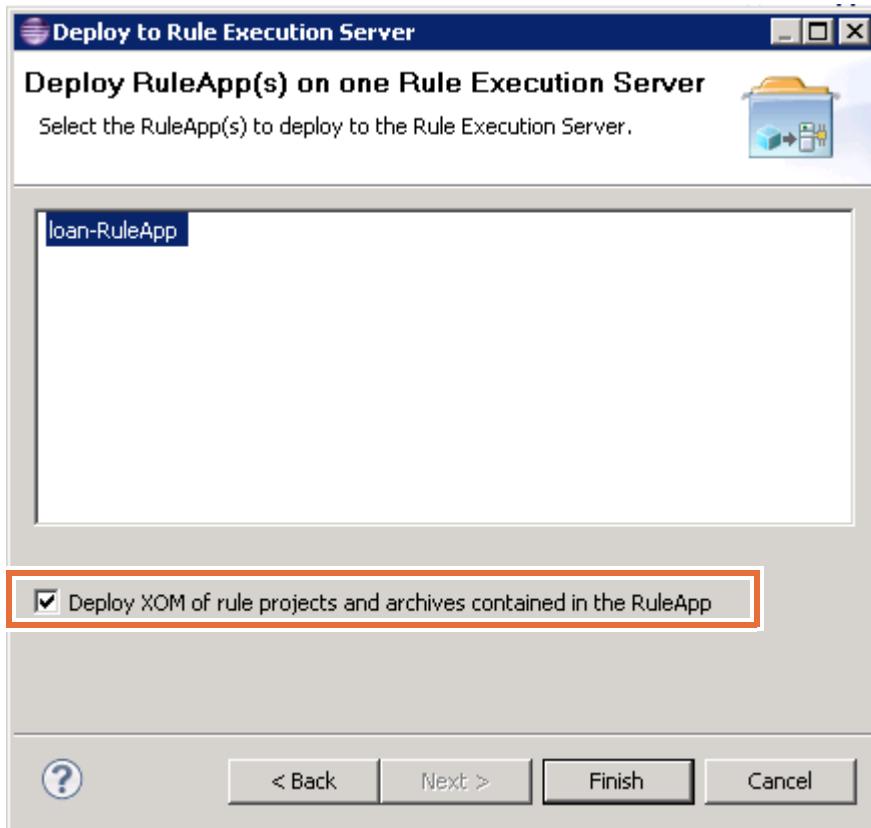
If, during this step, you get a Java version notification, select the **Do not show this message again** option and click **OK**.

- \_\_\_ a. In the **Deployment** section of the IBM WebSphere AS 8.5.esc Rule Execution Server configuration, click **Deploy**.



The deployment wizard opens.

- \_\_\_ b. Keep the **Increment RuleApp major version** option selected and click **Next** to keep the default deployment type.
- \_\_\_ c. Select **loan-RuleApp** and make sure that the **Deploy XOM of rule projects and archives contained in the RuleApp** option is selected.



- \_\_\_ d. Click **Finish**.

- \_\_\_ e. Look at the new traces in the console view in Rule Designer:

The "loan-RuleApp" RuleApp project was successfully deployed on the "IBM WebSphere AS 8.5" configuration.

```
/loanRuleApp/1.0 -> /loanRuleApp/1.0: Element added
/loanRuleApp/1.0/loanrules/1.0 -> /loanRuleApp/1.0/loanrules/1.0:
Element added
XOM Deployed : resuri://loan-xom.zip/1.0
```

## Section 3. Deploying a RuleApp from Decision Center

In this section, you work through these tasks to understand deployment from Decision Center.

- "Publishing your rule project to Decision Center"
- "Creating a RuleApp in Decision Center"
- "Deploying a RuleApp from Decision Center"

To avoid synchronization conflicts during this exercise, you republish the project as a new project in Decision Center.

### 3.1. Publishing your rule project to Decision Center

After completing Exercise 6, "Synchronizing across business and development environments", you deleted the project as described in "Erasing the project from Decision Center" on page 6-25. You now republish the project.

**To publish your updated rule project to Decision Center:**

- 1. In the Rule Explorer, right-click the **loan-rules** project and click **Decision Center > Connect**.

The Decision Center configuration wizard opens.
- 2. Perform the following actions in the Connection section of the Decision Center configuration wizard:
  - a. In the **URL** field, enter: `http://localhost:9080/teamserver`

Make sure that you use the correct port for your environment.
  - b. In the **User name** and **Password** fields, enter: `rtsAdmin`
  - c. Leave the **Data source** field empty, which is the default value.
  - d. Click **Connect**.

After the connection is successfully established, the "Project configuration" section is enabled.
  - e. In the "Project configuration" section, select the **Create a new project on Decision Center** option because the `loan-rules` project should not exist on Decision Center.
  - f. Click **Finish**.
  - g. Click **No** when you are asked to switch to the Team Synchronizing perspective.
  - h. Click **OK** to close the Synchronize Complete window.
- 3. Close the **IBM WebSphere AS 8.5** configuration editor.

## 3.2. Creating a RuleApp in Decision Center

In this section, sign in to Decision Center Enterprise console to deploy the `loan-rules` project.

- 1. Open the Decision Center Enterprise console.
  - a. Double-click the **Decision Center Enterprise console** desktop shortcut, or click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Decision Center Enterprise Console**.  
Alternatively, you can open a web browser at the address:  
`http://localhost:9080/teamserver`
  - b. Sign in to Decision Center with administrator privileges by using `rtsAdmin` for the user name and password.
- 2. On the **Home** tab, make sure that **Work on a rule project** is selected, and select the `loan-rules` project in the **Project in use** field.
- 3. Click the **Configure** tab and click **Manage RuleApps**.

## Configure

### Deployment

[Edit Ruleset Extractors](#)  
View and edit the list of extractors used to generate rulesets

[Manage RuleApps](#)  
Manage RuleApps, generate a RuleApp archive, deploy a RuleApp on a Rule Execution Server

[Manage Servers](#)  
Create, delete, and edit the servers on which you deploy your projects

### Security

[Edit Branch Security](#)  
Edit the security settings of the current project branches

[Edit Permissions](#)  
Change the rights that users of a given group have to access or modify data

[View Effective Permissions](#)  
View the effective permissions for a user belonging to several groups

The Available RuleApps page opens. You can use the features on this page to create or delete RuleApps, and deploy or redeploy existing RuleApps to Rule Execution Server.

- \_\_\_ 4. In the Available RuleApps page, click **New** to create a RuleApp for the `loan-rules` project.

The screenshot shows the 'Available RuleApps' page with a toolbar at the top containing buttons for New, Details, Edit, Delete, Deploy, Redeploy, Refresh, and Help. A mouse cursor is hovering over the 'New' button, which is highlighted with a blue border. Below the toolbar, there is a message 'No RuleApp found'.

The New RuleApp page opens.

- \_\_\_ 5. In the New RuleApp page, create the RuleApp.

- \_\_\_ a. In the **Name** field, enter: `loanRuleApp`
- \_\_\_ b. In the **Display Name** field, enter: `loanRuleApp from Decision Center`

Although you use the same RuleApp name, entering a different display name helps to differentiate this RuleApp from the one that you already deployed from Rule Designer.

- \_\_\_ c. Leave the **Major** field and the **Minor** field unchanged.

The screenshot shows the 'Properties' section of the New RuleApp page. It includes fields for Name (loanRuleApp), Display Name (loanRuleApp from Decision Cen), Major (0), and Minor (0). Below this is a 'Description' text area. The 'Rulesets' section shows a message 'No ruleset found' and contains three buttons: 'New' (highlighted with a red box), 'Edit', and 'Delete'.

- \_\_\_ d. In the Rulesets section, click **New** to create a ruleset in this RuleApp.

The NewRuleset page opens.

- \_\_\_ 6. In the NewRuleset page, create the ruleset.
- \_\_\_ a. In the **Name** field, enter: loanrules
  - \_\_\_ b. In the **Display Name** field, enter: loanrules from Decision Center
  - \_\_\_ c. In the **Project** field, select the loan-rules project from the list.
  - \_\_\_ d. Leave the other fields unchanged.

Notice that you can select the **Debug** option for this ruleset. Also, you can define Ruleset Properties on this page. You define these properties later in the course.

- \_\_\_ e. Click **Save** in the toolbar at the top of this page.

The screenshot shows the 'loanrules' Ruleset Properties page. At the top, there are 'Save' and 'Cancel' buttons. Below them is a section titled 'Properties' containing the following fields:

|                            |                                                                                      |
|----------------------------|--------------------------------------------------------------------------------------|
| <b>Name*</b>               | loanrules                                                                            |
| <b>Display Name</b>        | loanrules from Decision Center                                                       |
| <b>Description</b>         | (empty)                                                                              |
| <b>Project Type*</b>       | <input checked="" type="radio"/> Rule Project <input type="radio"/> Decision Service |
| <b>Project*</b>            | loan-rules                                                                           |
| <b>Baseline or Branch*</b> | main                                                                                 |
| <b>Extractor</b>           | <none>                                                                               |
| <b>Major</b>               | 1                                                                                    |
| <b>Minor</b>               | 0                                                                                    |
| <b>Enabled</b>             | <input checked="" type="checkbox"/>                                                  |
| <b>Debug</b>               | <input type="checkbox"/>                                                             |

Below the properties section is a 'Ruleset Properties' section with the message: 'No element of type 'Ruleset Property' found'. At the bottom are 'New', 'Edit', and 'Delete' buttons.

When the loanrules ruleset is created, you are returned to the New RuleApp page for loanRuleApp.

- \_\_\_ 7. When prompted that changes were made to the RuleApp, click **Save**.

The loanRuleApp RuleApp is now visible in the list of available RuleApps in Decision Center.

### 3.3. Deploying a RuleApp from Decision Center

In this section, you deploy the RuleApp that you created to Rule Execution Server.

- 1. While still on the **Configure** tab, select **loanRuleApp** in Available RuleApps and click **Deploy**.

The screenshot shows the 'Available RuleApps' page. At the top, there's a toolbar with buttons for New, Details, Edit, Delete, Deploy (which is highlighted with a red box), Redeploy, Refresh, and Help. Below the toolbar, there's a dropdown menu labeled 'Display by' set to '10'. A table lists rule apps, with one row selected: 'loanRuleApp' (Name), 'loanRuleApp from Decision Center 1' (Display Name), Major 1, Minor 0, Created On 5/22/15 3:41 PM, Created By rtsAdmin, and Last Modified 5/22/15 3:41 PM. The 'loanRuleApp' row has a red box around it.

The Deployment baseline pane opens.

- 2. In the Deployment Baseline pane, clear the **Create a baseline for this deployment** check box, as you do not require a baseline in this exercise, and then click **Next**.

The screenshot shows the 'Deployment Baseline' dialog box. It contains a single checkbox labeled 'Create a baseline for this deployment' which is unchecked. At the bottom are three buttons: 'Cancel', 'Previous', and 'Next'.

The RuleApp target pane opens.

- 3. In the RuleApp target pane, select **Deploy on a Rule Execution Server** and click **Next**.

The screenshot shows the 'RuleApp target' dialog box. It has two radio buttons: 'Deploy on a Rule Execution Server' (which is selected) and 'Generate a RuleApp archive'. At the bottom are three buttons: 'Cancel', 'Previous', and 'Next'.

The Versioning Policy pane opens.

- \_\_\_ 4. In the Versioning Policy pane, keep the default **Increment RuleApp major version** policy selected and click **Next**.



The Select Server pane opens.

- \_\_\_ 5. In the Select Server pane, keep the default **Sample** server, and click **Deploy**.



Decision Center deploys the RuleApp and its ruleset to Rule Execution Server.

- \_\_\_ 6. When deployment completes, verify that the version of the deployed RuleApp increased.

The screenshot shows a dialog box titled "Deployment Succeeded". It displays deployment details:

- RuleApp archive deployed: loanRuleApp
- Versioning Policy: Increment RuleApp major version
- Rule Execution Server: http://localhost:9080/res

Below this is a table titled "Archive content" with columns "Archive content", "Operation", and "Result".

| Archive content  | Operation                           | Result           |
|------------------|-------------------------------------|------------------|
| /loanRuleApp/1.0 | + Version changed and element added | /loanRuleApp/2.0 |
| /loanrules/1.0   | + Version changed and element added | /loanrules/1.0   |

At the bottom is a "Back" button.

**Questions**

Why did the major version of the RuleApp increase?

**Answer**

When you deployed the `loan-rules` project from Rule Designer in Section 1, "Working with RuleApps for deployment to Rule Execution Server", you created a `loanRuleApp` with version 1.0. During this deployment configuration, you set the "Increment RuleApp major version" policy to deploy an incremented version of the RuleApp.

**Note**

Depending on the number of times that you try to deploy the RuleApp during this exercise, you might see a different version number in your results. The main point of this exercise is to recognize how you can use version numbers to manage deployments.

- \_\_\_ 7. Click **Back** to return to the Available RuleApps page.

## Section 4. Viewing the deployed RuleApp in Rule Execution Server console

In this section, you explore the deployed RuleApp in Rule Execution Server console.

- \_\_\_ 1. Open the Rule Execution Server console.
  - \_\_\_ a. Double-click the **Rule Execution Server console** desktop shortcut, or click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Rule Execution Server console**.
  - \_\_\_ b. Sign in to the console as an administrator:
    - **User name:** resAdmin
    - **Password:** resAdmin
- \_\_\_ 2. In the Rule Execution Server console, examine the RuleApp that you deployed from Rule Designer.
  - \_\_\_ a. Click the **Explorer** tab and notice the RuleApps that you deployed are now listed in the RuleApps View, along with the `miniloanruleapp` that is delivered with the product.

| <input type="checkbox"/> Select All | Name            | Version |
|-------------------------------------|-----------------|---------|
| <input type="checkbox"/>            | loanRuleApp     | 1.0     |
| <input type="checkbox"/>            | loanRuleApp     | 2.0     |
| <input type="checkbox"/>            | miniloanruleapp | 1.0     |

- \_\_\_ b. Click version 1.0 of **loanRuleApp** to see its details.

You can see in the details of this RuleApp that the value of its **Display Name** field is:  
loan-RuleApp

- \_\_\_ c. Notice that no properties are set on this RuleApp.

If you click the **Show Properties** link, the field shows: **0 properties**.

| <input type="checkbox"/> Select All | Name      | Version |
|-------------------------------------|-----------|---------|
| <input type="checkbox"/>            | loanrules | 1.0     |

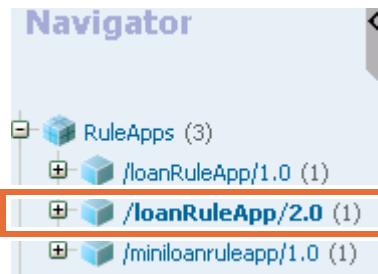
Ruleset 1 - 1 of 1

- \_\_\_ d. In the **Ruleset(s)** section, click **loanrules** to see the details for this ruleset.

The Ruleset View page opens for the `loanrules` ruleset. You can see in the details of this ruleset that the value of its **Display Name** field is:

`loan-rules`

- \_\_\_ e. In the **Show Properties** section for the ruleset, you also see that no properties are set on this ruleset.
- \_\_\_ 3. In the Navigator view, expand **RuleApps**, and click **/loanRuleApp/2.0** to examine the RuleApp that you deployed from Decision Center.



- \_\_\_ a. Notice that the value of its **Display Name** field is:

`loanRuleApp` from Decision Center

- \_\_\_ b. Notice that one property is set on this RuleApp that identifies this RuleApp as deployed from Decision Center: `ilog.rules.teamserver.mode`

| Hide Properties                                                  |        |
|------------------------------------------------------------------|--------|
| 1 properties                                                     |        |
| Name                                                             | Value  |
| <input type="checkbox"/> <code>ilog.rules.teamserver.mode</code> | deploy |
| properties 1 - 1 of 1                                            |        |
| prev 10 next 10                                                  |        |

- \_\_\_ c. In the **Ruleset(s)** section, click **loanrules** to see the details for this ruleset.

Notice that the value of its **Display Name** field is:

`loanrules` from Decision Center

4. In the Navigator view, click **Resources** and notice the Java XOM that you deployed from Rule Designer is listed as a .zip file.

The screenshot shows the 'Resources' section of the Rule Execution Server interface. At the top, it says 'Total Number of resources 5'. Below that, there's a table titled '5 Resource(s)' with columns for 'Select All', 'Name', and 'Version'. The table lists five entries:

| Select All               | Name                    | Version |
|--------------------------|-------------------------|---------|
| <input type="checkbox"/> | kpi.zip                 | 1.0     |
| <input type="checkbox"/> | loan-validation-xom.zip | 1.0     |
| <input type="checkbox"/> | loan-xom.zip            | 1.0     |
| <input type="checkbox"/> | loanvalidation-xom.zip  | 1.0     |
| <input type="checkbox"/> | miniloan-xom.zip        | 1.0     |

Resource 1 - 5 of 5

The loan-xom was deployed to Rule Execution Server when you deployed the RuleApp from Rule Designer and selected the **Deploy XOM of rule projects and archives contained in the RuleApp** option. This option makes it possible for you to manage the XOM model independently from the rules.



#### Information

When developers change the XOM, you should make sure that the updated XOM is redeployed to the Rule Execution Server.

You should also synchronize the rule project between Rule Designer and Decision Center to make sure that all updates are accessible to business users.



#### Note

You work more with the Rule Execution Server console in the next exercises.

5. Sign out of the Rule Execution Server console.

## Section 5. Deploying the client application to test ruleset execution

In this section, you work with Ant tasks in Rule Designer to deploy a client application. Every time that you run the application, the application sends a request for ruleset execution. By executing the ruleset, traces are generated that you can review in Decision Warehouse. This section includes these tasks:

- "Creating the client application archive file"
- "Deploying the web application"
- "Running the client application to test execution of the deployed RuleApp"

### 5.1. Creating the client application archive file

For this section, you return to Rule Designer and continue working with the same workspace to create the web application.

- \_\_\_ 1. Go back to Rule Designer.
- \_\_\_ 2. In Rule Designer, build the web application in the `loan-webapp` project.
  - \_\_\_ a. In Rule Explorer, expand the `loan-webapp` project, and double-click **common.xml** to open the file.
  - \_\_\_ b. Find the `wodm.home` property and make sure that it matches your installation directory path (`C:\Program Files\IBM\ODM871\ODM`), save the `common.xml` file if required, and close it.
  - \_\_\_ c. Right-click **build.xml** and click **Run As > Ant Build...**



#### Warning

Make sure that you click the **Ant Build...** option with the ellipsis (...).

Clicking the **Ant Build...** option brings up the Edit Configuration window, which you must use for this exercise.

The Edit Configuration window opens.

- \_\_\_ d. In the Edit Configuration window, make sure that **loanvalidation.ear [default]** is selected and click **Run**.

The Edit Configuration window closes.

The `loanvalidation.ear` target of the `build.xml` file runs and creates the `loanvalidation.ear` application file in the `loan-webapp\build` folder.

Wait for the `BUILD SUCCESSFUL` message in the console view of Rule Designer.

- \_\_\_ 3. Verify that the web application is created.
  - \_\_\_ a. In Rule Explorer, select the `loan-webapp` project and press F5 to refresh the content.

- \_\_\_ b. Expand the **loan-webapp** project and verify that the **build** folder is now visible.
- \_\_\_ c. Verify that the **build** folder contains the `loan-xom.jar` file and the `loanvalidation.ear` file.
  - The `loan-xom.jar` file is the Java archive file for the XOM. This file is an intermediate artifact that is required to build the `loanvalidation.ear` file.
  - The `loanvalidation.ear` file is the file that you must deploy to WebSphere Application Server for its execution.

## 5.2. Deploying the web application

Follow these instructions to deploy the web application.

- \_\_\_ 1. Right-click the `build.xml` file again and click **Run As > Ant Build....**



Make sure to click the **Ant Build** option with the ellipsis (...).

The Edit Configuration window opens.

- \_\_\_ 2. In the Edit Configuration window, deploy the web application.
  - \_\_\_ a. Clear `loanvalidation.ear [default]`.
  - \_\_\_ b. Select **deploy** and click **Run**.

The Edit Configuration window closes.

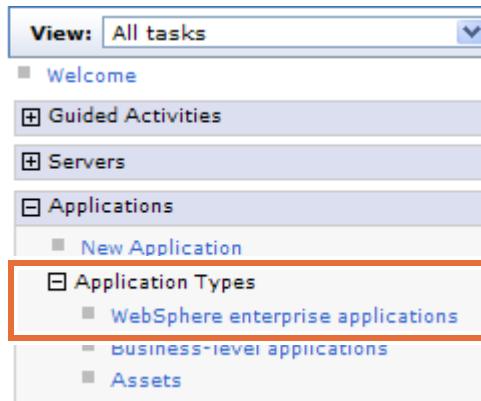
The `deploy` target of the `build.xml` file runs and deploys the `loanvalidation.ear` application file into WebSphere Application Server.

Deploying the application might take some time. Wait for the `BUILD SUCCESSFUL` message in the console view of Rule Designer:

```
LoanValidation successfully installed
BUILD SUCCESSFUL
```

- \_\_\_ 3. Sign in to the WebSphere Application Server administrative console to verify the application deployment.
  - \_\_\_ a. Click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Administrative console**.
  - \_\_\_ b. If prompted with a security warning, follow the browser instructions to continue to the website.
  - \_\_\_ c. Sign in with `odm` as the **User ID** and **Password**.

- \_\_\_ d. In the left pane, expand **Applications > Application Types**, and click **WebSphere enterprise applications**.



- \_\_\_ e. In the “Enterprise application” pane, verify that the `LoanValidation` application is present. Also, verify that its application status is started, which is marked with a green arrow in the **Application Status** column.

| Select                                      | Name                                        | Application Status |
|---------------------------------------------|---------------------------------------------|--------------------|
| You can administer the following resources: |                                             |                    |
| <input type="checkbox"/>                    | <a href="#">ILOG Rule Team Server</a>       |                    |
| <input type="checkbox"/>                    | <a href="#">LoanValidation</a>              |                    |
| <input type="checkbox"/>                    | <a href="#">ivtApp</a>                      |                    |
| <input type="checkbox"/>                    | <a href="#">jrules-res-htds-WAS85</a>       |                    |
| <input type="checkbox"/>                    | <a href="#">jrules-res-management-WAS85</a> |                    |

- \_\_\_ 4. Click **Logout** to exit the WebSphere Application Server console.

### 5.3. Running the client application to test execution of the deployed RuleApp

To test that your application can use the rules that you deployed, you run the application. If the application fails to complete, your RuleApp is not correctly deployed. If the application can run successfully and returns a decision, your deployment is correct.

- \_\_\_ 1. Open a web browser at the following web address:

`http://localhost:9080/LoanValidation`

Make sure that you use the correct port for your environment.

- \_\_\_ 2. Look at the different scenarios on the first page:

- The first scenario has an amount of 100,000. The loan is approved.
- The second scenario has an amount of 200,000. The loan is rejected because the debt-to-income ratio is too high.
- The third scenario has a Social Security Number (SSN) with letters instead of digits, and a birth year of 1768. The loan is rejected because of invalid input data.

\_\_\_ 3. Click **Start loan validation** at the top of the page.

The form to enter the borrower information opens.

\_\_\_ 4. Keep the default values and click **Next Step**.

The form to enter the loan information opens.

\_\_\_ 5. Keep the default values and click **Calculate loan**.

The **Loan Report** page opens with the result of the execution of your ruleset.

## Section 6. Troubleshooting RuleApp deployment from Decision Center

In some cases, ruleset execution fails on Rule Execution Server when the RuleApp is deployed from Decision Center. However, the same RuleApp executes successfully when deployed from Rule Designer. If this situation occurs, you can try clearing the Decision Center cache.

ILOG Rule Language (IRL) files are generated when you create rulesets. They are cached on your server in the location that is specified in the `preferences.properties` file of the `<InstallDir>\lib\jrules-teamserver.jar` file (`/ilog/rules/teamserver/preferences.properties`). Over time, these files can become obsolete. Also, you might want to modify the way the IRL is generated. In these cases, it is suggested to clean the cache.

### Cleaning the cache

- 1. If you closed Decision Center Enterprise console, sign in again with `rtsAdmin` as the user name and password.
- 2. On the **Home** tab, make sure that **Work on a rule project** is selected, and that **loan-rules** is the project in use.
- 3. On the **Configure** tab, in the Administration section, click **Clean Decision Center Cache**.

**Administration**

[Installation Settings Wizard](#)  
Modify an existing installation of Decision Center

[Diagnostics](#)  
Run diagnostics to check the Decision Center system

**Clean Decision Center Cache**  
Cleans the cache generated by the ruleset generation

[Import Projects](#)  
Import a .zip file containing one or more projects

[Export Current Project State](#)  
Export and download the current project for the selected branch or baseline

[Erase Current Project](#)  
Erase the current project, its branches, and its history. This operation cannot be undone

The files that are cached on the server for the current project are deleted.

- 4. Click **Back** to return to the **Configure** tab.
- 5. Sign out and close Decision Center Enterprise console.



### Information

For information about changing configuration properties in the `preferences.properties` file, see Configuration parameter maintenance in the product documentation:

[http://www.ibm.com/support/knowledgecenter/SSQP76\\_8.7.1/com.ibm.odm.dcenter.bu.econsole/topics/con\\_config\\_install\\_param.html](http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.dcenter.bu.econsole/topics/con_config_install_param.html)

**End of exercise**

## Exercise review and wrap-up

The first part of the exercise looked at how to configure deployment and deploy RuleApps from Rule Designer and from Decision Center. Then, you learned how to view deployed RuleApps in the Rule Execution Server console.



# Exercise 8. Exploring the Rule Execution Server console

## What this exercise is about

This exercise teaches you how to work with the Rule Execution Server console.

## What you should be able to do

After completing this exercise, you should be able to:

- Work with Rule Execution Server console tools
- Manage RuleApps and rulesets through the Rule Execution Server console

## Introduction

After you deploy RuleApps and XOMs to Rule Execution Server, you can manage them through the Rule Execution Server console.

In this exercise, you explore the Rule Execution Server console environment and features.

This exercise continues from the same workspace that was used during Exercise 7, "Managing deployment". If you encountered any issues during that exercise, you should switch to a new workspace and import the project that is listed in the instructions for this exercise. However, to avoid issues, the exercise instructions prompt you to start in a new workspace.

The exercise is divided into these sections:

- Section 1, "Exploring the Rule Execution Server console"
- Section 2, "Exploring the deployed RuleApps"
- Section 3, "Working with deployed resources"
- Section 4, "Exploring the Diagnostics and Server Info tabs"
- Section 5, "Managing RuleApps and rulesets"
- Section 6, "Using the REST API to manage resources"

## Requirements

You should complete Exercise 7, "Managing deployment" before starting this exercise.

## Section 1. Exploring the Rule Execution Server console

You can continue working in your current workspace if you completed Exercise 7, "Managing deployment" successfully. Otherwise, you can follow the instructions to switch workspaces for this exercise.

### 1.1. Setting up your environment for this exercise

- 1. If the sample server is not started, start it now by double-clicking the **Start server** desktop shortcut or by going to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server**.

Starting the sample server might take several minutes.

- 2. In Rule Designer, if you completed Exercise 7, "Managing deployment" successfully, go to Section 1.2, "Exploring the Rule Execution Server console pages". Otherwise, you can switch to the workspace that is provided for this exercise.

To switch to a new workspace:

- a. From the **File** menu, click **Switch Workspace > Other**.
- b. In the **Workspace Launcher** dialog box, enter the path:  
`<TrainingDir>\workspaces\res`
- c. Close the **Welcome** tab.
- 3. Import the project **Ex08: Exploring the Rule Execution Server console > 01-start** by using the Samples Console perspective.
  - a. Click the **Open Perspective** icon in the toolbar.
  - b. In the Open Perspective window, select **Samples Console**, and click **OK**.
  - c. On the **Samples and Tutorials** tab, expand **Rule Designer > Training > Ex08: Exploring the Rule Execution Server console**.
  - d. Under **01-start**, click **Import projects**.
  - e. When the workspace is finished building, close the **Help** tab.

### 1.2. Exploring the Rule Execution Server console pages

- 1. Open Rule Execution Server console, if it is not already open.
  - a. Double-click the **Rule Execution Server console** desktop shortcut, or click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Rule Execution Server console**.
  - b. In both the **User Name** and **Password** fields, enter: `resAdmin`
- 2. Note the tabs: **Home**, **Explorer**, **Decision Warehouse**, **Diagnostics**, **Server Info**, and **REST API**.
- 3. Click the **Explorer** tab.

You can use the Navigator pane on the left side of the console window to access the elements that you can manage in the Rule Execution Server console:

- The **RuleApps** link gives access to the RuleApps View pane, where you can manage the deployed RuleApps.
- The **Resources** link gives access to the Resources View pane, where you can manage the managed resources.
- The **Libraries** link gives access to the Libraries View pane, where you can manage the managed libraries.
- The **Service Information** link gives access to the Transparent Decision Service Information View, where you can manage the created transparent decision services.

By default, the Explorer page opens with the RuleApps View pane visible, and you can see the RuleApps that you deployed in Exercise 7, "Managing deployment".

## Section 2. Exploring the deployed RuleApps

In this section, you explore the RuleApps deployed in Rule Execution Server, and relate them to what you did in Exercise 7, "Managing deployment".



### Note

Depending on the number of deployments that you tried before doing this exercise, the version numbers that you see in the Rule Execution Server console might differ from the versions in these instructions.

### Exploring the RuleApp deployed from Rule Designer

- \_\_\_ 1. In the Navigator pane, expand **RuleApps**.

You are looking for the last RuleApp that you deployed in "Deploying the RuleApp from Rule Designer" on page 7-12.

- \_\_\_ 2. In the Navigator pane, expand **RuleApps** and click **loanRuleApp/1.0** to open this RuleApp.
- \_\_\_ 3. Inspect the RuleApp View pane.

The **Display Name** field indicates `loan-RuleApp`.

This display name is the name for the RuleApp project in Rule Designer, which you used to deploy this RuleApp.

- \_\_\_ 4. Click the **loanrules** ruleset to open it, and explore its properties.

The Ruleset View pane opens, where you can see the `borrower`, `loan`, and `report` ruleset parameters that are defined for this ruleset.

- \_\_\_ 5. Click **Show Managed URIs**.

| Hide Managed URIs        |            |       |                                        |
|--------------------------|------------|-------|----------------------------------------|
| 1 Managed URIs           |            |       |                                        |
|                          | Select All | Index | URI                                    |
| <input type="checkbox"/> |            | 1     | <code>resuri://loan-xom.zip/1.0</code> |
| Managed URIs 1 - 1 of 1  |            |       |                                        |
| prev 10 next 10          |            |       |                                        |

You can see that this ruleset is associated with the `loan-xom.zip` XOM, version 1.0. This URI corresponds to the XOM that you deployed in "Deploying the RuleApp from Rule Designer" on page 7-12.

You work with this XOM in Section 3, "Working with deployed resources".

### 2.1. Exploring the RuleApp deployed from Decision Center

- \_\_\_ 1. In the Navigator pane, click **loanRuleApp/2.0** to open this RuleApp.

You are looking for the RuleApp that you deployed in "Deploying a RuleApp from Decision Center" on page 7-19.

- 2. In the RuleApp View pane, notice that the **Display Name** field indicates `loanRuleApp` from Decision Center.

This display name is the name that you gave to this RuleApp when you deployed it from Decision Center in "Deploying a RuleApp from Decision Center" on page 7-19.

- 3. Click the **loanrules** ruleset to open it, and explore its properties.

The Ruleset View pane opens. Notice that the **Display Name** field indicates `loanrules` from Decision Center.

You can see that the same `borrower`, `loan`, and `report` ruleset parameters that you saw in `loanRuleApp/1.0` are also defined for this ruleset.

- 4. Click **Show Properties** and notice that four properties are associated with this ruleset:

- `ilog.rules.teamserver.baseline`
- `ilog.rules.teamserver.permalink.project`
- `ilog.rules.teamserver.permalink.report`
- `ruleset.bom.enabled`



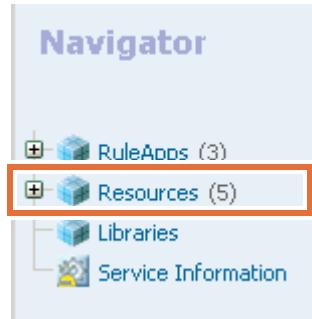
### Information

These properties are defined for this RuleApp because you deployed it from Decision Center. You learn more about these properties in Exercise 9, "Auditing ruleset execution through Decision Warehouse".

## Section 3. Working with deployed resources

In this section, you explore the XOM resources that are deployed in Rule Execution Server, and relate them to what you did in Exercise 7, "Managing deployment".

- 1. In the Navigator pane, click **Resources**.



- 2. In the Resource View, click **loan-xom.zip** (version 1.0).

The screenshot shows the 'Resources View' interface. At the top, there are buttons for 'Deploy Resource' and 'Clean up Resources'. Below that, a summary says 'Total Number of resources 5'. A table lists '5 Resource(s)'. The table has columns: 'Select All', 'Name', 'Version', and 'Creation Date'. The row for 'loan-xom.zip' version 1.0 is highlighted with a red box. The table also includes rows for 'kpi.zip', 'loan-validation-xom.zip', 'loanvalidation-xom.zip', and 'miniloan-xom.zip'. At the bottom, it says 'Resource 1 - 5 of 5' and has navigation links 'prev 10 next 10'.

| Select All               | Name                    | Version | Creation Date                      |
|--------------------------|-------------------------|---------|------------------------------------|
| <input type="checkbox"/> | kpi.zip                 | 1.0     | Apr 17, 2015 11:10:29 AM GMT-07:00 |
| <input type="checkbox"/> | loan-validation-xom.zip | 1.0     | Apr 17, 2015 11:10:30 AM GMT-07:00 |
| <input type="checkbox"/> | loan-xom.zip            | 1.0     | May 22, 2015 3:37:07 PM GMT-07:00  |
| <input type="checkbox"/> | loanvalidation-xom.zip  | 1.0     | Apr 17, 2015 11:10:29 AM GMT-07:00 |
| <input type="checkbox"/> | miniloan-xom.zip        | 1.0     | Apr 17, 2015 11:10:26 AM GMT-07:00 |

- 3. Click **Show references from Rulesets** to see the list of rulesets that reference this XOM.

You see the reference points to the `loanrules` rulesets from `loanRuleApp` versions 1.0 and 2.0.

If you deploy a RuleApp without an associated XOM, you can manually associate this XOM in Rule Execution Server console through a ruleset property. You see how to do that in Section 5.3, "Adding a managed XOM to your ruleset".

## Section 4. Exploring the Diagnostics and Server Info tabs

In this section, you explore the Diagnostics page.

- \_\_\_ 1. Click the **Diagnostics** tab.



### Diagnostics View



- \_\_\_ 2. Click **Run Diagnostics**, and take some time to inspect the results.

Run Diagnostics is the same tool that you used during Exercise 2, "Configuring Rule Execution Server on WebSphere Application Server".

- \_\_\_ 3. Click the **Server Info** tab.



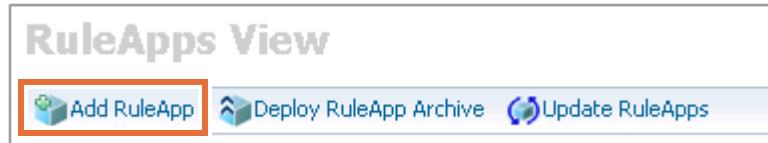
- \_\_\_ 4. Inspect the Server Info page, and view the messages for the sample server.

## Section 5. Managing RuleApps and rulesets

In this section, you learn the basics of RuleApp and ruleset management with the Rule Execution Server console. You can use the Rule Execution Server console to create, edit, and delete RuleApps and rulesets.

### 5.1. Creating a RuleApp

- \_\_ 1. Click the **Explorer** tab.
- \_\_ 2. In the RuleApps View, click **Add RuleApp**.



- \_\_ 3. In the New RuleApp pane, leave the **Name** field set to: NewRuleApp
- \_\_ 4. In the **Version** field, keep: 1.0
- \_\_ 5. In the **Display Name** field, enter: Test RuleApp
- \_\_ 6. Click **Add**.



The RuleApp View now shows the properties of the NewRuleApp/1.0 RuleApp.

### 5.2. Adding a ruleset to your RuleApp

- \_\_ 1. Add a ruleset to the new NewRuleApp.
  - \_\_ a. In the RuleApp View pane, click **Add Ruleset**.



The New Ruleset pane opens.

- \_\_ b. In the **Name** field, keep: NewRuleset
- \_\_ c. In the **Version** field, keep: 1.0
- \_\_ d. In the **Display Name** field, enter: Test Ruleset
- \_\_ e. Click **Browse** next to **Local path of Ruleset Archive**, and select the rulesetArchive.jar file from your Rule Designer workspace directory:  
`<TrainingDir>\workspaces\res\loan-rules\rulesetArchive.jar`

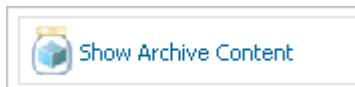
In the VMware image that is created for this course, <TrainingDir> is C:\labfiles.



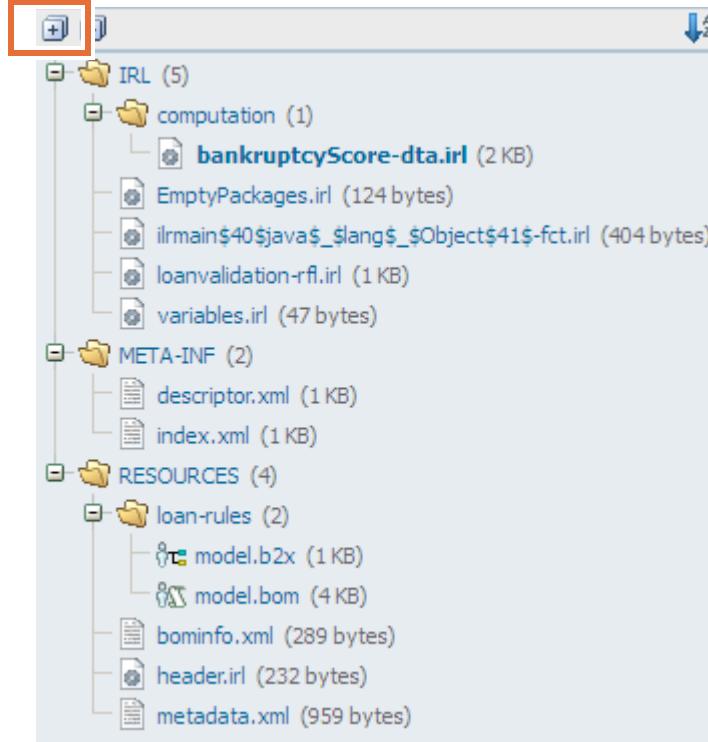
## Troubleshooting

If you do not see the rulesetArchive.jar file in the **loan-rules** folder, make sure that **All Files (\*.\*)** is selected from the file types list.

- \_\_ f. After you select the rulesetArchive.jar file in the “Choose File to Upload” window, click **Open**.
  - \_\_ g. Back in the New Ruleset window, leave the other fields unchanged, and click **Add**.  
The `NewRuleApp/1.0/NewRuleset/1.0` ruleset is now created.
- 2. In the Ruleset View page for the `NewRuleApp/1.0/NewRuleset/1.0` ruleset, scroll down the page and click **Show Archive Content**.



3. Expand the folders to explore the content of the ruleset archive.



- The **IRL** folder contains the IRL version of all the rule artifacts in the ruleset.
- The **META-INF** folder contains the `descriptor.xml` and the `index.xml` files.
  - The `descriptor.xml` file contains the properties of the ruleset (name, ruleset signature, version).
  - The `index.xml` file contains the indexes of the ruleset, that is, the names of the different files that constitute this ruleset.
- The **RESOURCES** folder contains the definition of the business object model, and the definition of the rule artifact properties.

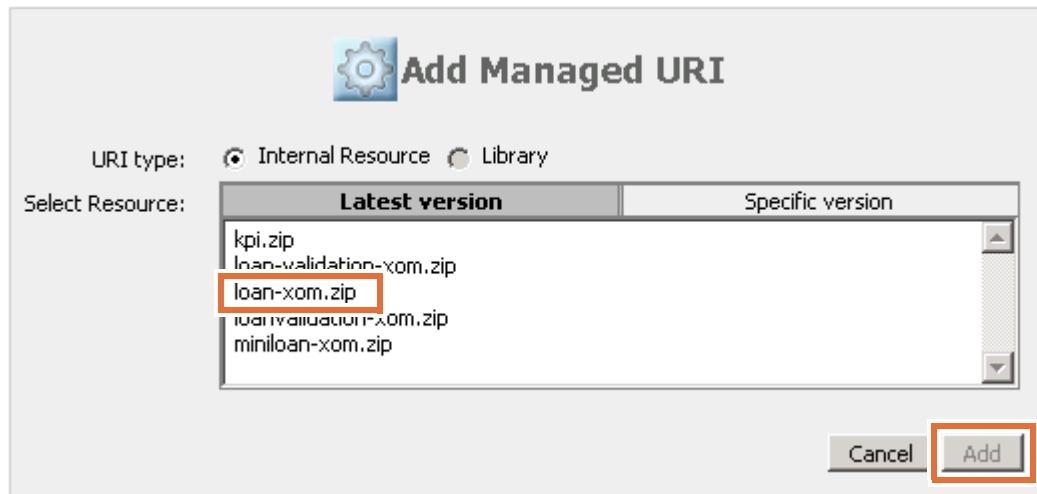
### 5.3. Adding a managed XOM to your ruleset

1. On the toolbar of the Ruleset View page, click **Add Managed URI**.



The Add Managed URI window opens with two tabs: **Latest version** and **Specific version**. The most recent resources are listed on the **Latest version** tab.

- \_\_ 2. On the **Latest version** tab of the Add Managed URI window, select **loan-xom.zip** and click **Add**.



- \_\_ 3. In the Ruleset View page, click **Show Managed URIs**.



The URI `resuri://loan-xom.zip` is now visible in the list of managed XOMs associated with the ruleset.

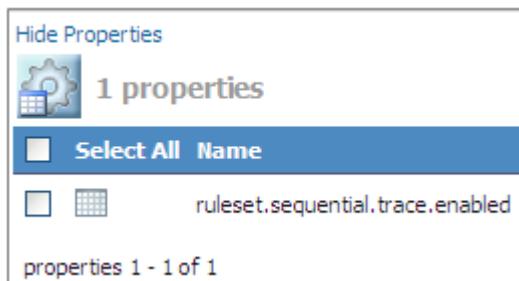
- \_\_ 4. View the references, as you did in Section 3, "Working with deployed resources".
- \_\_ a. On the Navigator page, click **Resources**.
  - \_\_ b. In the Resource View, click **loan-xom.zip**.
  - \_\_ c. Click **Show references from Rulesets** to see the list of rulesets that depend on this XOM.

This time, the list includes your new ruleset.

## 5.4. Adding a ruleset property to the ruleset

- \_\_ 1. Return to the Ruleset View page for your `NewRuleset` ruleset.
  - \_\_ a. In the Navigator, expand **RuleApps > /NewRuleApp/1.0**.
  - \_\_ b. Click **/NewRuleset/1.0**.
- \_\_ 2. On the toolbar, click **Add Property**.

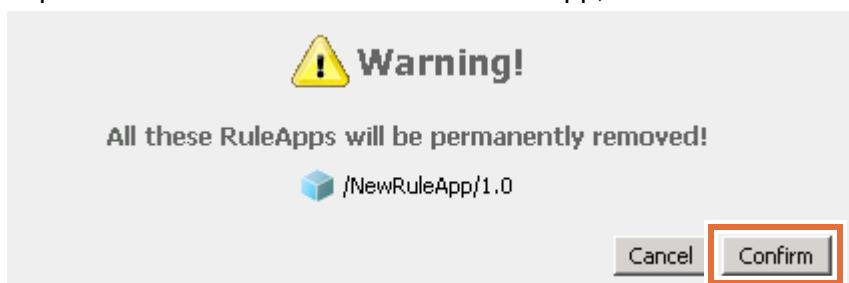
- \_\_\_ 3. Add the `ruleset.sequential.trace.enabled` property, and set its value to `true`.
  - \_\_\_ a. In the New Ruleset Property window, click the **Name** menu and select `ruleset.sequential.trace.enabled` from the list.
  - \_\_\_ b. In the **Value** field, delete the existing value and type: `true`
  - \_\_\_ c. Click **Add**.
- \_\_\_ 4. On the Ruleset View page, click **Show Properties** to view the ruleset properties.



You learn about the monitoring options in Exercise 9, "Auditing ruleset execution through Decision Warehouse".

## 5.5. Deleting the RuleApp

- \_\_\_ 1. Make sure that you are on the **Explorer** tab.
- \_\_\_ 2. In the Navigator, click **RuleApps**.
- \_\_\_ 3. In the list of RuleApps, and in the RuleApp view, select **NewRuleApp** and click **Remove**.
- \_\_\_ 4. When prompted to confirm the removal of the RuleApp, click **Confirm**.



This RuleApp is not required for the rest of the course.

## Section 6. Using the REST API to manage resources

You can use the REST API tab to manage resources through HTTP. REST resources include RuleApps, rulesets, XOM libraries, and XOM resources.

To use the REST API tool, you select a resource type, click a method name, and pass the appropriate parameters. When you call the method, the resulting request and response are shown immediately.

- \_\_\_ 1. In the Rule Execution Server console, click the **REST API** tab to see the test tool.



- \_\_\_ 2. Explore the **REST API** tab by clicking the tab for each resource and noting which methods are available:

- /ruleapps
- /rulesets
- /libraries
- /xoms

**REST API tool**

You can use this test tool to test the REST API for resource management. To test the REST API REST API WADL file: </res/api/auth/v1/DecisionServer.wadl>

**/ruleapps    /rulesets    /libraries    /xoms**

**GET /ruleapps**  
getRuleApps Returns all the RuleApps contained in the repository.

**GET /ruleapps?count=true**  
getCountOfRuleApps Counts the number of elements in this list.

**POST /ruleapps**  
deployRuleAppArchive Deploys a RuleApp archive in the repository, based on the merging and version

**POST /ruleapps**  
addRuleApp Adds a new RuleApp in the repository. The RuleApp representation is passed in the request body. It contains a specific error description and the HTTP status 202 is returned.

- \_\_\_ 3. Deploy a RuleApp and ruleset.



## Troubleshooting

For this part of the exercise, if you have problems with the Internet Explorer browser, you can switch to Mozilla Firefox. Type the URL for Rule Execution Server directly in the address field.

- a. Open the **/ruleapps** tab.
- b. Click anywhere on the **POST** method path for **addRuleApp**.

The screenshot shows a browser interface with a green 'POST' button and a light blue background. Below it, a red box highlights the 'addRuleApp' button. A tooltip below the button reads: 'Adds a new RuleApp in the repository.'

This action opens the request and response elements, including the Request Body section.

- c. In the **application/xml** field of the Request Body section, replace the following RuleApp and ruleset values, including the braces ({}), with your own values.

- <name>{RuleApp name}</name>
- <version>{RuleApp version}</version>
- <displayName>{RuleApp display name}</displayName>
- <description>{Ruleset name}</description>
- <name>{Ruleset name}</name>
- <version>{Ruleset version}</version>
- <displayName>Ruleset display name}</displayName>
- <description>{Ruleset name}</description>

For example, you can use these values:

```
<ruleApp>
 <name>myRestRuleApp</name>
 <version>1.0</version>
 <displayName>My REST RuleApp</displayName>
 <description></description>
 <rulesets>
 <ruleset>
 <name>myTestRESTruleset</name>
 <version>1.0</version>
 <displayName>My REST ruleset</displayName>
 <description></description>
```

**Hint**

You can find this code snippet in the <TrainingDir>\code\rest.txt file.

**POST /ruleapps**

**addRuleApp** Adds a new RuleApp in the repository. The RuleApp representation is passed in the request body in JSON or XML. If the request body contains a specific error description and the HTTP status 202 is returned.

### Build a request

/ruleapps

**Request Body**

Request Body

application/xml

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ruleApp>
 <name>myRestRuleApp</name>
 <version>1.0</version>
 <displayName>My REST RuleApp</displayName>
 <description></description>
 <rulesets>
 <ruleset>
 <name>myTestRESTRuleset</name>
 <version>1.0</version>
 <displayName>My REST ruleset</displayName>
 <description></description>
 <properties>
 <property>
 <id>{Kev}</id>
```

- \_\_\_ d. Click **Call method**.

The POST method validates that your request is well-formatted and deploys your RuleApp. Both the request and the response open, and you can view the results in XML format.

- \_\_\_ e. Scroll down to see the **Response** section.

In the response, you can see the HTTP Status value, which indicates whether the request was successful.

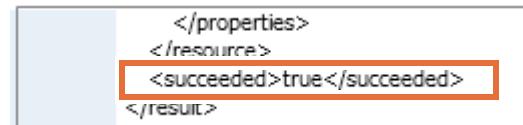
The 201 message means: Created.

### Response

HTTP Status 201

|              |                                                                                                                                                                    |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| HTTP Headers | x-powered-by: Servlet/3.0<br>Content-Type: text/xml; charset=UTF-8<br>Content-Language: en-US<br>Transfer-Encoding: chunked<br>Date: Fri, 22 May 2015 23:22:20 GMT |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|

In the response body, you can scroll to the end to also check whether the <succeeded> value is true.



- \_\_\_ f. To collapse the **addRuleApp** pane, click anywhere on the **POST** method for **addRuleApp**.
- \_\_\_ 4. View the results of deployment.
  - \_\_\_ a. Scroll up and click the **Explorer** tab of the Rule Execution Server console.  
Notice that your newly deployed RuleApp (`myRestRuleApp`) is now listed in the RuleApp View.
  - \_\_\_ b. Click your new RuleApp.  
Your new RuleApp contains your newly deployed ruleset.
- \_\_\_ 5. Delete your RuleApp.
  - \_\_\_ a. Return to the **REST API** tab in the Rule Execution Server console.
  - \_\_\_ b. Scroll down to the **DELETE** method for **deleteRuleApp** and click anywhere on the method path.
  - \_\_\_ c. In the **Request Body** fields, type the same RuleApp name and version number that you used in step Step 3.  
Notice that the request path changes as you type in your values.

**DELETE** `/ruleapps/{ruleappname}/{ruleappversion}`

**deleteRuleApp** Removes a RuleApp, identified by its name and version number, from the repository. If the repository does description and the HTTP status 202 is returned. If the removed RuleApp was still in use, the behavior is undefined.

**Build a request**

`/ruleapps/myRestRuleApp/1.0`

| URL Template Parameters                            |               |
|----------------------------------------------------|---------------|
| <input checked="" type="checkbox"/> ruleappname    | myRestRuleApp |
| <input checked="" type="checkbox"/> ruleappversion | 1.0           |

- \_\_\_ d. Click **Call method**.
- \_\_\_ e. In the **Response** pane, check the HTTP Status value to confirm that your RuleApp was successfully deleted.

The 200 message means: OK.

| Request       |                                                                                                                                                                         |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| URL           | /api/v1/ruleapps/myRestRuleApp/1.0                                                                                                                                      |
| Method        | DELETE                                                                                                                                                                  |
| Response      |                                                                                                                                                                         |
| HTTP Status   | 200                                                                                                                                                                     |
| Headers       | HTTP x-powered-by: Servlet/3.0<br>Content-Type: text/xml; charset=UTF-8<br>Content-Language: en-US<br>Transfer-Encoding: chunked<br>Date: Fri, 22 May 2015 23:25:27 GMT |
| Response Body | <?xml version="1.0" encoding="UTF-8" standalone="yes"?><result><succeeded>true</succeeded></result>                                                                     |

- \_\_\_ f. Click anywhere in the **DELETE** method path to close the pane.
- \_\_\_ 6. To view the results of this action, click the **Explorer** tab and notice that your RuleApp is no longer available in the list of RuleApps.

## End of exercise

## Exercise review and wrap-up

This exercise looked at how you can work with the Rule Execution Server console. You explored the different pages of the Rule Execution Server console. You also learned how to manage the RuleApps, the rulesets, and the managed XOMs.

# Exercise 9. Auditing ruleset execution through Decision Warehouse

## What this exercise is about

This exercise describes how to monitor ruleset execution and how to audit execution traces in Decision Warehouse.

## What you should be able to do

After completing this exercise, you should be able to:

- Enable monitoring for ruleset execution
- Retrieve decision traces through Decision Warehouse
- Optimize Decision Warehouse
- Delete trace data from Decision Warehouse

## Introduction

After the rules are deployed in the execution environment, you must be able to audit which rules were executed to determine the decision. In this exercise, you learn how to enable monitoring for a ruleset and deploy it from Rule Designer. Next, you test rule execution to generate rule execution traces that you can review in Decision Warehouse.

You also configure monitoring properties and deploy from Decision Center to see how execution traces in Decision Warehouse can link you directly to the corresponding rule artifacts in Decision Center.

This exercise continues from the same workspace that was used during Exercise 8, "Exploring the Rule Execution Server console".

The exercise includes these sections:

- Section 1, "Enabling ruleset monitoring"
- Section 2, "Retrieving decision traces in the Rule Execution Server console"
- Section 3, "Monitoring rulesets that are deployed from Decision Center"
- Section 4, "Optimizing Decision Warehouse"
- Section 5, "Deleting trace information from the database"

## Requirements

You should complete these exercises before proceeding:

- Exercise 7, "Managing deployment"
- Exercise 8, "Exploring the Rule Execution Server console"

## Section 1. Enabling ruleset monitoring

You can set properties on your ruleset to capture execution traces and determine the behavior of the ruleset during execution.

When you enable monitoring, you can retrieve information such as:

- How many tasks were executed
- How many rules were executed
- What events took place in the working memory
- Which version of the ruleset was executed

You set monitoring properties at ruleset level. You can set this ruleset property in the Rule Execution Server console by selecting the ruleset and clicking **Add Property**. By default, all the information is retrieved, except working memory events.

In this section, you enable monitoring properties on your ruleset, redeploy it, and then execute it to generate traces. After execution, you review the traces in Decision Warehouse.

### 1.1. Setting up your environment for this exercise

- 1. If the sample server is not started, start it now by double-clicking the **Start server** desktop shortcut.  
You can also go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server**.
- 2. In Rule Designer, you continue in the current workspace that you worked with in Exercise 8, "Exploring the Rule Execution Server console".

### 1.2. Enabling monitoring

In this section, you use Rule Designer to set these properties on the ruleset:

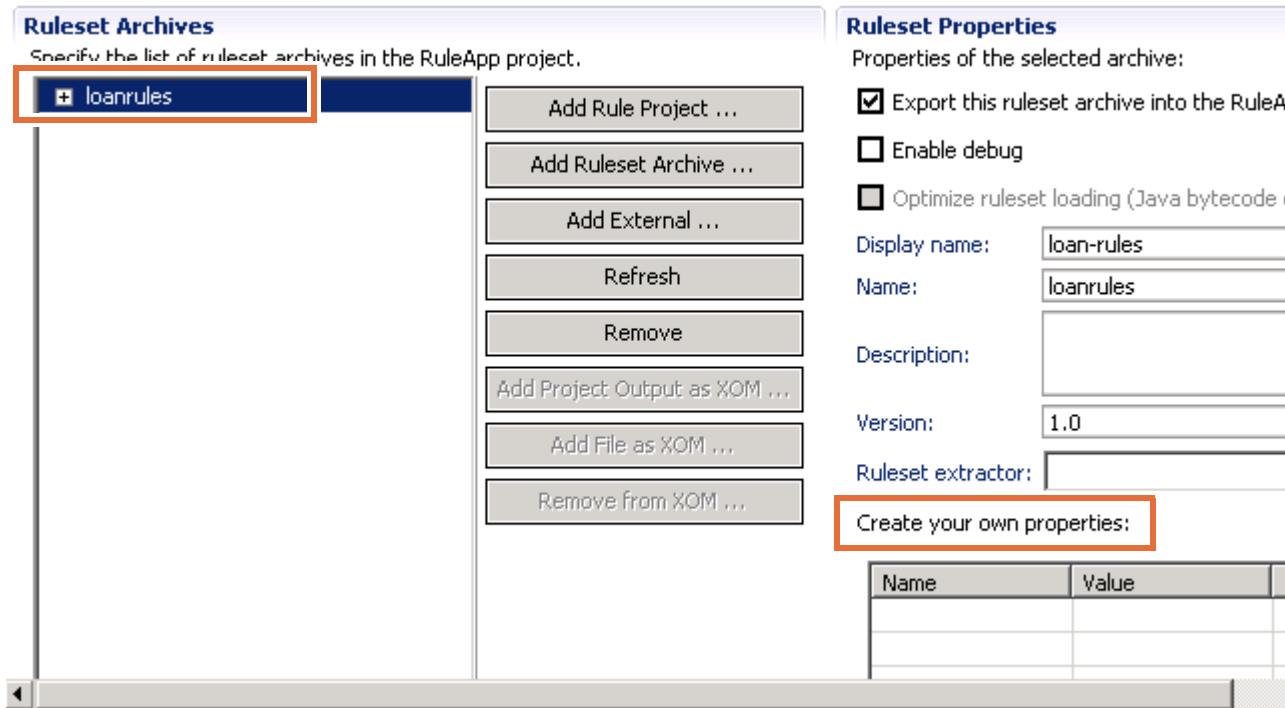
- `monitoring.enabled` with its value set to `true`
- `rulesetSEQUENTIAL.trace.enabled` with its value set to `true`

You use the `rulesetSEQUENTIAL.trace.enabled` property when the ruleset contains tasks that use the sequential or the Fastpath execution modes.

### Enabling monitoring of your ruleset

- 1. In Rule Designer, expand the **loan-RuleApp** project and double-click the `archive.xml` file to open it in the RuleApp Editor.
- 2. Click the **Ruleset Archives** tab of the RuleApp Editor and select the `loanrules` ruleset.

After you select the `loanrules` ruleset, the ruleset data opens in the Ruleset Properties section of the editor so you can add or modify properties.



- \_\_\_ 3. In the **Create your own properties** table, define the `rulesetSEQUENTIALTRACEenabled` ruleset property.
  - \_\_\_ a. In the “Create your own properties” section, click **New**.
  - \_\_\_ b. In the Edit Property window, select the `rulesetSEQUENTIALTRACEenabled` ruleset property and set its **Value** to: `true`
  - \_\_\_ c. Click **OK** to close the Edit Property window.

- \_\_\_ 4. Repeat this step to create the monitoring.enabled ruleset property and set its **Value** to: true

**Ruleset Properties**

Properties of the selected archive:

Export this ruleset archive into the RuleApp archive.

Enable debug

Optimize ruleset loading (Java bytecode generation)

|                    |            |
|--------------------|------------|
| Display name:      | loan-rules |
| Name:              | loanrules  |
| Description:       |            |
| Version:           | 1.0        |
| Ruleset extractor: |            |

Create your own properties:

| Name                | Value |
|---------------------|-------|
| ruleset.sequenti... | true  |
| monitoring.enabled  | true  |

**New**    **Edit ...**    **Remove**

- \_\_\_ 5. Save your work (Ctrl+S).



Later, you see how to set or modify the ruleset properties through the Rule Execution Server console after they are deployed.

### 1.3. Deploying the updated RuleApp from Rule Designer

In this section, you redeploy the RuleApp from Rule Designer to Rule Execution Server to make sure that the deployed RuleApp has the correct properties defined.

- \_\_\_ 1. Expand the loan-RESConfigs configuration project and double-click the IBM WebSphere AS 8.5.esc configuration file to open it.
- \_\_\_ 2. In the Rule Execution Server Console section, make sure that both the **Login** and **Password** fields of the IBM WebSphere AS 8.5.esc configuration are both set to: resAdmin
- \_\_\_ 3. If you edited the login information, save the updated configuration (Ctrl+S).
- \_\_\_ 4. Deploy the RuleApp to Rule Execution Server.
  - \_\_\_ a. In the Deployment section of the IBM WebSphere AS 8.5.esc configuration, click **Deploy**.

- \_\_\_ b. Keep the default version policy and click **Next**.



**Information**

If you get a “Java version notification” window, click **OK** to close it.

- \_\_\_ c. Select **loan-RuleApp**, clear the option to deploy the XOM, and click **Finish**.

- \_\_\_ 5. Look at the traces that are shown in the console view and make a note of the value of the major version of this `loanRuleApp`.

You must know the version of this RuleApp in a later step.



**Important**

You use this `loanRuleApp` version later in "Retrieving decision traces in the Rule Execution Server console" on page 9-7.

## 1.4. Running the client application

In this section, you run the `LoanValidation` application that you created in Exercise 7, "Managing deployment" to generate some traces. Now that there are defined monitoring properties on your ruleset, the monitoring properties capture decision trace data when the client application calls that ruleset for execution. The data is stored in Decision Warehouse.

- \_\_\_ 1. Open the client application in a web browser at the following URL:

`http://localhost:9080/LoanValidation`

Make sure that you use the correct port for your environment.

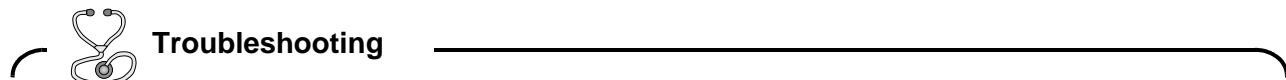
- \_\_\_ 2. Click **Start Loan Validation** and run the application with the default scenario values. Or, if the `LoanValidation` application is already running, you can click **Try again**.

Next, you work in Rule Execution Server console to view the execution traces that you generated.

## Section 2. Retrieving decision traces in the Rule Execution Server console

In this section, you work in Rule Execution Server console. You examine the RuleApp that you deployed from Rule Designer. You then explore the decision traces that are associated with the execution of the ruleset that is packaged in this RuleApp.

- 1. Open the Rule Execution Server console.
  - a. Double-click the Rule Execution Server shortcut on the desktop or open a web browser at the following web address:  
`http://localhost:9080/res`  
 Make sure that you use the correct port for your environment.
  - b. In the **Username** and **Password** fields, enter `resAdmin` and click **Sign In**.



In some cases, Rule Execution Server, Decision Center, and the Loan Validation application might fail to load when you type the URL in a browser.

If you experience this problem, closing and reopening the browser can resolve the issue. Otherwise, close your browsers again and try starting Rule Execution Server or Decision Center from the **Start** menu.

- 2. In the Rule Execution Server console, examine the RuleApp that you deployed from Rule Designer.

- a. Click the **Explorer** tab.
- b. In the RuleApps View page, click the **loanRuleApp** version that you deployed in the previous step, "Deploying the updated RuleApp from Rule Designer" on page 9-5.

You can see in the details of this RuleApp that the value of its **Display Name** field is:

`loan-RuleApp`

- c. In the Ruleset(s) section, click the **loanrules** ruleset for this RuleApp.

The Ruleset View page opens for the `loanrules` ruleset. You can see in the details of this ruleset that the value of its **Display Name** field is:

`loan-rules`

- \_\_ d. Click **Show Properties** for this ruleset.

The screenshot shows the 'Show Properties' interface in Rule Designer. At the top, there's a 'Hide Properties' link and a gear icon. Below it, it says '2 properties'. A blue header bar contains a 'Select All' checkbox and a 'Name' dropdown. Underneath, there are two entries: 'monitoring.enabled' and 'ruleset.sequential.trace.enabled'. The 'ruleset.sequential.trace.enabled' entry is highlighted with a red rectangular box. At the bottom, it says 'properties 1 - 2 of 2' and has navigation links 'prev 10 next 10'. Below this, there's a section for 'Upload properties from file' with a 'Choose file:' input field, 'Browse...' button, 'Proceed to update' button, 'Preview update' button, and an 'Override ex' checkbox.

You can see the ruleset properties that you explicitly defined in Rule Designer for this ruleset:

- monitoring.enabled
- ruleset.sequential.trace.enabled

- \_\_ 3. In the Rule Execution Server console, click the **Decision Warehouse** tab.

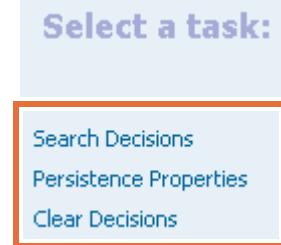
The **Decision Warehouse** tab includes these tasks:

- **Search Decisions:** To define filters on the data source to find only the events or decisions of interest.
- **Persistence Properties:** To select the data source for Decision Warehouse to query during your web session. Decision Warehouse is installed with a default data source. You can add more sources, such as historical database.

When your web session expires, the active data source reverts to the default data source.

- **Clear Decisions:** To delete existing decisions from the Decision Warehouse.

By default, the Search Decisions page opens. You can switch between these pages with the "Select a task" left pane of the **Decision Warehouse** tab.



- \_\_ 4. On the Search Decisions page, leave all the fields empty and click **Search**.  
 \_\_ 5. Scroll down the page to see the results.

All decisions that are stored in Decision Warehouse are listed because you did not specify any search filters.

Search Clear

| Decision ID                           | Date                   | Ruleset Version                    | Number of rules fired | Decision Trace                                                | Proce |
|---------------------------------------|------------------------|------------------------------------|-----------------------|---------------------------------------------------------------|-------|
| 581d742c-7bee-472d-9eb7-e82f5a498b610 | 2015-04-16<br>15:26:42 | /loanRuleApp<br>/3.0/loanrules/1.0 | 9                     | <a href="#" style="color: #0070C0;">View Decision details</a> | 219   |

1 - 1 out of 1 results

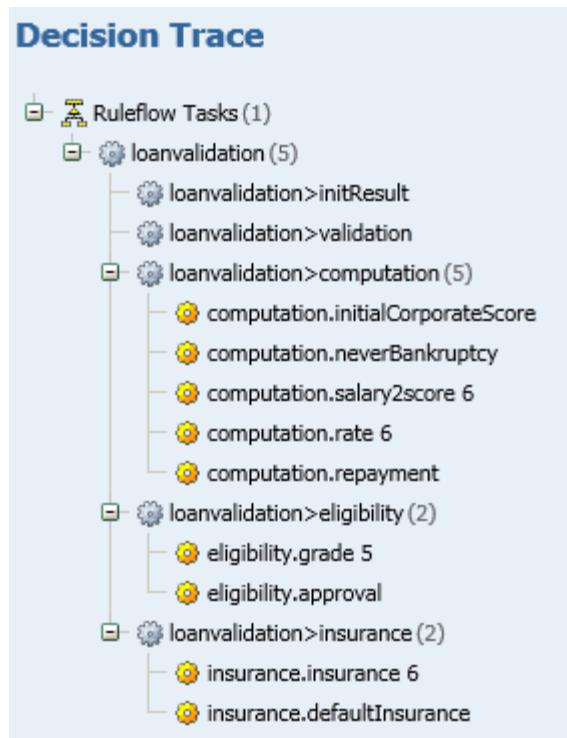
- 6. Click the **View Decision details** link in the **Decision Trace** column.  
The Decision Trace page opens, and shows the details of the execution.
- 7. Look at the fields in the Execution Details section to relate them to the ruleset execution.

### Execution Details

|                                 |                                       |
|---------------------------------|---------------------------------------|
| <b>Decision ID:</b>             | 581d742c-7bee-472d-9eb7-e82f5a498b610 |
| <b>Date:</b>                    | 2015-04-16 15:26:42                   |
| <b>Executed ruleset path:</b>   | /loanRuleApp/3.0/loanrules/1.0        |
| <b>Engine type:</b>             | cre                                   |
| <b>Processing Time (ms)</b>     | 219                                   |
| <b>Number of rules fired</b>    | 9                                     |
| <b>Number of tasks executed</b> | 6                                     |

Your RuleApp version and other details might differ from the version in this screen capture.

8. Expand the tree in the **Decision Trace** section.



### Questions

Do you understand the trace?

### Answer

Each node corresponds to a rule task or an executed rule artifact, such as a fired action rule, a row in a decision table, or a function. For a row in a decision table, the rank of the row is given. For example, `computation.rate 6` is the sixth row in the `computation.grade` decision table.



### Note

The Execution Details section in Decision Warehouse does not provide you with links that directly access the rule artifacts that were involved in the decision taken. In the next part of the exercise, you explore how to obtain these links and how they work.

## Section 3. Monitoring rulesets that are deployed from Decision Center

In this section, you work in Decision Center to enable monitoring properties on your ruleset and deploy it. After you run an application to execute the rules, you review the execution traces in Decision Warehouse. You also see how Decision Warehouse can link you directly to rule artifacts in Decision Center.

### 3.1. Logging in to the Decision Center Enterprise console

- 1. Open the Decision Center Enterprise console by double-clicking the Decision Center Enterprise console desktop shortcut or by enter the following URL in a web browser window:  
`http://localhost:9080/teamserver`
- 2. Log in as the `rtsAdmin` user.
  - **Username:** `rtsAdmin`
  - **Password:** `rtsAdmin`



**Stop**

The Decision Center repository should contain the `loan-rules` project from earlier exercises, such as Exercise 7, "Managing deployment". However, if you deleted this project from the Decision Center repository, you must publish the `loan-rules` project that is in your current workspace to Decision Center.

You must be able to access the `loan-rules` project in Decision Center before you can proceed.

For instructions on how to publish the `loan-rules` project from Rule Designer to Decision Center, see "Publishing your rule project to Decision Center" on page 7-15 in Exercise 7, "Managing deployment".

### 3.2. Configuring the RuleApp in the Decision Center Enterprise console

In this section, you create `loanRuleApp` in Decision Center with the ruleset properties that are required to have links in Decision Warehouse.

- 1. On the Enterprise console **Home** tab, make sure that **Work on a rule project** is selected and that **loan-rules** is selected from the **Project in use** menu.
- 2. Click the **Configure** tab.
- 3. Click **Manage RuleApps**.

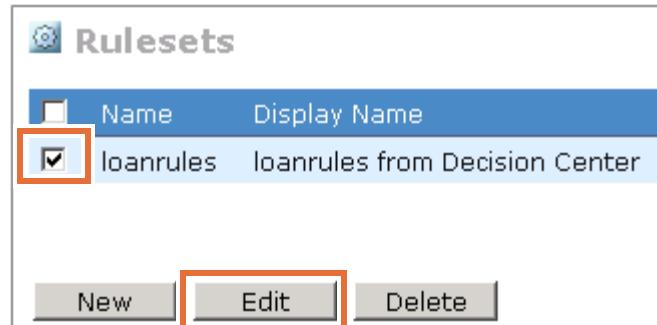
The Available RuleApps page opens. You should have an existing RuleApp listed on the Available RuleApps page.

For this exercise, you want to monitor the execution in Decision Warehouse, so you must enable tracing in the RuleApp.

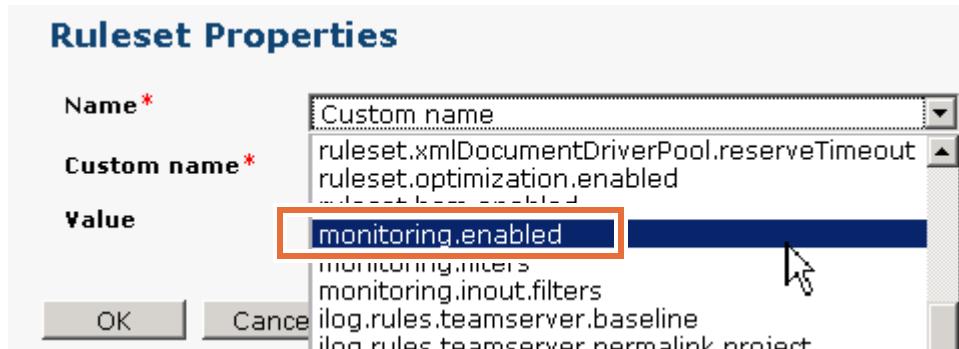
**Note**

If you do not have an existing RuleApp, re-create it by following the steps that are provided in "Creating a RuleApp in Decision Center" on page 7-16 of Exercise 7, "Managing deployment".

- 4. Open the editor for the `loanrules` ruleset in the `loanRuleApp` RuleApp.
  - a. On the Available RuleApps page, select `loanRuleApp` and click **Edit**.
  - b. In the Rulesets section of the editor, select `loanrules` and click **Edit**.

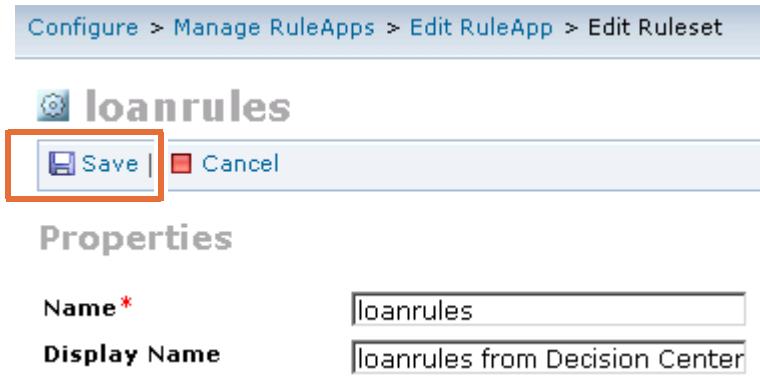


- 5. Enable the trace properties for the `loanrules` ruleset.
  - a. In the Ruleset Properties section of the editor, click **New**.
  - b. In the Ruleset Properties window, in the **Name** field, select the `monitoring.enabled` ruleset property.



- c. In the **Value** field, type `true` and click **OK**.
  - d. In the **Ruleset Properties** section, click **New** again to reopen the Ruleset Properties window, and set the `ruleset.sequential.trace.enabled` property to: `true`
- Monitoring through Decision Warehouse is now enabled for this ruleset.

- \_\_\_ 6. Click **Save** to save the ruleset.



- \_\_\_ 7. In the RuleApp page for loanRuleApp, click **Save**.

### 3.3. Deploying the RuleApp from the Decision Center Enterprise console

- \_\_\_ 1. In the list of Available RuleApps on the Manage RuleApps page, select **loanRuleApp** and click **Deploy**.
- \_\_\_ 2. In the Deployment Baseline pane, define a baseline.
  - \_\_\_ a. Make sure that the **Create a baseline for this deployment** option is selected.
  - \_\_\_ b. Define a name for this baseline, such as: **training**
  - \_\_\_ c. Click **Next**.

 **Note**

When there is more than one version of the rules, you must specify a deployment baseline so that the generated trace links point to the correct version of the rule from the deployed ruleset.

- \_\_\_ 3. In the RuleApp Target pane, make sure the **Deploy on a Rule Execution Server** option is selected and click **Next**.
- \_\_\_ 4. In the Versioning Policy pane, keep the default **Increment RuleApp major version** policy selected, and then click **Next**.
- \_\_\_ 5. In the Select Server pane, make sure that the default **Sample** server is selected and click **Deploy**.

When the deployment is successful, the Deployment Succeeded pane opens.

- \_\_\_ 6. In the Deployment Succeeded pane, make note of the value of the major version of this new **loanRuleApp** for later reference.

**Important**

You continue to use this new `loanRuleApp` version for the remainder of this exercise and for the next exercise.

- \_\_\_ 7. Click **Back** to return to the Available RuleApps page.

### 3.4. Rerunning the client application

To generate traces that use the latest RuleApp, you rerun the `LoanValidation` application that you created.

- \_\_\_ 1. If the `LoanValidation` application is closed, reopen it at the following web address:  
`http://localhost:9080/LoanValidation`
- \_\_\_ 2. If the application is still open from the previous run, click **Try again**, and rerun the application with the scenario details of your choice.

### 3.5. Reviewing the RuleApp, the decision traces, and the associated links to Decision Center

In this section, you work in the Rule Execution Server console. You examine the RuleApp that you deployed from the Decision Center console. You compare it with the RuleApp for the same rule project that you deployed from Rule Designer. You then examine the details of the taken decision in Decision Warehouse. Finally, you use the links available in the decision details to identify the rule artifacts in Decision Center that are at the origin of the decision.

- \_\_\_ 1. Log in to the Rule Execution Server console as the `odm` administrative user.
  - **URL:** `http://localhost:9080/res`
  - **Username:** `odm`
  - **Password:** `odm`

**Troubleshooting**

If you are already logged in to the Rule Execution Server console as `resAdmin`, sign out and log back in as `odm`.

If you complete this section of the exercise while logged in as `resAdmin`, you might not be able to access associated decision trace information in the Decision Center Enterprise console. The `resAdmin` user ID is not used to access the Enterprise console.

- \_\_\_ 2. In the Rule Execution Server console, view the differences in terms of ruleset properties between the RuleApp that you deployed from Rule Designer and the RuleApp that you deployed from the Decision Center console.
  - \_\_\_ a. Click the **Explorer** tab.

- \_\_\_ b. In the RuleApps View page, click the `loanRuleApp` that you deployed from Decision Center, and for which you noted the major version, in "Deploying the RuleApp from the Decision Center Enterprise console" on page 9-13.

You can see in the details of this RuleApp that the value of its **Display Name** field is:

`loanRuleApp` from Decision Center

- \_\_\_ c. Click the `loanrules` ruleset for this RuleApp.

The Ruleset View page opens for the `loanrules` ruleset. You can see in the details of this ruleset that the value of its **Display Name** field is:

`loanrules` from Decision Center

- \_\_\_ d. Click **Show Properties** for this ruleset.

The screenshot shows the 'Properties' section of the Oracle Database Ruleset View page. It displays 6 properties in a table format:

| Select All               | Name                                                 | Value                                                                                                                                                                                                                                             |
|--------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <code>ilog.rules.teamserver.baseline</code>          | current                                                                                                                                                                                                                                           |
| <input type="checkbox"/> | <code>ilog.rules.teamserver.permalink.project</code> | <a href="http://localhost:9080/teamserver/faces/home.jsp?project=loan-ru">http://localhost:9080/teamserver/faces/home.jsp?project=loan-ru</a> datasource=jdbc%2FilogDataSource                                                                    |
| <input type="checkbox"/> | <code>ilog.rules.teamserver.permalink.report</code>  | <a href="http://localhost:9080/teamserver/faces/servlet/ReportingServlet?locale=en_US&amp;datasource=jdbc%2FilogDataSource">http://localhost:9080/teamserver/faces/servlet/ReportingServlet?locale=en_US&amp;datasource=jdbc%2FilogDataSource</a> |
| <input type="checkbox"/> | <code>monitoring.enabled</code>                      | true                                                                                                                                                                                                                                              |
| <input type="checkbox"/> | <code>ruleset.bom.enabled</code>                     | true                                                                                                                                                                                                                                              |
| <input type="checkbox"/> | <code>ruleset.sequential.trace.enabled</code>        | true                                                                                                                                                                                                                                              |

properties 1 - 6 of 6

prev 10 next 10

**Upload properties from file**

Choose file:  [Browse...](#) [Proceed to update](#) [Preview update](#)  Override e

You can see the ruleset properties that are associated with this ruleset that you deployed and packaged as a RuleApp from Decision Center console.

You can see the two properties that you explicitly defined in Decision Center for this ruleset:

- `monitoring.enabled`
- `ruleset.sequential.trace.enabled`

Unlike the RuleApp that you deployed from Rule Designer, this ruleset has more ruleset properties. Decision Center added these properties when it deployed the RuleApp.

Rule Execution Server console uses the `ilog.rules.teamserver.*` ruleset properties to relate the executed rule artifacts, as listed in the decision details of the Decision Warehouse page, to the rule artifacts in Decision Center.

- \_\_\_ e. Click the link in the value field for the `ilog.rules.teamserver.permalink.report` property.



## Troubleshooting

If the Decision Center Enterprise console does not open automatically, you might need to reopen the console in a browser and sign in first. Then, click the link in the Rule Execution Server console.

The link generates a detailed HTML report in a new browser window of all the rule artifacts that are used in this ruleset.

- \_\_\_ f. Close the report window.
- \_\_\_ 3. In the Rule Execution Server console, click the **Decision Warehouse** tab and click **Search** to see the latest decision trace.



## Note

This list contains two decisions the first time that you do this exercise. You might see more decisions if you do the exercise again.

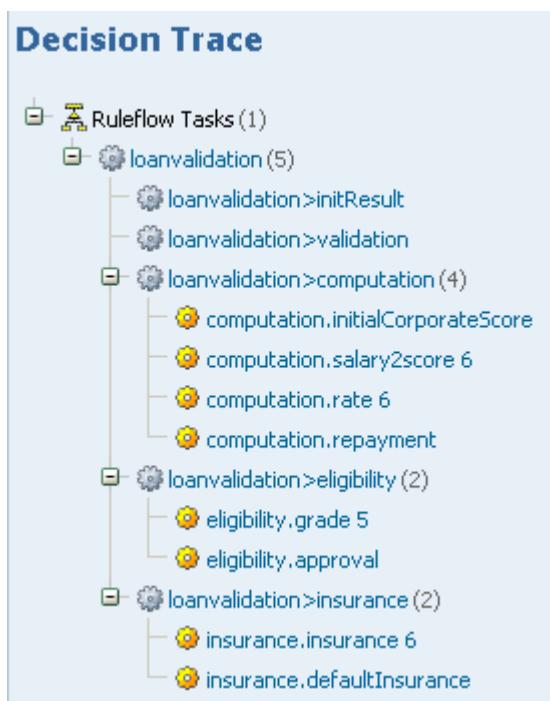
- \_\_\_ 4. Click the **View Decision details** link in the **Decision Trace** column for the decision that was taken with the `loanRuleApp` that you deployed from the Decision Center console.

You can find that decision by matching the version that you noted in "Deploying the RuleApp from the Decision Center Enterprise console" on page 9-13, with the value in the **Ruleset Version** column of the decision.

The Decision Trace page with the details of the execution opens.

- \_\_\_ 5. Look at the fields in the Execution Details section and relate them to the ruleset execution.

- \_\_\_ 6. Explore the Decision Trace information.
  - \_\_\_ a. Expand the tree in the **Decision Trace** section.



### Important

Notice that the rule artifacts in the list are links.

- \_\_\_ b. Click any of the links.

For example, expand `loanvalidation.computation` and click `computation.rate 6` to see the sixth row of the `computation.grade` decision table in Decision Center.

The Decision Center console directly opens the page where you can see the rule artifact that is associated with the link that you clicked.



### Troubleshooting

In some cases, depending on your previous work in Decision Center console and the Rule Execution Server console, you might be required to sign in to the Decision Center console again.

After you sign in, click the link from the Decision Warehouse decision trace again.

- \_\_\_ c. Close the Decision Trace window.

- \_\_\_ 7. Sign out of the Enterprise console and close the Enterprise console window.

## Section 4. Optimizing Decision Warehouse

When the trace is enabled, Decision Warehouse captures all execution trace data. You can optimize Decision Warehouse by filtering which parts of the ruleset execution trace you monitor and store, and by turning off BOM serialization.

### 4.1. Working with monitoring options

- \_\_ 1. Sign out of the Rule Execution Server console as `odm`, and sign back in as `resAdmin`.
- \_\_ 2. In the Rule Execution Server console, reopen the ruleset properties for your latest deployed RuleApp.
  - \_\_ a. Click the **Explorer** tab.
  - \_\_ b. Reopen the Ruleset View page for the `loanrules` ruleset that you used in Section 3, "Monitoring rulesets that are deployed from Decision Center".

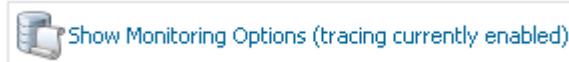


#### Important

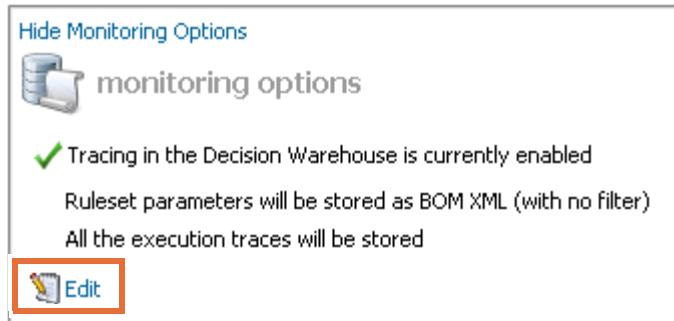
Depending on the number of times that you tried deploying, the **most recently deployed** RuleApp version should be 4.0, unless you tried deploying more times.

Make sure that you continue to work with the same **most recently deployed** RuleApp version and ruleset throughout this exercise.

- \_\_ c. Click **Show Properties** to reopen the list of ruleset properties, and note the `monitoring.enabled` ruleset property, which should be set to: `true`
- \_\_ 3. Scroll down the Ruleset View page and click **Show Monitoring Options**.



- \_\_ 4. Identify the connection between the **Enable tracing in Decision Warehouse** option and the `monitoring.enabled` ruleset property.
  - \_\_ a. Click **Edit** to open the monitoring options.



Notice that **Enable tracing in Decision Warehouse** is selected.

- \_\_ b. Clear **Enable tracing in Decision Warehouse**, and click **Save**.

- \_\_\_ c. Look in the properties section to verify that the `monitoring.enabled` ruleset property is now set to `false` and notice the icon to edit monitoring options.

|                          |                                 |       |
|--------------------------|---------------------------------|-------|
| <input type="checkbox"/> | monitoring.enabled              | false |
| <input type="checkbox"/> | monitoring.filters              |       |
| <input type="checkbox"/> | ruleset.bom.enabled             | false |
| <input type="checkbox"/> | rulesetSEQUENTIAL.trace.enabled | true  |

properties 1 - 7 of 7      prev 10 next 10

**Upload properties from file**

Choose file:

[Hide Monitoring Options](#)

**monitoring options**

Tracing in the Decision Warehouse is currently disable



### Troubleshooting

If the property values in the Rule Execution Server console are not automatically updated after saving, refresh the window by pressing F5.

- \_\_\_ 5. Enable decision tracing again.

- \_\_\_ a. In the **monitoring options** section and click the **Edit** icon beside the message: Tracing in the Decision Warehouse is currently disabled
- \_\_\_ b. Select **Enable tracing in Decision Warehouse**.
- \_\_\_ c. Click **Save**.

## 4.2. Specifying filters on the trace data

To reduce the information that is stored in an execution trace in Decision Warehouse, you:

- Apply the `monitoring.filters` property to the ruleset
- Select which filters to set so that you can refine the data that is stored

You can set the `monitoring.filters` property filter values in Rule Designer or Decision Center before you deploy a ruleset. You can also set this property on the deployed ruleset in Rule Execution Server console, which you do next.

- \_\_\_ 1. In the **monitoring options** section, click **Edit** to reopen that section.
- \_\_\_ 2. In the **Select the execution traces to store in the Decision Warehouse** list, notice which traces are selected.

The selected traces are listed as values of the `monitoring.filters` ruleset property.

|                                 |                                                                    |
|---------------------------------|--------------------------------------------------------------------|
| <code>monitoring.enabled</code> | true                                                               |
| <code>monitoring.filters</code> | INFO_EXECUTION_DATE=true,INFO_EXECUTION_DURATION=true,INFO_TOTAL_T |

- \_\_\_ 3. Select all the remaining traces in the list and click **Save**.
- \_\_\_ 4. Notice that the `monitoring.filters` property disappears from the list of properties.  
Selecting all the optional filters is equivalent to turning off the filter property.
- \_\_\_ 5. Click **Edit** to reopen the monitoring options and clear all the selected traces, and then click **Save**.
- \_\_\_ 6. Notice that the `monitoring.filters` property is again in the list of properties, but the value is empty.

|                          |                     |      |
|--------------------------|---------------------|------|
| <input type="checkbox"/> | monitoring.enabled  | true |
| <input type="checkbox"/> | monitoring.filters  |      |
| <input type="checkbox"/> | ruleset.bom.enabled | true |

- \_\_\_ 7. Turn on the default monitoring filters again.
  - \_\_\_ a. Click **Edit** to reopen the monitoring options, clear **Enable tracing in Decision Warehouse** and click **Save**.
  - \_\_\_ b. Again, click **Edit** to reopen the monitoring options, select **Enable tracing in Decision Warehouse** and click **Save**.

The default filters are now reselected.

### 4.3. Removing BOM serialization

When the `ruleset.bom.enabled` property is set to `true`, it converts the list of objects in the ruleset parameters into a memory buffer by using BOM serialization.



#### Important

For large amounts of input and output data, BOM serialization can result in poor performance.

To optimize performance, you can turn off BOM serialization.

- \_\_\_ 1. Click **Show Properties** to open the ruleset properties section, and click the **Edit** icon for the `ruleset.bom.enabled` ruleset property.
- \_\_\_ 2. Set `ruleset.bom.enabled` to `false` and click the **Save** icon.

|                          |                     |                            |  |
|--------------------------|---------------------|----------------------------|--|
| <input type="checkbox"/> | ruleset.bom.enabled | <input type="text"/> false |  |
|--------------------------|---------------------|----------------------------|--|

**Note**

You can edit only one property at a time. If you try to edit the values of more than one property, only one of the values is saved.

- \_\_\_ 3. In the **monitoring options** section, click **Edit** to reopen the options.
- \_\_\_ 4. Notice that **Native format** is the option for storing the values of ruleset parameters, and click **Cancel** to close the options editor.

When BOM serialization is turned off, the BOM objects that are passed as parameters are stored either in XML for dynamic XOMs or in a string representation for Java XOMs.

- \_\_\_ 5. Rerun the Loan Validation application to generate a new decision trace in Decision Warehouse.

If the browser is still open, click **Try again**. Otherwise, open a browser at this URL:

<http://localhost:9080/LoanValidation>

- \_\_\_ 6. In Rule Execution Server console, get the latest traces and view the format of the input and output parameters.
  - \_\_\_ a. Open the **Decision Warehouse** tab, and click **Search**.
  - \_\_\_ b. Click **View Decision details** for your latest trace.
  - \_\_\_ c. Notice the format for the input and output parameters.
  - \_\_\_ d. Click **View Decision details** for an earlier decision trace, and take a few moments to compare the parameter formats.

When you click **View Decision details** for any of the traces that are listed in Decision Warehouse, the trace details open in the same window. The most recent trace shows the parameters in Native format. Earlier traces used the default BOM serialization.

- \_\_\_ e. Close the Decision Trace windows.

## Section 5. Deleting trace information from the database

You can delete trace information from the Decision Warehouse database by specifying the ruleset paths or execution dates.

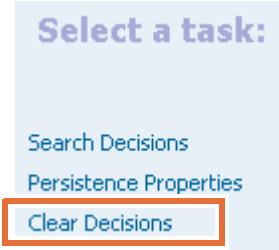


### Information

For more information, see the product documentation:

[http://www.ibm.com/support/knowledgecenter/SSQP76\\_8.7.1/com.ibm.odm.dserver.rules.res.console/topics/tsk\\_rescons\\_dw\\_trace\\_delete.html](http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.dserver.rules.res.console/topics/tsk_rescons_dw_trace_delete.html)

- \_\_\_ 1. In the Rule Execution Server console, click the **Decision Warehouse** tab.
- \_\_\_ 2. In the “Select a task” pane, click **Clear Decisions**.



- \_\_\_ 3. In the Clear Decisions page, you can either leave all fields empty to delete all traces, or you can specify the traces to delete.
  - \_\_\_ a. In the **Executed ruleset path** field, type: loanRuleApp/3.0

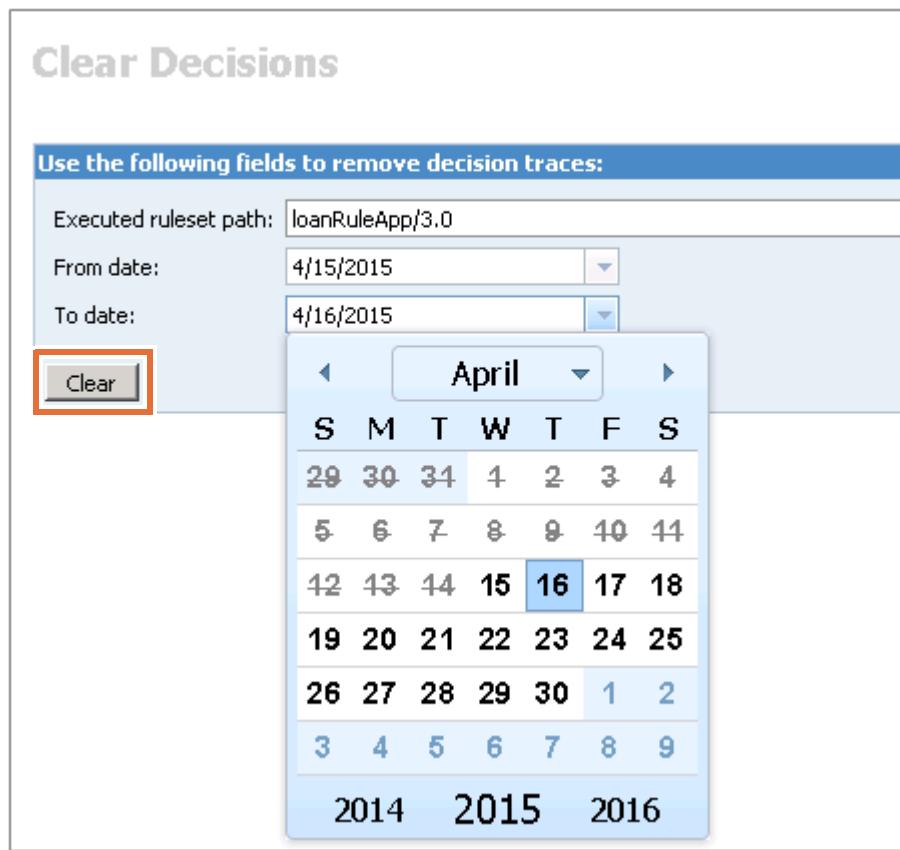


### Information

You can leave this field empty to erase all traces. You can also specify a partial or complete ruleset path to limit which traces are erased.

- \_\_\_ b. In the **From Date** field, click the calendar icon to specify a date, such as yesterday's date, or leave the field blank.

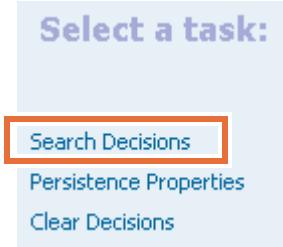
- \_\_\_ c. In the **To Date** field, click the calendar icon to specify a date, such as today's date, or leave the field blank.



- \_\_\_ 4. Clear the traces that you specified.
- Click **Clear**.  
A warning message prompts you to confirm the deletion.
  - Click **Confirm** to delete the traces.



- \_\_\_ 5. Verify that the trace that you specified is deleted.
- View the remaining traces by clicking **Search Decisions**.



- b. Click **Search**.

The trace that you cleared is no longer in the list.

6. Clear all decision traces.

- a. Click **Clear Decisions** again.

- b. Clear all of the fields so that they are empty.

- c. Click **Clear**, and then confirm the deletion.

Now all decision traces are removed.

## **End of exercise**

## Exercise review and wrap-up

The first part of the exercise looked at how you can use Decision Warehouse to audit ruleset executions.

The second part of the exercise looked at how to configure and deploy the RuleApp from Decision Center to obtain links from taken decisions visible in Decision Warehouse to rule artifacts in Decision Center.



# Exercise 10. Monitoring rule execution and performance

## What this exercise is about

This exercise describes which configuration properties and log files can help you discover problems with rule execution. You also learn how you can improve Rule Execution Server performance.

## What you should be able to do

After completing this exercise, you should be able to:

- Manage logging properties for the Execution Unit
- Monitor ruleset execution performance
- Troubleshoot configuration issues for Rule Execution Server
- Improve Rule Execution Server performance

## Introduction

In this exercise, you learn how to work with the Execution Unit (XU) configuration properties, how to enable and modify logging levels, and how to review execution traces. You work with the WebSphere Application Server administrative console, Rule Execution Server console, and the log files.

This exercise continues from the same workspace that was used during Exercise 8, "Exploring the Rule Execution Server console" and Exercise 9, "Auditing ruleset execution through Decision Warehouse".

The exercise includes these sections:

- Section 1, "Working with Execution Unit configuration properties"
- Section 2, "Monitoring execution events in the Rule Execution Server console"
- Section 3, "Troubleshooting unexpected behavior"
- Section 4, "Improving rule execution performance"
- Section 5, "Providing information to IBM Customer Support"

## Requirements

You should complete these exercises before proceeding:

- Exercise 7, "Managing deployment"
- Exercise 8, "Exploring the Rule Execution Server console"
- Exercise 9, "Auditing ruleset execution through Decision Warehouse"



**Important**

During this exercise, you work with the same `loanrules` ruleset in the most recently deployed RuleApp that you used during Exercise 9, "Auditing ruleset execution through Decision Warehouse".

## Section 1. Working with Execution Unit configuration properties

When Rule Execution Server does not work as expected, you might want to investigate the Execution Unit (XU) configuration. The application server, which is WebSphere Application Server in this course, uses the XU to connect to the rule engine.

It is sometimes difficult to establish the real cause of unexpected behavior from the XU just by reading the log files. In some cases, the problem can result from an improper XU configuration.

During this course, you manage the XU through the WebSphere Application Server console by using the **Resource Adapter** menu.

In this section, you work through these tasks:

- "Viewing the deployment descriptor on the application server"
- "Editing the deployment descriptor"
- "Editing the XU properties through the administrative console"
- "Turning on full trace mode for the Execution Unit"
- "Rerunning the client application to generate traces"

### 1.1. Viewing the deployment descriptor on the application server



#### Information

For more information about Execution Unit configuration properties, see the IBM Knowledge Center for Operational Decision Manager:

[http://www.ibm.com/support/knowledgecenter/SSQP76\\_8.7.1/com.ibm.odm.dserver.rules.res.managing/topics/con\\_res\\_xu\\_class\\_load.html](http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.dserver.rules.res.managing/topics/con_res_xu_class_load.html)

You can set configuration properties for the XU in Java EE or Java SE by modifying the deployment descriptors. For Java EE, you can also use the application server administration console.

Resource adapters use two deployment descriptors to define their operational parameters, which are similar to web applications, EJB beans, and enterprise applications in Java EE.

- The deployment descriptor (`ra.xml`) is packaged in the `META-INF` subdirectory of the RAR file. The deployment descriptor is a standard artifact as defined by the Java EE Connector Architecture (J2C) specification.
- The second deployment descriptor is specific to the Java EE application server, and it defines operational parameters that are unique to that server. There is no such file for WebSphere Application Server, which is what you use during this course.

In this exercise, you look at the XU configuration properties that are set in the deployment descriptor (the `ra.xml` file).

## Viewing the deployment descriptor through the WebSphere Application Server administrative console

- 1. Sign in to the WebSphere Application Server administrative console for the sample server with `odm` as the user name and password. (If you are already logged in with a different user name, sign out first.)
- 2. In the menu pane, click **Resources** to open the **Resources** menu, and click **Resource Adapters > Resource adapters**.



- 3. In the list of resource adapters, click **JRulesXU**.



4. In the Additional Properties section, click **View Deployment Descriptor**.

**Resource adapters**

**Resource adapters > JRulesXU**

Use this page to manage resource adapters, which provide the fundamental interface for connecting applications to an Enterprise Information System (EIS). The WebSphere(R) Relational Resource Adapter is embedded within the product to provide access to relational databases. To access another type of EIS, use this page to install a stand-alone resource adapter archive (RAR) file. You can configure multiple resource adapters for each installed RAR file.

**Configuration**

**General Properties**

- \* Scope: cells:SamplesCell:nodes:SamplesNode
- \* Name: JRulesXU
- Description: JRules XU Resource Adapter

**Additional Properties**

- J2C connection factories
- Custom properties
- View Deployment Descriptor**

5. Scroll through the configuration properties in the deployment descriptor lists to view the properties and settings in this file.

- a. Locate the property name:

```
<config-property-name>jdkLoggingEnabled</config-property-name>
```

```
<!-- Do NOT change the value of this parameter. Changing the value of this parameter could produce unpredictable result
 <config-property>
 <config-property-name> jdkLoggingEnabled </config-property-name>
 <config-property-type> java.lang.Boolean </config-property-type>
 <config-property-value> true </config-property-value>
 </config-property>
```

- b. Notice that the value of this property is set to: true



### Note

When you use WebSphere Application Server, the default value of this property is true. In the other supported application servers, the default value is false.

By logging the JDK activity during ruleset execution, the activity is captured in the `SystemErr.log` and `SystemOut.log` files in the server logs directory.

The logs directory for the sample server can be found here:

C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8710\logs\SamplesServer

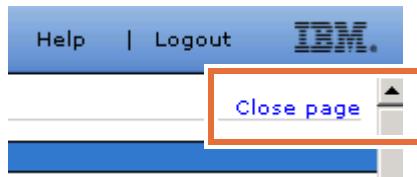
**Note**

When you use the JDK logging feature, which is the case for WebSphere Application Server, the XU traceLevel configuration property is ignored.

```
<!-- To change the trace level of the XU, replace the default value of FINE (debug messages, errors, and warnings) with one
SEVERE: only errors * WARNING: only errors and warnings * INFO: informational messages, errors, and warnings -->
<config-property>
 <config-property-name> traceLevel </config-property-name>
 <config-property-type> java.lang.String </config-property-type>
 <config-property-value> FINE </config-property-value>
</config-property>
```

The configuration properties in the `ra.xml` file are used as a template to create the J2C connection factories.

- \_\_\_ 6. Scroll to the top of the page and click **Close page** to close the descriptor file.



## 1.2. Editing the deployment descriptor

- \_\_\_ 1. Open the following directory:

`C:\Program Files\IBM\ODM871\ODM\executionserver\applicationservers\WebSphere85`

- \_\_\_ 2. Right-click the `jrules-res-xu-WAS85.rar` file and click **7-Zip > Open Archive**.
- \_\_\_ 3. Double-click the `META-INF` subdirectory to open it to access the `ra.xml` file.
- \_\_\_ 4. Edit the `ra.xml` deployment descriptor.
  - \_\_\_ a. Drag the `ra.xml` file to the desktop.
  - \_\_\_ b. Edit the copied version in a text editor such as Notepad++ to change a property value. For example, look for the `asynchronousRulesetParsing` property and set the value to `false`.
  - \_\_\_ c. Close the file.
  - \_\_\_ d. Delete the `ra.xml` file from your desktop.

**Reminder**

To apply changes from editing this file, you would drag the `ra.xml` file back to the `META-INF` subdirectory to overwrite the file in the archive and redeploy the archive.

The properties in the deployment descriptor are used as a template from which the J2C connection factories are created. If you change the properties in the `ra.xml` file after deployment, you must redeploy and delete old J2C connection factories, and then create new ones.

You can modify the existing connection factories directly through the WebSphere Application Server administrative console. Any changes that are made directly to the connection factory properties override the properties in the `ra.xml` file, but do not affect the `ra.xml` file itself.

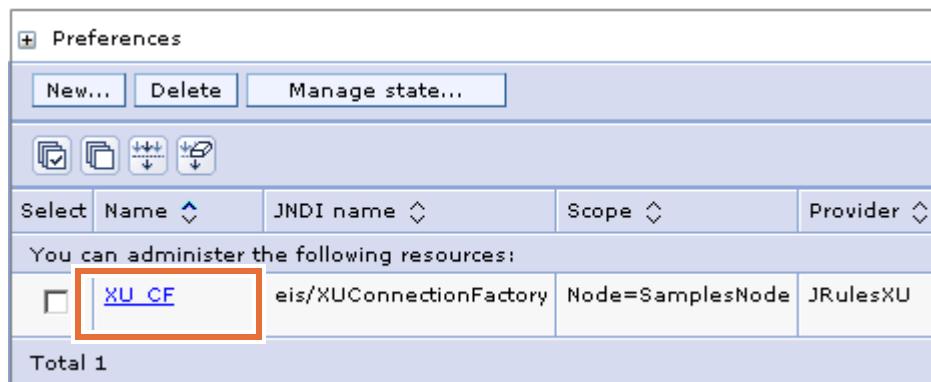
### 1.3. Editing the XU properties through the administrative console

You can modify XU configuration properties through the J2C connection factories page in the WebSphere Application Server administrative console.

- 1. Return to the WebSphere Application Server administrative console.
- 2. In the **Resources** menu of the console, click **Resource Adapters > J2C connection factories**.



- 3. In the list of resources, click **XU\_CF**.



4. On the Configuration page for this resource, click **Custom properties** under the Additional Properties section.

The screenshot shows the 'Configuration' tab selected. Under 'General Properties', there are fields for Scope ('cells:SamplesCell:nodes:SamplesNode'), Provider ('JRulesXU'), Name ('XU\_CF'), and JNDI name ('eis/XUConnectionFactory'). Under 'Additional Properties', there are links for 'Connection pool properties', 'Advanced connection factory properties', and 'Custom properties'. The 'Custom properties' link is highlighted with a red box. A 'Related Items' section at the bottom right lists 'JAAS - J2C authentication data'.

5. Scroll through the list of configuration properties.

Notice that you can click any of these properties to change their values.

6. Go back to the Configuration page for the XU by clicking the **XU\_CF** breadcrumb.



7. Click **Connection pool properties**.

The screenshot shows the 'Configuration' tab selected. Under 'General Properties', there are fields for Scope ('cells:SamplesCell:nodes:SamplesNode'), Provider ('JRulesXU'), Name ('XU\_CF'), and JNDI name ('eis/XUConnectionFactory'). Under 'Additional Properties', there are links for 'Connection pool properties', 'Advanced connection factory properties', and 'Custom properties'. The 'Connection pool properties' link is highlighted with a red box. A 'Related Items' section at the bottom right lists 'JAAS - J2C authentication data'.

8. Notice these values:

- **Maximum connections** property, which is set to 10.

You set this property according to your requirements. For example, if you have 12 rulesets that are deployed, and all of them execute frequently, setting the maximum connection pool size to 10 is too small.

- **Unused timeout** property, which is set to 30 minutes.

**General Properties**

Scope: cells:SamplesCell:nodes:SamplesNode

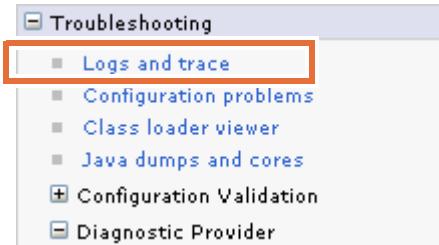
- \* Connection timeout: 180 seconds
- \* Maximum connections: 10 connections
- \* Minimum connections: 1 connections
- \* Reap time: 180 seconds
- \* Unused timeout: 1800 seconds
- \* Aged timeout: 0 seconds

**Additional Properties**

- Advanced connection pool properties
- Connection pool custom properties

## 1.4. Turning on full trace mode for the Execution Unit

- On the side pane of the administrative console, click **Troubleshooting** to open the menu and click **Logs and trace**.



- Click **SamplesServer**.

Server	Node
SamplesServer	SamplesNode

\_\_\_ 3. Click **Diagnostic Trace**.



\_\_\_ 4. Notice the two tabs on this page, **Configuration** and **Runtime**, and click **Runtime**.

The screenshot shows the 'Logging and tracing' configuration page for the 'SamplesServer'. The 'Runtime' tab is selected and highlighted with a red box. The 'General Properties' section contains a checkbox for saving runtime changes to configuration. The 'Additional Properties' section contains a link to 'Change log detail levels'.

**Logging and tracing > SamplesServer > Diagnostic trace service**

Use this page to view and modify the properties of the diagnostic trace service. Diagnostic trace provides detailed information about how the application server components run within this managed process. Changes on the Configuration panel apply when the server is restarted. Changes on the Runtime panel apply immediately.

**Configuration**    **Runtime**

**General Properties**

Save runtime changes to configuration as well

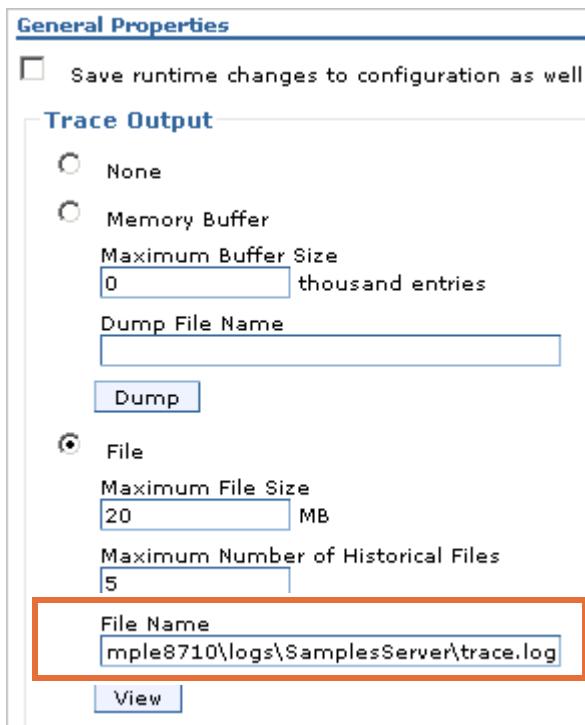
**Additional Properties**

■ [Change log detail levels](#)

Both tabs have similar options and properties, but the tab you choose determines how changes to these properties are saved.

- **Configuration** tab: Use this tab when you want to save changes that should become effective at the next restart of the server.
- **Runtime** tab: Use this tab to make updates dynamically, without restarting the server.

- \_\_\_ 5. Notice that this page contains the option to save runtime changes to the configuration and it shows the path to the trace.log log file.



- \_\_\_ 6. Click **Change log detail levels**.

The General Properties page opens.

- \_\_\_ 7. Select **Save runtime changes to configuration as well**.

- \_\_\_ 8. In the **Change log detail levels** section, notice that the logging value is set to: \*=info

- \_\_\_ 9. Expand **Components and Groups**. The components list opens.

- \_\_\_ 10. Expand the list of components to locate and expand **com.ibm.rules.res**, and then click **com.ibm.rules.res.execution > Messages and Trace Levels**.

The screenshot shows a tree view of components on the left. The path selected is **com.ibm.rules.res.execution**. A context menu is open at this node, with the option **Message and Trace Levels** highlighted with a red box. A secondary context menu, titled "Message and Trace Levels", is displayed on the right. This secondary menu has three items: **No Logging**, **Messages Only**, and **All Messages and Traces**. The **All Messages and Traces** option is also highlighted with a red box. To the right of this secondary menu, a vertical list of message and trace levels is shown, also enclosed in a red box. The levels listed are: fatal, severe, warning, audit, info, config, detail, fine, and finer.

You can choose **No logging**, **Messages Only**, or **All Messages and Traces**. You can also select various levels from the **Message and Trace Levels** list.

- \_\_\_ 11. Set the trace level for **com.ibm.rules.res.execution** to: all

- Click **All Messages and Traces**.
- Note the value change for this property, which should now be set to: =all

The screenshot shows the "General Properties" dialog with the tab "Change log detail levels" selected. There is a checkbox labeled "Disable logging and tracing of potentially sensitive data (WARNING: This might cause the log detail level setting to be modified when it is applied on the server.)". Below this is a note: "Select components and specify a log detail level. Log detail levels specified here will apply to the entire server. Expand Components and Groups and click Components to specify a log detail level for individual components, or click Groups to specify a log detail level for a predefined group of components. Click a component or group name to select a log detail level. Log detail levels are cumulative." A text input field contains the value **\*=info: com.ibm.rules.res.execution=all**, which is highlighted with a red box. At the bottom of the dialog, there is a "Components and Groups" section with a checkbox.

- Click **OK**.

- 
- \_\_\_ d. Click **Save** to save your changes to the master configuration.

Your chances take effect immediately so that your next ruleset execution generates traces in the `trace.log` file.

## 1.5. Rerunning the client application to generate traces

- \_\_\_ 1. Run the Loan Validation web application that you deployed in Exercise 7, "Managing deployment" to generate a trace.
  - \_\_\_ a. Open a web browser at the following web address:  
`http://localhost:9080/LoanValidation`  
Make sure that you use the correct port for your environment.
  - \_\_\_ b. Note the time and click **Start Loan Validation** to execute the rules with the default scenario values.
- \_\_\_ 2. Open the `trace.log` file (with Notepad++) in the default installation directory for the sample server:  
  
`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8710\logs\SamplesServer`
- \_\_\_ 3. Scroll to the end of the file to find your latest rule execution, which you can recognize by the time stamp.  
You can also search for this line: `Current trace specification`  
You should see this result:  
  
`Current trace specification = *=info:com.ibm.rules.res.execution=all`  
Notice how much information is recorded for that time stamp.
- \_\_\_ 4. Close the `trace.log` file.  
You reopen this file later.

## Section 2. Monitoring execution events in the Rule Execution Server console

As you saw in Exercise 9, "Auditing ruleset execution through Decision Warehouse", you can review decision traces in Rule Execution Server console. In this section, you learn how to monitor the execution activity and server information through Rule Execution Server console.

In this section, you work through these tasks:

- "Enabling ruleset monitoring in the Rule Execution Server console"
- "Rerunning the client application to generate traces"
- "Generating ruleset statistics"
- "Viewing logged events on Execution Units (XU)"

### 2.1. Enabling ruleset monitoring in the Rule Execution Server console

In Exercise 9, "Auditing ruleset execution through Decision Warehouse", you saw how to add monitoring properties to a ruleset in Rule Designer and Decision Center. For this step, you learn how to add monitoring properties directly from the Rule Execution Server console.



#### Important

During this exercise, use the `loanrules` ruleset in the **most recently deployed** RuleApp that you deployed in Exercise 9, "Auditing ruleset execution through Decision Warehouse". Depending on the number of times that you tried deploying, the RuleApp version should be 4.0 (or later).

Make sure that you continue to work with the same RuleApp version and ruleset throughout this exercise.

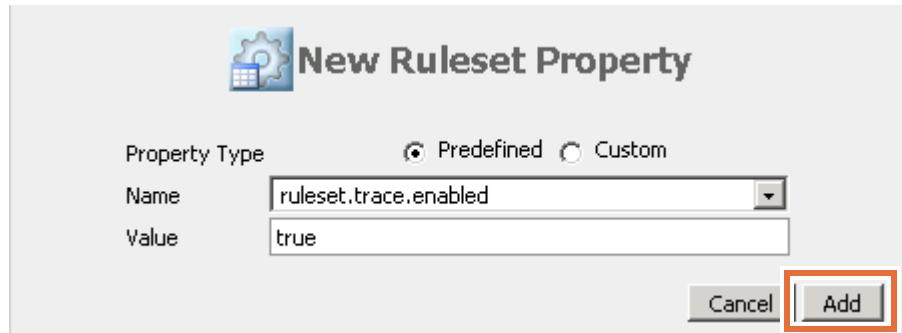
- 1. Reopen Rule Execution Server console (either from the desktop shortcut or by typing `http://localhost:9080/res` in a browser) and sign in with `resAdmin` as the user name and password.
- 2. In Rule Execution Server console, return to the Ruleset View for the `loanrules` ruleset in your most recently deployed RuleApp.
  - a. In the Navigator pane of the **Explorer** tab, expand **RuleApps** to find and expand your last deployed RuleApp (version 4.0 or later).
  - b. Click the `loanrules/1.0` ruleset.
- 3. Click **Show Properties** to see which properties are already enabled.

- \_\_\_ 4. Activate the trace mode on the ruleset by setting the value of the `ruleset.trace.enabled` ruleset property to `true`.
- \_\_\_ a. On the toolbar in the Ruleset View, click **Add Property**.

## Ruleset View



- \_\_\_ b. In the **Name** field of the New Ruleset Property pane, select `ruleset.trace.enabled`.
- \_\_\_ c. In the **Value** field, type: `true`



- \_\_\_ d. Click **Add**.

 **Reminder**

For rulesets that use the sequential algorithm, you also set the `ruleset.sequential.trace.enabled` ruleset property to `true` as you saw in Section 1, "Enabling ruleset monitoring" of Exercise 9, "Auditing ruleset execution through Decision Warehouse".

Make sure that you discuss which trace properties to use with developers.

- \_\_\_ 5. Remove the monitoring filters.

- \_\_\_ a. In the list of properties, select the `monitoring.filters` property and click **Remove** to maximize the information that is gathered.

 **Troubleshooting**

You might need to scroll all the way to the right of the Rule Execution Server console window to see the **Remove** button.

- \_\_\_ b. When prompted, click **Confirm** to confirm the removal of this property.

Notice that `monitoring.filters` is now removed from the properties list.

- \_\_\_ c. Open the **Show Monitoring Options** section, and click **Edit** to see that all the traces are now selected.

- \_\_\_ d. Click **Cancel** to close the Monitoring Properties section.

## **2.2. Rerunning the client application to generate traces**

- \_\_\_ 1. Run the Loan Validation web application to generate a trace.
  - \_\_\_ a. Open a web browser at the following web address:  
`http://localhost:9080/LoanValidation`
  - \_\_\_ b. Note the time and click **Start Loan Validation** to execute the rules with the default scenario values.
- \_\_\_ 2. Open the `trace.log` file that is in the default installation directory for the sample server:  
`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8500\logs\SamplesServer`
- \_\_\_ 3. Scroll to the end of the file to find your latest rule execution, which you can recognize by the time stamp.  
Notice that the log file now contains more information about the ruleset execution that is recorded for that time stamp.
- \_\_\_ 4. Close the `trace.log` file.

## **2.3. Generating ruleset statistics**

You can generate ruleset execution statistics from the Ruleset View in Rule Execution Server console.

Ruleset statistics provide information about ruleset execution, such as the number of times a ruleset was executed and how long the execution took. You ran the Loan Validation in the previous section, so you can view the statistics from that rule execution.



### **Information**

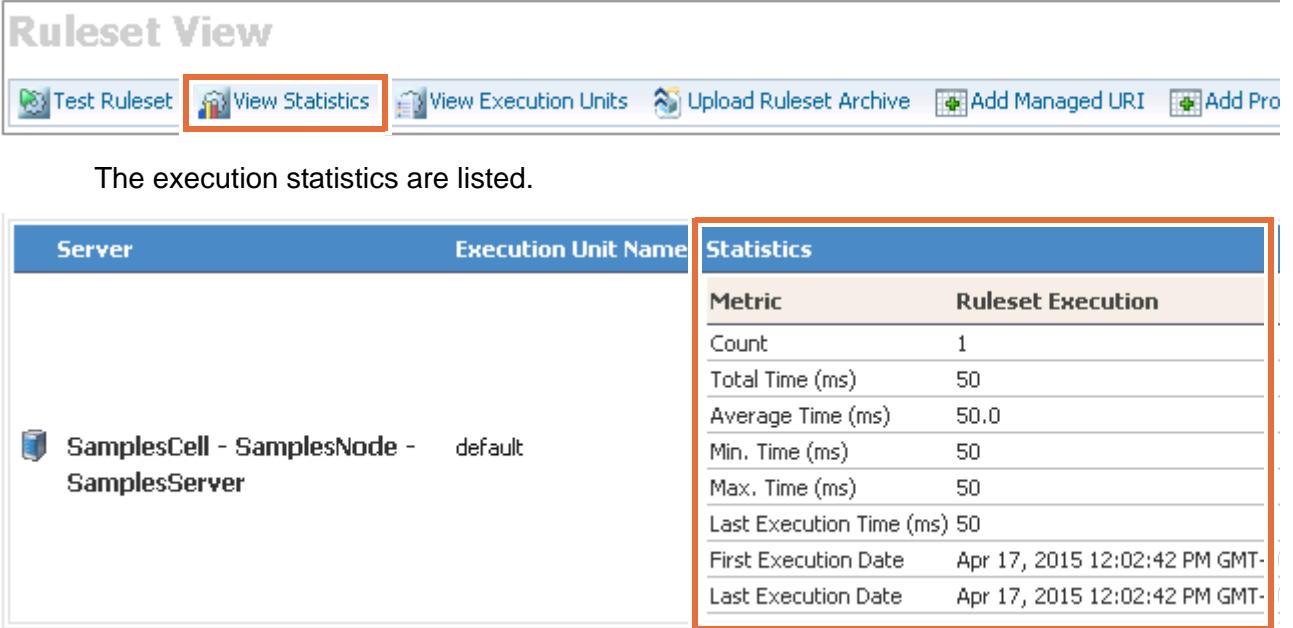
For more information about generating ruleset statistics, see the product documentation:

`http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.dserver.rules.res.console/topics/tsk_rescons_rulst_exec_stats.html`

### **Generating statistics on the previous executions of a ruleset**

- \_\_\_ 1. In Rule Execution Server console, return to the Ruleset View for your `loanrules` ruleset that you used in Section 2.1, "Enabling ruleset monitoring in the Rule Execution Server console".

2. On the toolbar, click **View Statistics**.



The execution statistics are listed.

Server	Execution Unit Name	Statistics																		
SamplesCell - SamplesNode - SamplesServer	default	<table border="1"> <thead> <tr> <th>Metric</th> <th>Ruleset Execution</th> </tr> </thead> <tbody> <tr> <td>Count</td> <td>1</td> </tr> <tr> <td>Total Time (ms)</td> <td>50</td> </tr> <tr> <td>Average Time (ms)</td> <td>50.0</td> </tr> <tr> <td>Min. Time (ms)</td> <td>50</td> </tr> <tr> <td>Max. Time (ms)</td> <td>50</td> </tr> <tr> <td>Last Execution Time (ms)</td> <td>50</td> </tr> <tr> <td>First Execution Date</td> <td>Apr 17, 2015 12:02:42 PM GMT</td> </tr> <tr> <td>Last Execution Date</td> <td>Apr 17, 2015 12:02:42 PM GMT</td> </tr> </tbody> </table>	Metric	Ruleset Execution	Count	1	Total Time (ms)	50	Average Time (ms)	50.0	Min. Time (ms)	50	Max. Time (ms)	50	Last Execution Time (ms)	50	First Execution Date	Apr 17, 2015 12:02:42 PM GMT	Last Execution Date	Apr 17, 2015 12:02:42 PM GMT
Metric	Ruleset Execution																			
Count	1																			
Total Time (ms)	50																			
Average Time (ms)	50.0																			
Min. Time (ms)	50																			
Max. Time (ms)	50																			
Last Execution Time (ms)	50																			
First Execution Date	Apr 17, 2015 12:02:42 PM GMT																			
Last Execution Date	Apr 17, 2015 12:02:42 PM GMT																			

For example, the **Count** value shows the number of times you used the `loanrules` ruleset. If you run the Loan Validation application several times, the statistics are generated.



If you do not see any statistics, rerun the client application as described in "Rerunning the client application to generate traces" on page 10-13, and then repeat these steps.

## 2.4. Viewing logged events on Execution Units (XU)

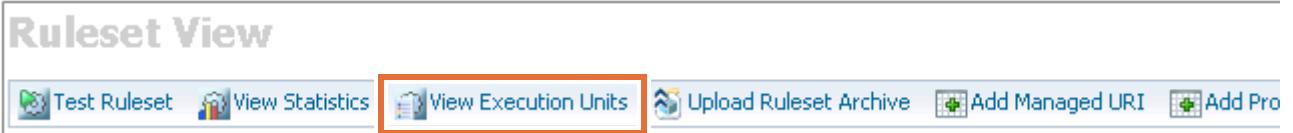
You can view the execution events that are logged for each Execution Unit (XU) in the Rule Execution Server console. You can also modify how the events information is displayed.

### Viewing logged events on Execution Units (XU)

1. Return to the Ruleset view for the `loanrules` ruleset by clicking the **Ruleset** breadcrumb.

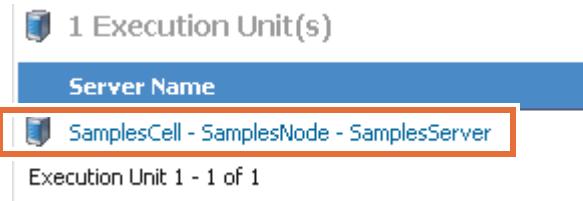


2. On the Ruleset View page, click **View Execution Units**.



The Execution Units page is displayed. The Execution Unit (XU) table provides the number of warnings and errors that are logged on each server.

- 3. Click **SamplesCell - SamplesNode - SamplesServer** in the list of deployed Execution Units.



**Note**  
You should not have any warning or error messages.

## Section 3. Troubleshooting unexpected behavior

To determine which issue is affecting performance, you can look at the logs for both the Execution Unit (XU) and the ruleset execution.

Execution unit (XU) traces can show you various performance issues that might be related to ruleset execution, including:

- Whether the ruleset is executing and the execution time
- Whether the ruleset is parsing and the parsing time
- Whether the correct version of the ruleset is used

If you discover that slow parsing or slow execution affects performance, you can look at the ruleset execution trace. The ruleset execution trace can help developers determine whether there is a problem with the ruleset logic, or whether the ruleset output is incorrect.



### Information

For more information about finding the cause of an improper Rule Execution Server configuration, see the product documentation:

[http://www.ibm.com/support/knowledgecenter/SSQP76\\_8.7.1/com.ibm.odm.distrib.troubleshooting/topics/tsk\\_res\\_config\\_causeof\\_improper.html](http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.distrib.troubleshooting/topics/tsk_res_config_causeof_improper.html)



### Note

The best way to troubleshoot ruleset errors is through Decision Validation Services. This type of troubleshooting is not an administration task.

In this section, you work through these tasks:

- "Identifying Null Pointer Exceptions"
- "Retrieving the XU memory usage"
- "Getting the XU dump"

### 3.1. Identifying Null Pointer Exceptions

For any Java application, rules developers must implement checks for null values on the objects that are used within the business rules. These checks help to avoid potential null pointer exception (NPE) issues.

Here is an example of how NPEs are logged:

```

Exception in thread "main"
An exception IlrUserRuntimeException has been thrown:
Target method: public int java.lang.String.indexOf(java.lang.String)
 at condition part of rule 'test.myRule'
 at call to 'main#myTask rule task body'
 at call to 'main flow task body'
 at call to 'execute'
Target exception stack trace:
java.lang.NullPointerException: null object when invoking public int

```

## Seeing an example of a null pointer exception

- \_\_\_ 1. In Rule Execution Server console, return to the Ruleset View page for your loanrules ruleset of your most recently deployed RuleApp.
- \_\_\_ 2. In the Ruleset View, click **Test Ruleset**.

The screenshot shows the 'Ruleset View' interface. At the top, there is a navigation bar with several buttons: 'Test Ruleset' (highlighted with a red box), 'View Statistics', 'View Execution Units', 'Upload Ruleset Archive', 'Add Managed URI', and 'Add Pro'. Below the navigation bar, there is a section titled 'Input Parameters' with a table. The table has columns: Direction, Name, Kind, XOM Type, and Value. There are two rows in the table:

Direction	Name	Kind	XOM Type	Value
<input type="checkbox"/>	<b>borrower</b>	native	training_loan.Borrower	<pre>import training_loan.*; Borrower borrower = null;</pre>
<input type="checkbox"/>	<b>loan</b>	native	training_loan.Loan	<pre>import training_loan.*; Loan loan = null;</pre>

Below the table, there is a section titled 'Execute Task' with a checkbox and a button labeled 'Execute' (highlighted with a red box). The 'Task Name' field is empty.

- \_\_\_ 4. Click **Execute**.



## Troubleshooting

For rulesets that use Java XOMs, the **Test Ruleset** tool requires that the rulesets be associated with a managed XOM. Make sure that your ruleset is associated with the `loanrules` ruleset.

The execution results show error messages, such as:

Caused by: `java.lang.NullPointerException`



### Error during test execution

[+] `ilog.rules.res.session.IlrSessionException: An error occurred while the rule session was called: com.ibm.rules.res.xu.internal.XUException: XU Client error`  
`ilog.rules.res.xu.IlrLocalizedResourceException: GBRXU0001E: The interaction ruleEngine.execute has failed`  
`javax.resource.ResourceException: com.ibm.rules.res.xu.internal.XUException: GBRXU0411E: Ruleset executio`  
`com.ibm.rules.res.xu.internal.XUException: GBRXU0411E: Ruleset execution error`  
`ilog.rules.engine.IlrUserRuntimeException: null`  
`java.lang.NullPointerException`  
`Caused by: com.ibm.rules.res.xu.internal.XUException: XU Client error`  
`Caused by: ilog.rules.res.xu.IlrLocalizedResourceException: GBRXU0001E: The interaction ruleEngine.execute h`  
`Caused by: javax.resource.ResourceException: com.ibm.rules.res.xu.internal.XUException: GBRXU0411E: Rules`  
`Caused by: com.ibm.rules.res.xu.internal.XUException: GBRXU0411E: Ruleset execution error`  
`Caused by: java.lang.NullPointerException`

The rule author or the application developer must resolve these types of errors.



## Information

For more information about the causes of NPEs, see the IBM Support technote at the following website:

<http://www.ibm.com/support/docview.wss?uid=swg21585612>

## Viewing the Execution Unit logged event

- 1. Use the **Ruleset** breadcrumb to return to the Ruleset view for the `loanrules` ruleset
- 2. Click **View Execution Units**.

The screenshot shows the 'Ruleset View' interface. At the top, there is a navigation bar with several buttons: 'Test Ruleset', 'View Statistics', 'View Execution Units' (which is highlighted with a red box), 'Upload Ruleset Archive', 'Add Managed URI', and 'Add Pro'. Below the navigation bar, there is a large, empty white area representing the main content of the page.

- \_\_\_ 3. Click **SamplesCell - SamplesNode - SamplesServer**.

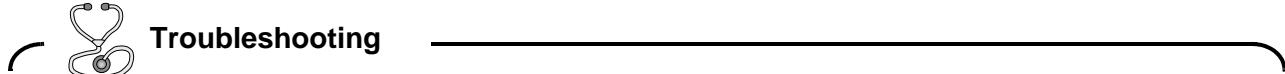
1 Execution Unit(s)

Server Name

SamplesCell - SamplesNode - SamplesServer

Execution Unit 1 - 1 of 1

The ruleset test generated an error, so you see an error message on the Execution Unit.



When you have errors or warnings on ruleset execution, make sure that you review the messages that are provided for your Execution Unit.

## Resolving the null pointer exception

- \_\_\_ 1. Define the ruleset parameters.
- \_\_\_ a. Use the **Ruleset** breadcrumb to return to the Ruleset View.
  - \_\_\_ b. Click **Test Ruleset**.
  - \_\_\_ c. Click the **Edit** icon beside the **borrower** parameter.

Parameters

Name	Kind	XOM Type	Value
<b>borrower</b>	native	training_loan.Borrower	<pre>import training_loan.*; Borrower borrower = null;</pre>

- \_\_\_ d. Replace all of the text in the **Value** field with this code:

```
import training_loan.*;
import java.util.Calendar;

Borrower borrower = new Borrower("John", "Doe", DateUtil.makeDate(1968,
Calendar.MAY, 12), "123456789");
borrower.setCreditScore(600);
borrower.setYearlyIncome(100000);
borrower.setLatestBankruptcy(DateUtil.makeDate(1990,Calendar.JANUARY,01),
7, "Unemployment");
```

**Note**

You can also copy this text from the monitor.txt code snippet file that is in the <TrainingDir>\code directory on your class image.

- \_\_\_ e. Click the **Save** icon.



- \_\_\_ f. Repeat Step d to enter this code for the loan parameter:

```
import training_loan.*;
import java.util.Calendar;

Loan loan = new Loan(DateUtil.makeDate(2005, Calendar.JUNE, 1), 60,
100000, 0.70);
```

- \_\_\_ g. Save the change.

- \_\_\_ 2. Click **Execute**.

This time, there is no error.

**Information**

You resolved the null pointer error by setting the parameters to actual values instead of leaving them set to "null."

Keep in mind that resolving a null pointer error is generally a developer task, but you should know how to recognize them.

### 3.2. Retrieving the XU memory usage

To retrieve information about the memory consumption of the Execution Unit for a ruleset, you can use the Execution Unit (XU) memory profiler. The profiler is activated through the XU configuration property: rulesetUsageMonitorEnabled

When this property is set to true, the ruleset usage information becomes available in the XU dump, which is available through the Rule Execution Server console. You learn how to access the memory dump in this exercise. See "Getting the XU dump" on page 10-25.

**Note**

If you experience memory issues with ruleset execution, it can be useful to enable the memory profiler before sending the XU dump to IBM Support.

## Enabling the Execution Unit memory profiler configuration property

- \_\_ 1. Return to the WebSphere Application Server administrative console.  
You might need to log in again with `odm` if your session timed out.
- \_\_ 2. In the menu pane, click **Resources > Resource Adapters > J2C connection factories** and click **XU\_CF**.
- \_\_ 3. In the Additional Properties section, click **Custom Properties**.
- \_\_ 4. Make sure the `rulesetUsageMonitorEnabled` property is set to: `true`  
If the `rulesetUsageMonitorEnabled` property is set to `false`, change the value to `true` and restart the sample server.
  - \_\_ a. Click **rulesetUsageMonitorEnabled**.
  - \_\_ b. If the **Value** field is set to `false`, change it to `true`, click **OK** to save the change.

The screenshot shows the 'General Properties' dialog box. At the top, there is a note about scope: 'cells:SamplesCell:nodes:SamplesNode'. Below this, there is a 'Required' checkbox which is unchecked. The 'Name' field contains 'rulesetUsageMonitorEnabled'. The 'Value' field is highlighted with a red border and contains the value 'true'. The 'Description' and 'Type' fields are also visible, with 'Type' set to 'java.lang.Boolean'. At the bottom of the dialog are four buttons: 'Apply', 'OK', 'Reset', and 'Cancel'.

- \_\_ c. Stop the sample server, and restart it.

### 3.3. Getting the XU dump

You activate the XU dump from the **Server Info** tab of Rule Execution Server console. This dump file is not specific to a ruleset.

#### Activating the XU dump

- \_\_\_ 1. Return to Rule Execution Server console, click the **Server Info** tab. (If you need to sign in again, use `resAdmin`).
- \_\_\_ 2. Set the console log level to **Debug**.

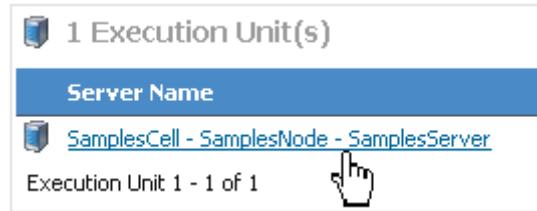
Server Name	Execution Unit Name
SamplesCell - SamplesNode - SamplesServer	default

Now that the log level is increased, you must execute the ruleset to generate activity that can be logged and reviewed.

#### Generating activity that can be logged in the dump

- \_\_\_ 1. Run the Loan Validation web application to generate a trace.
  - \_\_\_ a. Open a web browser at the following web address:  
`http://localhost:9080/LoanValidation`
  - \_\_\_ b. Note the time and click **Start Loan Validation** to execute the rules with the default scenario values.

- 2. On the Rule Execution Server console **Server Info** tab, click the name of the server from the list of deployed Execution Units.



- 3. In the **Execution Unit Dump** field, click **View** to view the trace in a new browser window.

### Server Info View

Refresh Reset Execution Unit Messages

#### SamplesCell - SamplesNode - SamplesServer

Server Name	SamplesCell - SamplesNode - SamplesServer
Execution Unit Name	default
Product Version	8.7.1.0.1
Nb of Warnings	0
Nb of Errors	0
Execution Unit Dump	<a href="#">View</a>

- 4. After you review the trace, close XU Information window.



You can also click the **Save** icon next to the **View** link to save the dump file to your computer when you must review or forward this type of information for support purposes.



The XU dump in XML format is downloaded as the `infos.zip` file and contains a single entry named: `infos.xud`. You can open the file with a text editor such as Notepad++.

## Section 4. Improving rule execution performance

In this section, you work through these tasks:

- "Understanding the ruleset cache"
- "Understanding the ruleset timeout"
- "Setting the ruleset timeout"
- "Testing performance results"

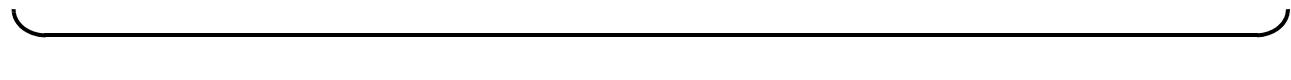
### 4.1. Understanding the ruleset cache

Recall that the XU uses a cache of ruleset instances to avoid parsing rulesets for each execution. By default, a ruleset stays in memory if at least one connection in the JCA connection pool references it. Even if the JCA connection is not active, it references rulesets until the application server deletes them.

When a ruleset is no longer referenced by a JCA connection, that ruleset is available for garbage collection. This default behavior ensures that unused rulesets are removed from the memory.



You can retrieve ruleset usage information from an XU plug-in or from a ruleset cache implementation. You can also retrieve ruleset usage information from a heap dump.



For more information about ruleset parsing and the ruleset cache, see the product documentation:

[http://www.ibm.com/support/knowledgecenter/SSQP76\\_8.7.1/com.ibm.odm.dserver.rules.res.developing/topics/tpc\\_res\\_devclient\\_parsing\\_cache.html](http://www.ibm.com/support/knowledgecenter/SSQP76_8.7.1/com.ibm.odm.dserver.rules.res.developing/topics/tpc_res_devclient_parsing_cache.html)

### 4.2. Understanding the ruleset timeout

You can specify a time for a ruleset to time out by setting the value of the ruleset property `ruleset.maxIdleTime` in the Rule Execution Server console. Timeout values are useful for ensuring that rulesets with a long parsing time are kept in memory, even when the ruleset is not referenced by a JCA connection.

This property takes the following values:

- **-1 or undefined:** The ruleset is removed from the cache, depending on how the ruleset is used by the JCA Connection Pool. The ruleset is eligible for garbage collection as soon as no service provider interface (SPI) connection references it.

Normally, you would not explicitly set this value.

- > 0: The ruleset is removed from the cache after the timeout (in seconds) is reached, and no SPI connection references it.
- 0: The ruleset is never removed from the cache, except when the ruleset is redeployed. This value is the most common setting because it ensures that the ruleset is always kept in memory. However, if you do many hot deployments and regularly execute several different versions of the ruleset, then you would not use this value.

For example, set this property to 0 if you want to execute only one version of a ruleset, such as the latest updated rulesets through hot deployments. Say that your deployment version policy is set to *replace* the ruleset version (rather than increment) so that the version number stays the same. Setting `ruleset.maxIdleTime=0` ensures that the ruleset is always cached regardless of the XU connection pool timeout settings or rule execution activity.



#### Warning

Setting the value to 0 can introduce a significant memory leak if the ruleset is never used.

### 4.3. Setting the ruleset timeout

Set the `maxIdleTime` property to define how long a ruleset is kept in memory, even if it is not used.

#### Specifying how long a ruleset stays in memory

- 1. Open the WebSphere Application Server administrative console and make sure that the XU configuration property `rulesetUsageMonitorEnabled` is set to `true`.  
You set this property in "Retrieving the XU memory usage" on page 10-23.
- 2. Return to the Ruleset View in Rule Execution Server console to set the `ruleset.maxIdleTime` property on your ruleset.
  - a. On the **Explorer** tab of Rule Execution Server, in the Navigation pane, expand **RuleApps** to find your last deployed RuleApp and click **loanrules/1.0** ruleset in your last deployed RuleApp.
  - b. In the Ruleset View, click **Add Property**.
  - c. Select **ruleset.maxIdleTime** and set the **Value** to: 1
  - d. Click **Add**.
- 3. Make sure that monitoring is enabled for the `loanrules` ruleset.
  - a. Click **Show Monitoring Options**, and click **Edit**.

- \_\_\_ b. Make sure that **Enable tracing in Decision Warehouse** is selected and that the list of selected execution traces to store in Decision Warehouse includes:
- Execution Date
  - Execution Duration
  - Total Number of Tasks Executed
  - Total Number of Tasks Not Executed
  - Total Number of Rules Fired
  - Execution Events
  - Ruleset Properties

#### 4.4. Testing performance results

In this section, you run the Loan Validation application that you deployed in Exercise 7, "Managing deployment", and view the logged activity in the `trace.log` file. You want to see how the rule execution performance differs when retrieving a ruleset from the database versus using a cached ruleset.

- \_\_\_ 1. Stop the sample server, and restart it.
- \_\_\_ 2. Run the Loan Validation web application to generate a trace.
  - \_\_\_ a. Open a web browser and go to the following web address:  
`http://localhost:9080/LoanValidation`
  - \_\_\_ b. Make a note of what time it is on your workstation, and then click **Start Loan Validation** to execute the rules with the default scenario values.
  - \_\_\_ c. Note the time so you can find the correct time stamps in the log file.
  - \_\_\_ d. Wait at least 1 minute and click **Try again** to rerun the application.
- \_\_\_ 3. Compare the execution traces in Rule Execution Server console.
  - \_\_\_ a. Go to the Rule Execution Server console and click the **Decision Warehouse** tab.
  - \_\_\_ b. Click **Search** to see the details from these two rule executions.
  - \_\_\_ c. Notice the processing times in milliseconds in the **Processing time** column.



#### Questions

The first execution took longer than the second. Why?

- \_\_\_ d. Note the time stamps in the **Date** column for these decision traces, which you can use to help you distinguish the decision traces in the log file for the next step.
- \_\_\_ 4. Review the logs for these rule executions.
  - \_\_\_ a. Open the `trace.log` file that is in this directory:  
`C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8710\logs\SamplesServer`

- \_\_\_ b. Scroll to the end of the file to find the lines that are prefaced with the time stamp of your first rule execution.
- \_\_\_ c. Look for these lines, where **X** refers to the version number of your most recently deployed RuleApp and ruleset.

retrieve /loanRuleApp/X.0/loanrules/X.0 from the repository

...

IlrRulesetProvider.getRuleset/loanRuleApp/X.0/loanrules/X.0 true

create default ruleset cache

...

These lines indicate the time that was required in the first execution to retrieve the ruleset from the repository, load it into the cache, and then parse it.



### Questions

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Search for the log of the second execution by looking for the lines that are prefaced with the time stamp for the second execution. Do you see these same actions about retrieving and parsing the RuleApp logged? Why?

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### Answer

These actions were not repeated the second time that you ran the application because the ruleset was already available in the cache, and it was already parsed.

For rulesets that take a long time to parse, you might want to experiment with the timeout values to keep such rulesets in memory even when the ruleset is not referenced by a JCA connection.

Otherwise, the ruleset is garbage-collected and must be retrieved and parsed again, which can affect performance.

---

- \_\_\_ 5. Close the trace.log file after you finish reviewing it.
- \_\_\_ 6. Close the browsers that are running the Loan Validation application and the Rule Execution Server console.

## Section 5. Providing information to IBM Customer Support

For situations where it is impossible to identify the cause of the error from the log messages, provide the following information to IBM Customer Support:

- The full XU log and other application-server-specific logs (see "Turning on full trace mode for the Execution Unit" on page 10-9)

You might be asked to forward the entire logs directory, which can be found in the installation path for your server profile.

For the sample server, the default path is:

C:\Program Files\IBM\ODM871\WAS\AppServer\profiles\ODMSample8710\logs

- The XU dump that is available from Rule Execution Server console (see "Getting the XU dump" on page 10-25)
- The JDK version
- The exact version number of the application server
- The operating system name and version
- The Decision Server version
- The JVM thread dump of all threads, if the issue seems to be a deadlock



### Questions

Based on this list of required information, write down the following details for the training environment that you are using:

JDK version	
WebSphere Application Server version number	
Operating system name and version	
Decision Server version	

Where can you access these details?

---



---

### Answer

You can determine this information in various ways.

For example, environment details are listed at the beginning of the `trace.log` file and the `SystemOut.log` file. You can find these log files in the following directory:

<InstallDir>/WAS/AppServer/profiles/profile\_name/logs/server\_name

JDK version	1.7.0
WebSphere Application Server version number	8.5.5.3
Operating system name and version	Windows Server 2008 R2, V6.1
Decision Server version	8.7.1.0

**End of exercise**

## Exercise review and wrap-up

In the first part of the exercise, you viewed and set monitoring properties through WebSphere Application Server administrative console. You also learned how to monitor execution activity through Rule Execution Server console. Finally, you reviewed logged information to identify ruleset execution performance issues.



# Exercise 11. Managing baselines and multiple releases

## What this exercise is about

This exercise teaches you how to use the rule management features that are available in Decision Center.

## What you should be able to do

After completing this exercise, you should be able to:

- Work with versions and history of rule artifacts
- Create baselines in the Decision Center Enterprise console, and use the appropriate baseline to restore previous versions of rule artifacts
- Create project branches and merge branches by using Diff and Merge tools

## Introduction

In this exercise, you learn about change management for business rule and event artifacts.

- Section 1, "Comparing and restoring versions"
- Section 2, "Working with baselines and history"
- Section 3, "Managing multiple releases and branches"
- Section 4, "Synchronizing branches with Rule Designer"

## Requirements

This exercise requires you to work in Decision Center.

## Section 1. Comparing and restoring versions



### Important

The tasks for version control are the same for both business rule projects and event projects.

As administrators, you are not required to modify rule and event artifacts, but for the purposes of this exercise, you edit the artifacts to learn about change management.

### 1.1. Before you start

- 1. If the sample server is not already started, go to **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Start server**.
- 2. Open the Decision Center Enterprise console by entering this URL in a browser:

`http://localhost:9080/teamserver`



### Information

You can also open the Decision Center Enterprise console from the **Start** menu by clicking **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Sample server > Decision Center Enterprise console**.

- 3. Sign in to the Enterprise console with the `rtsAdmin` user ID and password, which has rule administrator permissions.

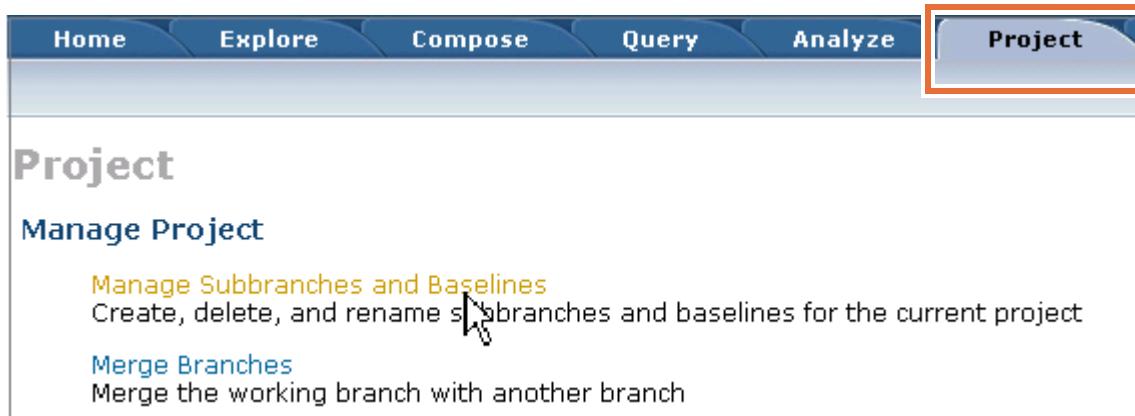
## Section 2. Working with baselines and history

In this part of the exercise, you work in the Decision Center Enterprise console with baselines and history.

After you create an initial baseline, you create an action rule and a second baseline. Then, you restore the first baseline to see that the new action rule is no longer available. Finally, you restore the second baseline to retrieve the action rule.

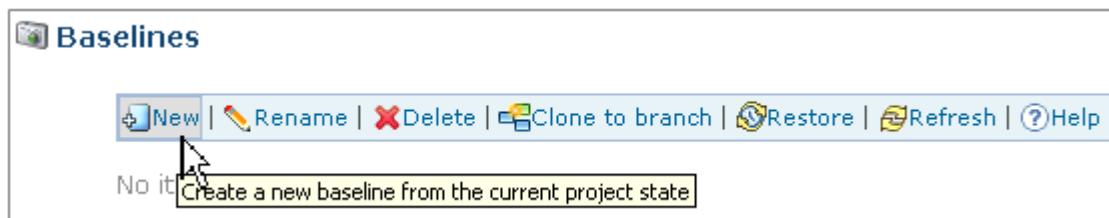
During these steps, you also see how you can follow the history of the rule in the Enterprise Console.

- 1. On the **Home** tab in the Decision Center Enterprise console, select **Work on a rule project**, and select **miniloan-rules** from the **Project in use** menu.
- 2. Click the **Project** tab, and in the Manage Project section, click **Manage Subbranches and Baselines**.



There are currently no subbranches, no baselines, and no deployment baselines.

- 3. Under Baselines, click **New** to create a baseline.



- 4. Name the new baseline `miniloan-rules-start` and click **OK**.

Notice the new baseline in the list.

### 2.1. Modifying your baseline

Create an action rule called: `Added to Baseline`

- 1. Click the **Explore** tab.

- \_\_ 2. In the **Business Rules** smart folder, click **eligibility** to see the list of rules.

The screenshot shows the 'Smart Folders' view on the left with 'Business Rules' expanded, and the 'eligibility' folder selected. The main pane displays a list of rules under 'Business Rules > eligibility'. The list includes:

- Actions **minimum credit score**
- Actions **minimum income**
- Actions **repayment and score**

The last three items are highlighted with a red box.

- \_\_ 3. On the toolbar, click **New** to add a rule.

- \_\_ 4. On the **Compose** tab, click **OK** when you see the following message:

You are about to create an Action Rule.

- \_\_ 5. Complete the Properties page.

- \_\_ a. In the **Name** field of the Properties page, enter: Added to Baseline
- \_\_ b. Make sure that the **Folder** field is set to: /eligibility
- \_\_ c. Click **Finish** to save your work.



#### Note

You can ignore the errors that indicate that the rule is incomplete.

- \_\_ 6. Return to the **Explore** tab, and verify that your new rule is listed in the **eligibility** folder.

The screenshot shows the 'Business Rules > eligibility' view. The list of rules now includes:

- Actions **Added to Baseline**
- Actions **minimum credit score**
- Actions **minimum income**
- Actions **repayment and score**

The newly added rule 'Added to Baseline' is highlighted with a red box.

## 2.2. Creating another baseline

Now that you modified the rule project by adding a rule, create another baseline to capture this change.

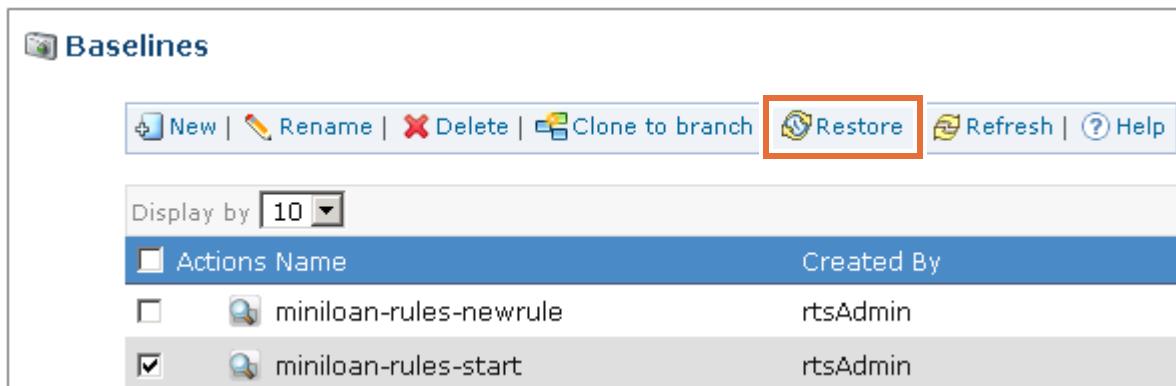
- \_\_\_ 1. Click the **Project** tab, and click **Manage Subbranches and Baselines** in the Manage Project section.
- \_\_\_ 2. Under Baselines, click **New** to create a baseline.
- \_\_\_ 3. Name the new baseline `miniloan-rules-newrule` and click **OK**.

You now have two baselines.

## 2.3. Restoring a baseline

To recover the original rule project, you can revert to the previous baseline.

- \_\_\_ 1. Restore the `miniloan-rules-start` baseline.
  - \_\_\_ a. Select the `miniloan-rules-start` baseline, and on the toolbar, click **Restore**.



- \_\_\_ b. Click **Yes** when you are prompted to confirm that you want to restore the baseline.
- When the process ends, when you see the following message:
- Baseline 'miniloan-rules-start' restored successfully.
- \_\_\_ c. Click **Back** to return to the **Project** tab.
  - \_\_\_ 2. Confirm that the `miniloan-rules-start` baseline is restored.
    - \_\_\_ a. Click the **Explore** tab.
    - \_\_\_ b. In the Smart Folders pane, click the **eligibility** smart folder.
    - \_\_\_ c. Notice that the `Added to Baseline` action rule is no longer in the folder.
  - \_\_\_ 3. On the **Home** tab, switch to the `miniloan-rules-start` baseline of the `miniloan-rules` project.
    - \_\_\_ a. Go to the **Home** tab, and make sure that **Work on a rule project** is selected and that `miniloan-rules` is selected in the **Project in use** menu.
    - \_\_\_ b. In the **Current action** menu, select **View a baseline** and select the `miniloan-rules-start` baseline.

- \_\_\_ c. Notice that the **Compose** tab is disabled because it is not possible to compose new artifacts within a baseline.

Welcome to the Decision Center Home Page

Work on a project

Project in use: miniloan-rules

Branch in use: main

Current action: View a baseline... miniloan-rules-start

You can view the rules that are included in this baseline, but you cannot add or modify rules.

- \_\_\_ 4. Click the **Explore** tab and look for the `Added to Baseline` rule in the **eligibility** folder.  
The `Added to Baseline` rule is not visible.
- \_\_\_ 5. Return to the **Home** tab, and switch to the `miniloan-rules-newrule` baseline of the `miniloan-rules` project.
- \_\_\_ 6. Click the **Explore** tab and look for the `Added to Baseline` rule in the **eligibility** folder.  
The `Added to Baseline` rule is visible because it is part of this baseline.



### Questions

Is it possible to restore the `Added to Baseline` rule, which is in the `miniloan-rules-new` baseline, to the current state of the rule project?

### Answer

One way to restore the `Added to Baseline` action rule to the current state of the rule project is to restore the `miniloan-rules-new` baseline of the `miniloan-rules` project.

You can also restore this action rule by using the `Added to Baseline` action rule history. You can see that history when you view the content of the `miniloan-rules` project for its `miniloan-rules-newrule` baseline, and then use this history to restore this action rule.

- \_\_\_ 7. Restore the `Added to Baseline` action rule by using its history.

- \_\_\_ a. On the **Explore** tab of the `miniloan-rules-newrule` baseline, select **Added to Baseline** and click **History** to see the history of this action rule.

You see the two versions of this rule:

- 1.0 is the version that you have in the miniloan-rules-newrule baseline
  - 1.1 is the version that is used in the main branch of the project and includes the following comment: Deleted from current state
- \_\_\_ b. Select 1.0 and click **Restore Version**.

	Version	Changed By	Comment
<input checked="" type="checkbox"/>	1.0	rtsAdmin	
<input type="checkbox"/>	1.1	rtsAdmin	Deleted from current state

- \_\_\_ c. When you are prompted to confirm in the Confirm Restore Version window, click **Yes**.  
After the rule is restored, its version 1.2 is created and added to the main branch of the rule project.
- \_\_\_ 8. On the **Home** tab, return to the main branch of the miniloan-rules project.
- \_\_\_ a. Make sure that **Work on a rule project** is selected, and that **miniloan-rules** is selected in the **Project in use** menu.
- \_\_\_ b. In the **Current action** field, select **Work on branch**.
- \_\_\_ c. Notice that the **Compose** tab is now enabled.
- \_\_\_ 9. Click the **Explore** tab and look for the Added to Baseline rule in the **eligibility** folder.  
The Added to Baseline rule is visible as part of the main branch.

## Section 3. Managing multiple releases and branches



### Important

The tasks for managing branches are the same for both business rule projects and event projects.



### Information

This exercise is based on a tutorial in the documentation, and takes about 20 minutes.

### 3.1. Creating a subbranch

- 1. Create a subbranch for the **miniloan-rules** project.
  - a. Go back to the **Home** tab.
  - b. Make sure that **Work on a rule project** is selected, and that **miniloan-rules** is selected in the **Project in use** menu.
  - c. In the **Current action** list, select **Create subbranch**.



### Information

You can also create a subbranch on the **Project** tab.

**Create New Branch**

Enter a name to create a subbranch of 'main' in project 'miniloan-rules'.  
New branch name:

- e. Click **OK**.
- 2. Open the **Project** tab and click **Manage Subbranches and Baselines**.

No subbranches are listed in the Subbranches section. Decision Center lists the subbranches only for the branch that you are currently working in.

- \_\_\_ 3. At the top of the page, in the **Manage subbranches and baselines of** list, select the **main** branch.

When you select the **main** branch, your new **training** subbranch is listed in the Subbranches section of the page.

Decision Center provides access to all branches in the project that you have permission to access, regardless of the branch that you are working in.

- \_\_\_ 4. In the Subbranches section, select the **training** subbranch and click **Delete**.

You receive a message that the branch cannot be deleted.

You cannot delete a branch if you are currently in it or in one of its subbranches. You must be viewing a parent branch to delete a subbranch.

- \_\_\_ 5. Return to the **Home** tab and in the **Branch in use** field, select the **main** branch.  
 \_\_\_ 6. Try to delete the **training** subbranch again.
- \_\_\_ a. Click the **Project** tab, and return to the "Manage Subbranches and Baselines" page.
  - \_\_\_ b. Select the **training** subbranch, and click **Delete**.
- This time, you can delete the subbranch because you are working in the parent branch.
- \_\_\_ c. When you are prompted to confirm deletion, click **Yes**.

## 3.2. Modifying the branch

- \_\_\_ 1. On the **Project** tab, re-create the training subbranch for the miniloan-rules project by clicking **New** on the Subbranches toolbar.

See the steps in "Creating a subbranch" on page 11-8.

- \_\_\_ 2. On the **Home** tab, select the **training** subbranch in the **Branch in use** menu.
- \_\_\_ 3. Open the **Explore** tab and modify a rule in your subbranch.
- \_\_\_ a. For example, click the **eligibility** folder, and click the **Quick Edit** icon to modify the minimum income rule.



- \_\_\_ b. In the Rule Editing pane, click **0.3** and change it to a new value, such as: **0.5**

### Definitions]

↳ yearly repayment of the loan [±] is more than the yearly income of the borrower \* ▼ [0.5] [±]

↳ ▼ Too big Debt-To-Income ratio [±] to the messages of the loan X  
reject the loan X

e]

- \_\_\_ c. Click **Save** to save your edit.
- \_\_\_ 4. Add a rule to your subbranch that is called: **Added to Branch**

You repeat the steps from "Modifying your baseline" on page 11-3 to add the new rule in the **insurance** folder.

- \_\_\_ a. On the **Explore** tab, with the **eligibility** folder open, click **New** on the toolbar to add a rule.
- \_\_\_ b. On the **Compose** tab, click **OK** when you are prompted with the following message:  
You are about to create an Action Rule.
- \_\_\_ c. Complete the Properties page.
  - In the **Name** field of the Properties page, enter: **Added to Branch**
  - Make sure that the **Folder** field is set to: **/eligibility**
  - Click **Finish** to save your work.



### Note

You can ignore the errors that indicate that the rule is incomplete.

- \_\_\_ 5. Return to the **Explore** tab by using the breadcrumb, and verify that your new rule is listed in the **eligibility** folder.

### 3.3. Merging your branches

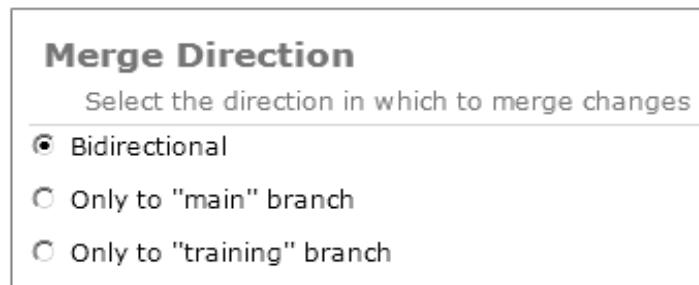
- \_\_\_ 1. Open the **Project** tab and under Manage Project, click **Merge Branches**.

The main branch is selected for merging, as that is the only other branch for this project.

Ensure that the **Lock whole branches before merge** check box is not selected.

- \_\_\_ 2. Click **Next**.

**Bidirectional** is selected as the default direction.



In the **Differences to Merge** table, notice the edits that were made on the branch.

In the **Action** column, you can choose how to merge the difference. You might need to resize the columns or scroll across to see the whole window.

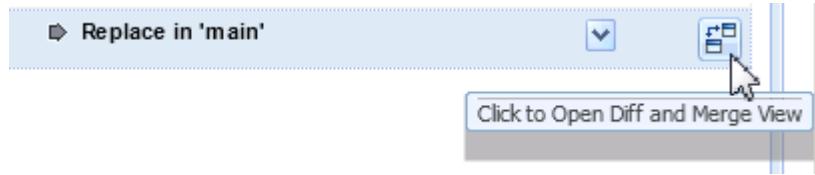
- \_\_\_ 3. In the **Action** column for one of your listed rules, click the arrow to see the list of options for merging.

Differences to Merge				
Specify the action to perform for each project element				
Name	Folder	training	main	Action
Added to Branch	eligibility	New	-	<input checked="" type="checkbox"/> Add in 'main' <input type="checkbox"/> Replace in 'main' <input type="checkbox"/> No action to perform <input type="checkbox"/> Replace in 'training'
minimum income	eligibility	Modified	Unmodified	<input checked="" type="checkbox"/> Replace in 'main' <input type="checkbox"/> Replace in 'main' <input type="checkbox"/> No action to perform <input type="checkbox"/> Replace in 'training'

Before choosing the action to take, you can analyze changes by using the Diff and Merge tool.

### 3.4. Using the Diff and Merge tool

- 1. In the row for the `minimum income` rule, next to the **Action** column, click the **Diff and Merge** icon.



The “Differences View and Merge” window opens and lists the changes for this rule between branches.

- 2. Click **Next Difference** to highlight the next available difference in the project element.

You can take one of the following actions:

- To merge the difference, click **Copy from Right to Left** or **Copy from Left to Right**, depending on which value you want to retain.

No changes are made to the project element at this stage.

- To undo the last merge, click **Revert**.

- a. For this rule, copy your change from the `training` subbranch to the `main` branch so that both rules use the following value: 0.5
- b. Undo the change by clicking **Revert**.
- c. Now change the `training` subbranch to use the original value from the `main` branch so that both rules now use the original value: 0.3



#### Hint

You must click **Next Difference** to enable the copy tools.

- 3. When you finish your changes, click **Apply** in the lower-right section of the window.

The “Differences View and Merge” window closes, and you see the **Differences to Merge** table again. The `minimum income` rule shows that changes were already merged and are ready to be applied.

- 4. Leave the default merge option for the `Added to Branch` rule and click **Apply merge**, which is in the lower-right section of the window.



After a few seconds, the Merge Branches Results page confirms which merge actions were taken and list which items were changed on which branch.

**Merge Branches Results**

The following merge operations have been successfully performed:

- Number of project elements created: 1
- Number of project elements updated: 1

	Previous Value
↳  Created with success in 'main' Branch	
↳  eligibility	
↳  Updated with success in 'training' Branch	
↳  eligibility	

- \_\_\_ 5. Sign out and close the Decision Center Enterprise console.

## Section 4. Synchronizing branches with Rule Designer

Now that you have multiple branches, you can go to Rule Designer and synchronize with a specific branch.

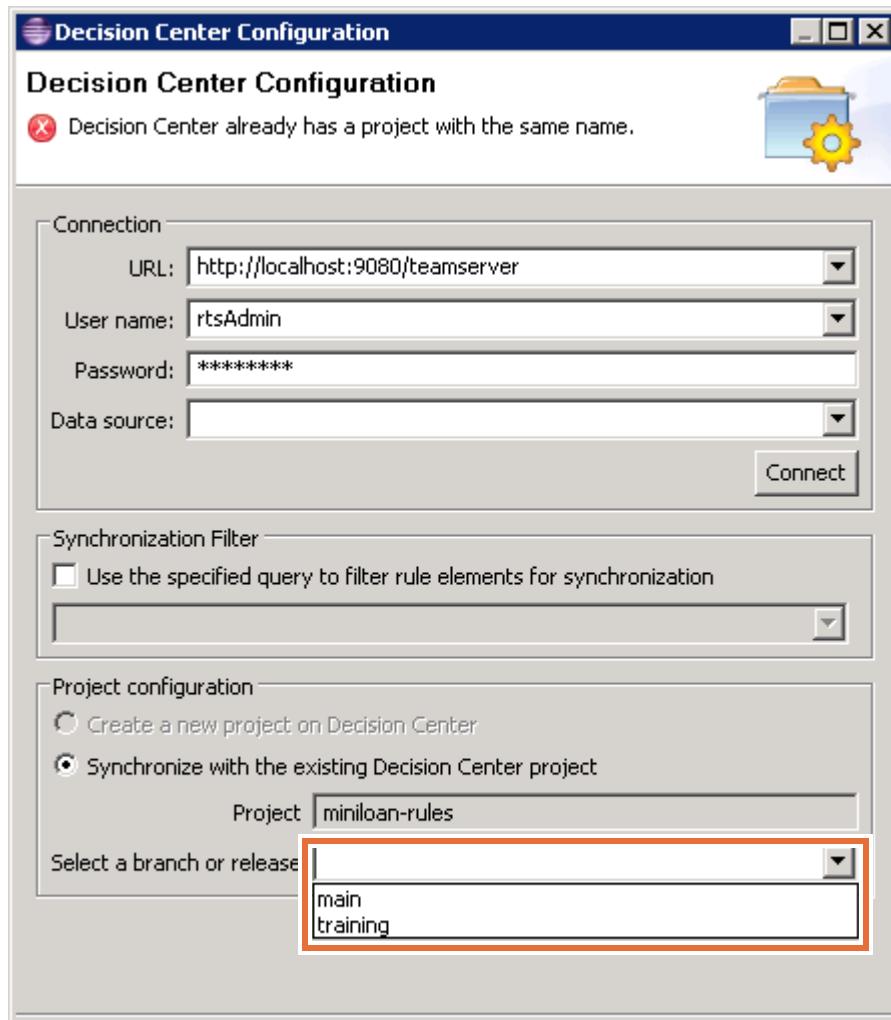
- \_\_\_ 1. If Rule Designer is already open, you can continue working in that workspace.  
Otherwise, reopen Rule Designer to a new workspace.
  - \_\_\_ a. Click **Start > All Programs > IBM > Operational Decision Manager V8.7.1 > Rule Designer**.
  - \_\_\_ b. When prompted for a workspace path in Rule Designer, type:  
`C:\labfiles\workspaces\sync-branch`
  - \_\_\_ c. Import the **Ex11: Managing baselines and multiple releases > 01-start** project by using the Samples Console.
  - \_\_\_ d. Wait for the workspace to finish building, then close the **Help** tab.
- \_\_\_ 2. In your workspace, right-click the **miniloan-rules** project and click **Decision Center > Connect**.
- \_\_\_ 3. In Decision Center configuration, enter the following connection information.
  - \_\_\_ a. In the **URL** field, enter: `http://localhost:9080/teamserver`
  - \_\_\_ b. In the **User name** and **Password** fields, enter: `rtsAdmin`
  - \_\_\_ c. Click **Connect**.

After the connection is successfully established, the “Project configuration” section is enabled, and you see a warning message that says:

Decision Center already has a project with the same name.

The **Synchronize with the existing Decision Center project** option should be selected.

Now, because this project has multiple branches, the **Select a branch or release** menu is enabled. You can use this menu to choose which branch to synchronize with.



- \_\_\_ 4. In the “Project configuration” section, click the drop-down list arrow to see the list of branches.
- \_\_\_ 5. Click **Cancel**. The purpose of this part of the exercise is to show you how you can synchronize with different branches.
- \_\_\_ 6. Close Rule Designer.



#### Important

If you are required to manage synchronization for business users, make sure that you communicate clearly with the business users about which branches and which artifacts must be synchronized to avoid surprises.

### End of exercise

## Exercise review and wrap-up

The first part of the exercise looked at rule management through version control. Next, you worked with branching and multiple release management. Finally, you saw how the existence of branches on a project can affect synchronization choices when synchronizing between Decision Center and Rule Designer.

# Exercise 12. Installing Decision Server Insights

## What this exercise is about

In this exercise, you learn how to install Decision Server Insights on multiple hosts. When you install for production, you must first:

- Install IBM Installation Manager on every machine where Insight Server should run
- Install Decision Server Insights through Installation Manager on every machine where Insight Server should run

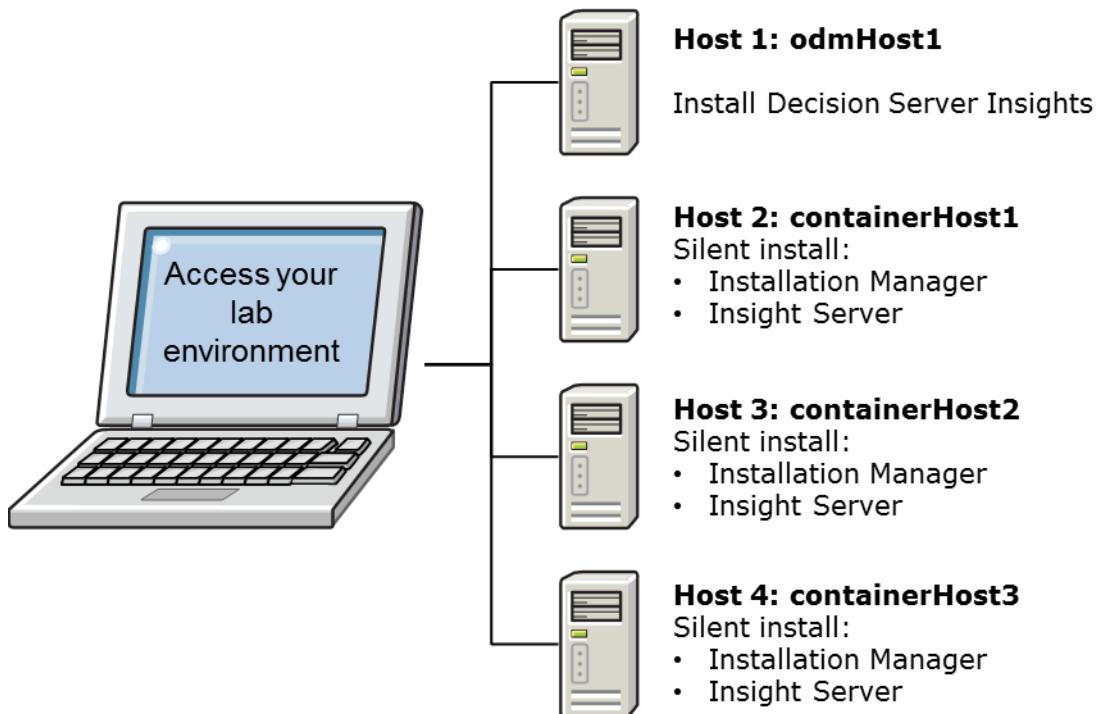
## What you should be able to do

After completing this exercise, you should be able to:

- Prepare the Decision Server Insights silent installation template
- Install Insight Server on multiple hosts

## Introduction

In this exercise, you install Decision Server Insights on each of the hosts that are in your environment.





### Warning

The default host names are: **odmHost1**, **containerHost1**, **containerHost2**, and **containerHost3**. If you are in a classroom setting with multiple sets of hosts for students, your hosts might be renamed to other unique host names.

Make sure that you know the host names of the virtual images that you are using and that you use the **actual** host name or the IP address during the exercises.

This exercise includes these sections:

- Section 1, "Installing Decision Server Insights V8.7.1"
- Section 2, "Preparing the Decision Server Insights template for silent installation on multiple hosts"
- Section 3, "Copying the installation files to the remote hosts"
- Section 4, "Running the silent installation on the remote hosts"

## Requirements

This exercise requires that:

- All other servers must be stopped (make sure that the sample server is not running)
- ODM Advanced V8.7.1 must be installed on the main host (odmHost1)
- Decision Server Insights installation files must be on the main host (odmHost1)

For this exercise, you start on odmHost1. You also work with the other three workstations: containerHost1, containerHost2, and containerHost3.



### Warning

The exercise instructions assume that your machines use the default host names. However, if your hosts use other unique names, make sure that you use the **actual** host name during the exercises.

## Section 1. Installing Decision Server Insights V8.7.1

You install Decision Server Insights by using IBM Installation Manager. To install Decision Server Insights, you must first add the Decision Server Insights installation file as a repository in IBM Installation Manager.

### 1.1. Stopping other servers

If any other servers were running during previous exercises, make sure that they are stopped.



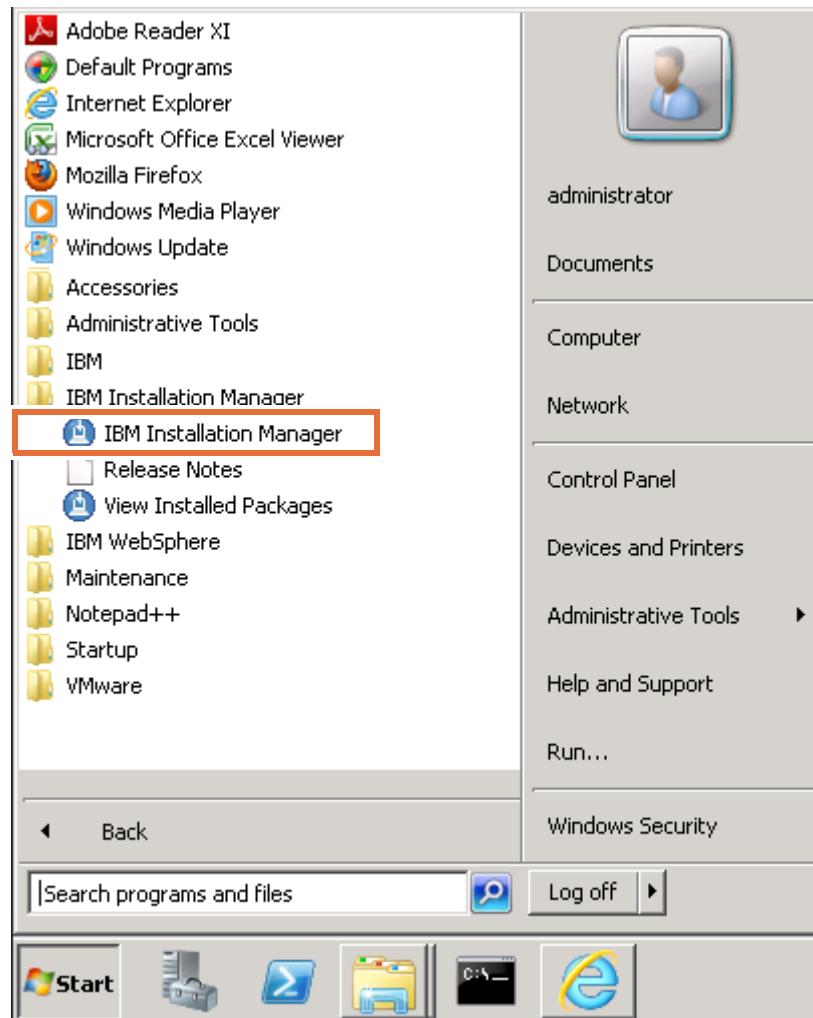
To avoid port conflicts during the next exercises, the other application servers that you worked with during the previous exercises must not be running.

- 1. To stop the sample server, double-click the **Stop server** desktop icon or click **Start > All Programs > IBM > IBM Operational Decision Manager V8.7.1 > Sample server > Stop server**.
- 2. To stop the AppSrv01 server, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > AppSrv01 > Stop server**.
- 3. To stop the RuleSrv01 server, click **Start > All Programs > IBM WebSphere > IBM WebSphere Application Server Network Deployment V8.5.5 > Profiles > RuleSrv01 > Stop server**.

It takes a few moments to stop the servers.

## 1.2. Adding the Decision Server Insights installation files as a repository

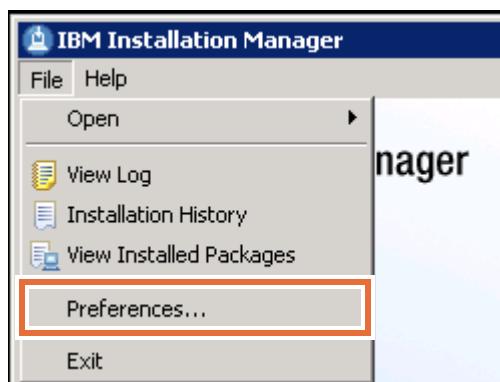
- 1. Start IBM Installation Manager.
  - a. Go to **Start > All Programs > IBM Installation Manager** and click **IBM Installation Manager**.



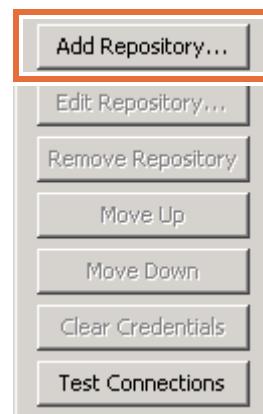
IBM Installation Manager opens.

2. Add the Decision Server Insights installer files as an IBM Installation Manager repository.

a. In the IBM Installation Manager main window, click **File > Preferences**.



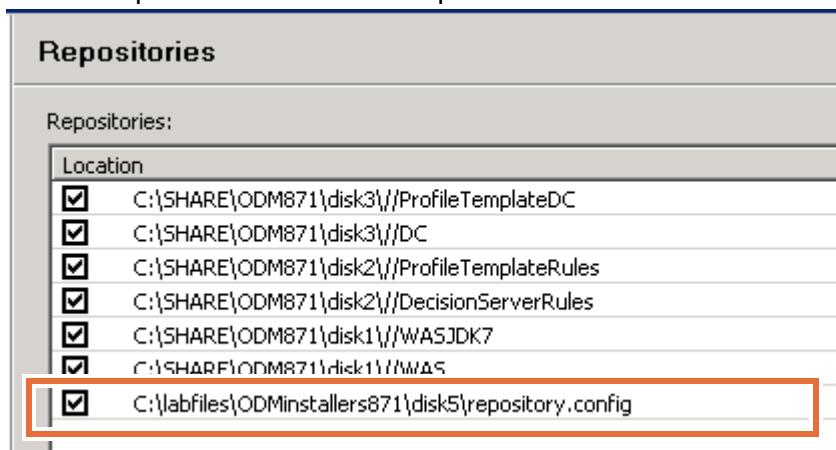
b. Click **Add Repository**.



c. In the Add Repository window, click **Browse**, and go to the C:\labfiles\ODMInstallers871\disk5 directory.

d. In the **disk5** folder, select the `repository.config` file, click **Open**, and then click **OK**.

The installation path is added to the Repositories list.



e. Click **OK** to exit and close the Preferences window and return to the main Installation Manager window.



## Troubleshooting

If you get a warning about repositories that are not connected, click **OK** to ignore it.

### 1.3. Installing Decision Server Insights

- 1. In the IBM Installation Manager window, click **Install**.



- 2. From the Installation Packages list, select **Decision Server Insights Version 8.7.1.0**, and click **Next**.

The screenshot shows the 'Install Packages' window. At the top, it says 'Select packages to install:'. Below is a table titled 'Installation Packages' with a single row. The row shows 'Decision Server Insights' with a checked checkbox and 'Version 8.7.1.0' with another checked checkbox. The status column indicates 'Will be installed'.

Installation Packages	Status
<input checked="" type="checkbox"/> Decision Server Insights <input checked="" type="checkbox"/> Version 8.7.1.0	Will be installed

- 3. In the Install Packages Licenses window, select **I accept the terms in the license agreement**, and click **Next**.
- 4. In the Install Packages Location window, set the installation path.
  - a. Select **Create a new package group**.

- \_\_\_ b. Change the directory path in the **Installation Directory** field to the following path:

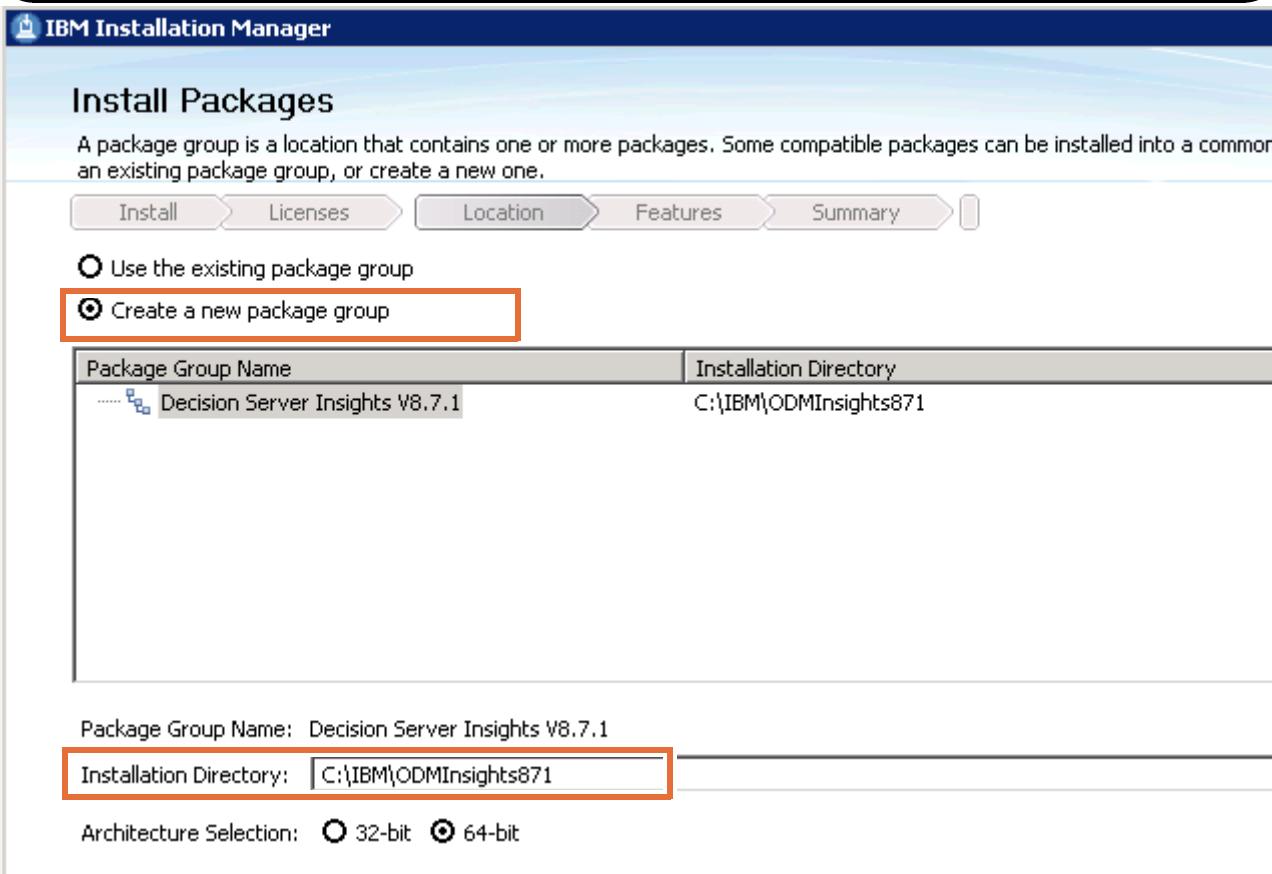
C:\IBM\ODMInsights871



### Warning

To avoid potential conflicts with user permissions in Operational Decision Manager and Decision Server Insights, you must install Decision Server Insights in a separate directory from Operational Decision Manager.

By default, Operational Decision Manager is installed in the C:\Program Files\IBM\ODM871 directory. Make sure that you install Decision Server Insights outside of Program Files and Program Files (x86) to avoid user privilege conflicts.



- \_\_\_ 5. Click **Next**.
- \_\_\_ 6. In the Install Packages “Select the translations to install” window, keep **English** as the selected language, and click **Next**.

- \_\_\_ 7. In the Install Packages “Select the features to install” window, keep the default feature selections, and click **Next**:



- \_\_\_ 8. In the Install Packages “Fill in the configurations for the packages” window, select **I intend to create a Container server (as well as possibly other server types) for use in non-production**, and click **Next**.

What is the purpose of your license?

For product inventory purposes, you must declare how you intend to use this installation of Decision Server Insights. Only servers of type "Container" will be counted in the inventory, and you can select from 3 license types:

- Container server in production, if you plan to use the product in your production environment,
- Container server in non-production if you plan to use the product for internal non-production activities, including but not limited to testing, performance tuning, fault diagnosis, internal benchmarking, staging, quality assurance activity.
- No Container server. All other servers (Catalog, Inbound, Outbound, Development) are authorized.

- I intend to create a Container server (as well as possibly other server types) for use in production  
 I intend to create a Container server (as well as possibly other server types) for use in non-production  
 I don't intend to create a Container server

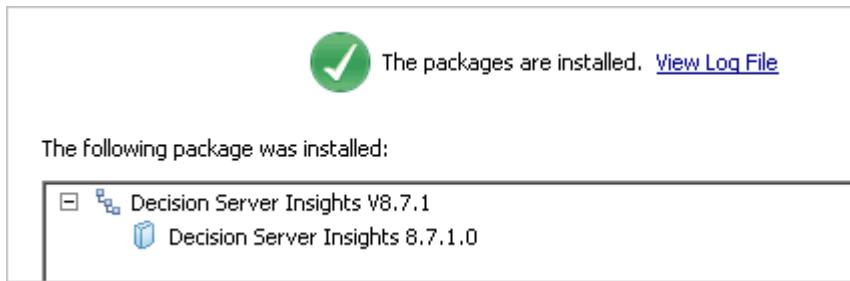
- \_\_\_ 9. In the Install Packages “Review the summary information” window, click **Install**.



### Note

The Decision Server Insights installation takes about 10 minutes to complete.

When the installation is finished, you see a confirmation message that Decision Server Insights is installed.



- \_\_\_ 10. Click **Finish** to exit the Installation Summary window and close Installation Manager.

## Section 2. Preparing the Decision Server Insights template for silent installation on multiple hosts

You can run a silent installation of Decision Server Insights with IBM Installation Manager. Before you run the silent installation, you must prepare the installation template that is provided for Decision Server Insights.

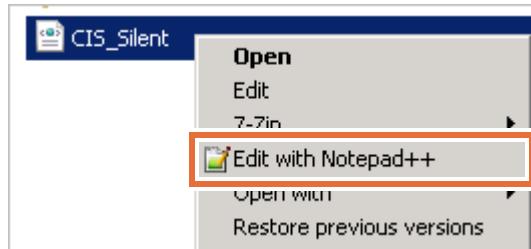


### Information

For this exercise, you installed Decision Server Insights on Host 1: odmHost1. After you install Decision Server Insights on a host, the template for silent installation is provided in the <InstallDir>\doc\silent directory.

### To prepare the CIS\_Silent.xml template

- \_\_\_ 1. Open the C:\IBM\ODMInsights871\doc\silent directory.
- \_\_\_ 2. Copy the CIS\_Silent.xml file to the C:\labfiles\ODMinstallers871 directory.
- \_\_\_ 3. Right-click the CIS\_Silent.xml file, and click **Edit with Notepad++** to open the installation template.



### Note

If you get update messages for Notepad++, you can ignore them.

In the template, you define the following settings:

Template placeholders	Description
<repository location='!CIS_REPOSITORY!'>	Directory location where the installation files are stored.
<profile id='!CIS_PROFILE_ID!'>	Name to use for the installation package group.
<installlocation='!CIS_HOME!'>	Directory location to use as the installation path.
<data key='user.prod.cis' value='!CIS_PRODUCTION!'>	Boolean value to identify whether the installation is for production.

Template placeholders	Description
<features='CIS_FEATURES!'>	Comma-separated list of features to install.

The placeholders are delimited with the exclamation (!) character.

You replace them with the actual value.

Here you see the placeholders that are highlighted in the template.

```
#####
All repositories are listed here.
A repository can be either a local location or a live repository.
#####
-->
<server>
 <repository location='!CIS_REPOSITORY!' />
</server>

]<!--

#####
This profile node defines where Operational Decision Manager will be installed
#####

<profile id='!CIS PROFILE ID!' installLocation='!CIS HOME!'>
 <data key='eclipseLocation' value='!CIS HOME!' />
 <data key='cis.selector.nl' value='fr es it en de nl pt_BR ru ja ko zh zh_TW' />
 <data key='user.prod.cis' value='!CIS PRODUCTION!' />
</profile>

]<!--

#####
This installation node directs the IM installer to install IM-based offerings.
#####

-->
<install modify='false'>
 <offering id='com.ibm.websphere.cis.ia.v87' profile='!CIS PROFILE ID!' features='!CIS FEATURES!' installFixes='none' />
</install></pre>

```

- \_\_\_ 4. In the <server> section of the template, set the CIS\_REPOSITORY value to the location of the **disk5** (Decision Server Insights) installation folder, as you see here.

```
<server>
 <repository location='C:\labfiles\ODMInstallers871\disk5' />
</server>
```

- \_\_\_ 5. Set the remaining placeholder properties to the following values.

Placeholder	Value
CIS_PROFILE_ID	Decision Server Insights V8.7.1
CIS_HOME	C:\IBM\ODMInsights871
CIS_PRODUCTION	true
CIS_FEATURES	base, com.ibm.cis.runtime.feature

- \_\_\_ 6. Save the file as **CIS\_Silent.xml** in the **C:\labfiles\ODMInstallers871** directory.



**Note**

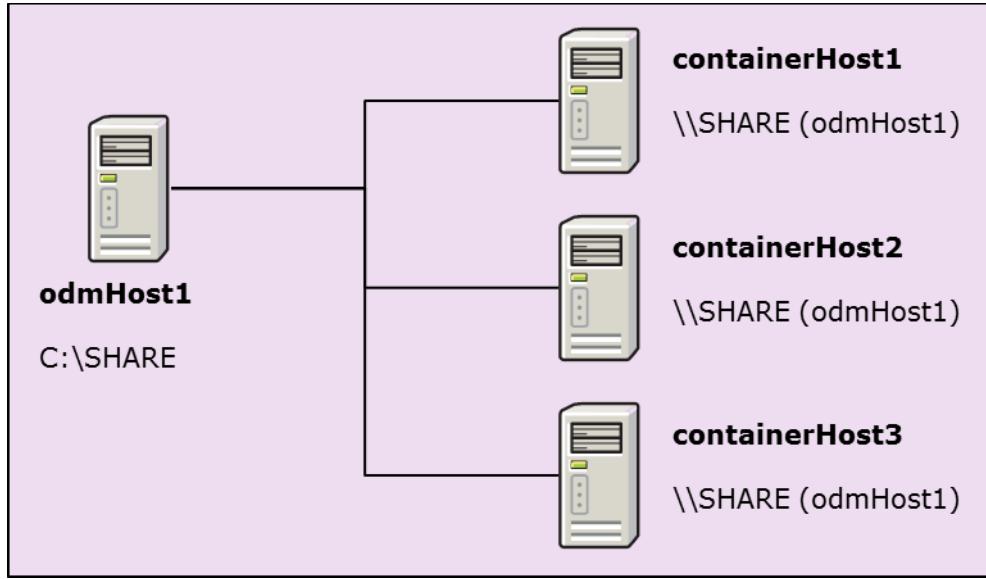
Make sure that you set all the placeholders. You can use the CIS\_Silent.xml file in the C:\labfiles\code directory to compare your settings for this exercise.

## Section 3. Copying the installation files to the remote hosts

Before running the silent installation on the remote hosts, you must copy the installation files for Installation Manager and Decision Server Insights to each remote host. You also copy the Decision Server Insights installation template to each host.

To transfer files from one virtual machine to another, you use the shared directory: C:\SHARE

The C:\SHARE folder is on your main host (odmHost1). The other machines have a drive that is mapped to the SHARE folder.



### Warning

The default host names are: **odmHost1**, **containerHost1**, **containerHost2**, and **containerHost3**. See "Environment" on page -xi.

Make sure that you know and use the host names and IP addresses that are assigned to your virtual images during the exercises.

You can use the Appendix B, "Host names and IP addresses" as a reference for the host names and IP addresses that are assigned to your host.

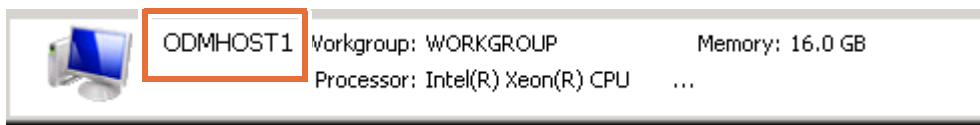
### 3.1. Verifying your host name

To verify the host name:

- 1. On the desktop, double-click the **Computer** icon and click **Properties**.



- 2. In the **Computer name, domain, and workgroup settings** section, note the value for **Computer name**.



**Stop**

The default host name for the “main” host is **odmHost1**. Your “main” host might have a different name. If the computer name is not odmHost1, take note of the actual computer name and use that name whenever the exercise instructions require the host name.



**Troubleshooting**

If you run into issues with the host name, you can also rename your host to a unique name. Changing host names also requires remapping drives on the remote hosts to the shared directory.

For the steps to make these changes, see Appendix A, "Changing host names and mapped drives".

### 3.2. Copying the installation files to a shared directory

- 1. On your main host (odmHost1), open the `C:\labfiles\ODMInsights871` directory.

The **ODMInstallers871** folder contains:

- **disk1**
- **disk5**
- `CIS_Silent.xml`

- 2. Copy the **ODMInstallers871** folder to the `C:\SHARE` directory.

### 3.3. Copying the installation files from the main host to the remote hosts

In this step, you open the remote hosts and copy the installation files from the shared folder on the main host to a local folder on the container hosts.

**Important**

If your environment can support running multiple hosts, you can open all the container hosts and do these steps simultaneously on each host.

- 1. Switch to the “container 1” host (containerHost1, or the unique name for your “container 1” host).

**Note**

You should see a text file on the Desktop that is called: container 1



- 2. Create a folder for the installation files.
  - a. Open Windows Explorer.
  - b. Create the following directory for the installation files:  
C:\labfiles
  - c. Copy the **ODMinstallers871** folder from the \\SHARE directory to the new C:\labfiles directory.

**Troubleshooting**

If you are unable to access the \\SHARE directory on the container host, you might need to remap a drive to your main host.

For the steps to map a drive, see Appendix A, "Changing host names and mapped drives".

- 3. Repeat Step 1 and Step 2 on other container hosts (containerHost2 and containerHost3, or the unique names for your “container 2” and “container 3” hosts.).

## Section 4. Running the silent installation on the remote hosts

In this section, you use the command line to install Installation Manager. After Installation Manager is installed, you use Installation Manager to silently install Insight Server.

For this exercise, you install both Installation Manager and Decision Server Insights on one machine at a time. The commands that you use here can be added to a script for further automation.



### Note

For this section, if your environment can support opening multiple hosts, you can run the installation steps simultaneously on the container hosts. Otherwise, you can install each host in sequence.

- \_\_\_ 1. Switch to the containerHost1 workstation (or the unique name for your “container 1” host.)



### Important

If your environment can support running multiple hosts, you can also open the containerHost2 and containerHost3 workstations.

- \_\_\_ 2. Install Installation Manager.

- \_\_\_ a. Open a command prompt window and change the current directory to:

C:\labfiles\ODMinstallers871\disk1\IM64

cd C:\labfiles\ODMinstallers871\disk1\IM64



### Note

You can copy and paste the command lines that are used in this exercise from the `dsi.txt` file in the **C:\labfiles\code** folder that is on the main host. If you want to make the `dsi.txt` file accessible to the remote hosts, you can place it in the **C:\SHARE** folder.

- \_\_\_ b. Run the silent installation of Installation Manager by typing this command.

`installc.exe -silent -acceptLicense -showProgress`

After the Installation Manager is installed on each machine, you see a message that identifies the installation path.

```
Administrator: Command Prompt
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Administrator.WS2008R2X64>cd C:\labfiles\ODMinstallers871\disk1\IM64
C:\labfiles\ODMinstallers871\disk1\IM64>imcl.exe -silent -acceptLicense -showProgress
 25% 50% 75% 100%

Installed com.ibm.cic.agent_1.8.2000.20150303.1526 to the C:\Program Files\IBM\Installation Manager\eclipse directory.

C:\labfiles\ODMinstallers871\disk1\IM64>
```

- \_\_\_ 3. Install Insight Server on each machine.
  - \_\_\_ a. On containerHost1, in the command prompt window, open the directory where you installed Installation Manager: C:\Program Files\IBM\Installation Manager\eclipse\tools
 

```
cd C:\Program Files\IBM\Installation Manager\eclipse\tools
```
  - \_\_\_ b. To install the Decision Server Insights Insight Server, type the following command:
 

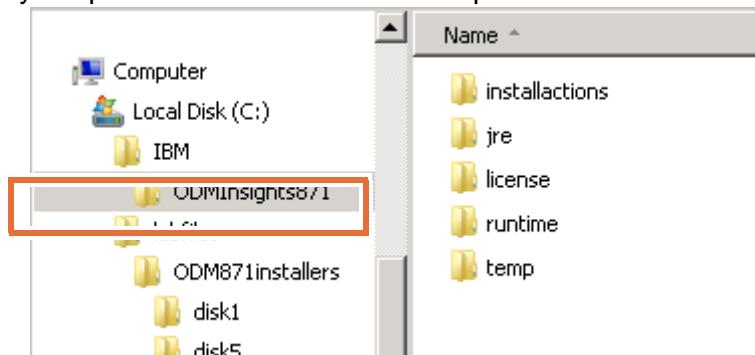
```
imcl.exe -accessRights admin -input
C:\labfiles\ODMinstallers871\CIS_Silent.xml -nosplash -silent
-acceptLicense -showProgress
```

After the silent installation is complete, you see a message that identifies the installation path.

```
Administrator: Command Prompt
C:\Program Files\IBM\Installation Manager\eclipse\tools>cd C:\\"Program Files"\IBM\Installation Manager"\eclipse\tools
C:\Program Files\IBM\Installation Manager\eclipse\tools>imcl.exe -accessRights admin -input C:\labfiles\ODM871installers\CIS_Silent.xml -nosplash -silent -acceptLicense -showProgress
 25% 50% 75% 100%

Modified com.ibm.websphere.cis.ia.v87_8.7.1000.20150417_1926 in the C:\IBM\ODMin sights871 directory.
```

- \_\_\_ 4. Refresh the view in Windows Explorer to verify that Insight Server was installed in the directory that you specified in the installation template.



- \_\_\_ 5. Repeat the steps in this section to install Installation Manager and Decision Server Insights Server this section on containerHost2 and containerHost3.

**End of exercise**

## Exercise review and wrap-up

In this exercise, you installed the Decision Server Insights Insight Server on multiple hosts.

---

# Exercise 13.Configuring Decision Server Insights

## What this exercise is about

In this exercise, you learn how to configure Insight Servers on multiple hosts to create a grid.

## What you should be able to do

After completing this exercise, you should be able to:

- Create and configure catalog, container, and inbound and outbound servers

## Introduction

This exercise includes these sections:

- Section 1, "Creating catalog servers"
- Section 2, "Creating the container servers"
- Section 3, "Creating the inbound and outbound servers"

## Requirements

This exercise requires that Decision Server Insights be installed on odmHost1, containerHost1, containerHost2, and containerHost3. You must also have a mapped drive from the container hosts to odmHost1.

For this exercise, you start on odmHost1. You also work on the container hosts.



The default host names are: **odmHost1**, **containerHost1**, **containerHost2**, and **containerHost3**. If you are in a classroom setting with multiple sets of hosts for students, your hosts might be renamed to other unique host names.

Make sure that you know the host names of the virtual images that you are using and that you use the **actual** host name during the exercises.

---

## Section 1. Creating catalog servers

In this section, you create and customize catalog servers. After you create the server prototype, you modify the `bootstrap.properties` file and the `server.xml` file for each of the catalog servers. You customize the ports that are used by each server and you make sure that each server is aware of the other servers. You also enable majority quorum.

This section includes these steps:

- Section 1.1, "Creating the catalog servers"
- Section 1.2, "Defining the catalog cluster endpoints"
- Section 1.3, "Configuring security and roles"
- Section 1.4, "Enabling quorum"
- Section 1.5, "Starting the catalog servers"
- Section 1.6, "Using REST to verify that the servers are running"
- Section 1.7, "Checking the logs to verify quorum"
- Section 1.8, "Using WebSphere eXtreme Scale xsclmd to check your catalog status"

### 1.1. Creating the catalog servers

- 1. Make sure that you are on `odmHost1`.
- 2. In the command prompt window, type the following command to change directories to the `wlp\runTime` directory.  
`cd C:\IBM\ODMInsights871\runTime\wlp\bin`
- 3. Create the first catalog server, `cisCatalog1`, by typing this command:  
`server create cisCatalog1 --template=cisCatalog`
- 4. Create `cisCatalog2`:  
`server create cisCatalog2 --template=cisCatalog`
- 5. Create `cisCatalog3`:  
`server create cisCatalog3 --template=cisCatalog`

```
C:\IBM\ODMInsights871\runTime\wlp\bin>server create cisCatalog1 --template=cisCatalog
Server cisCatalog1 created.

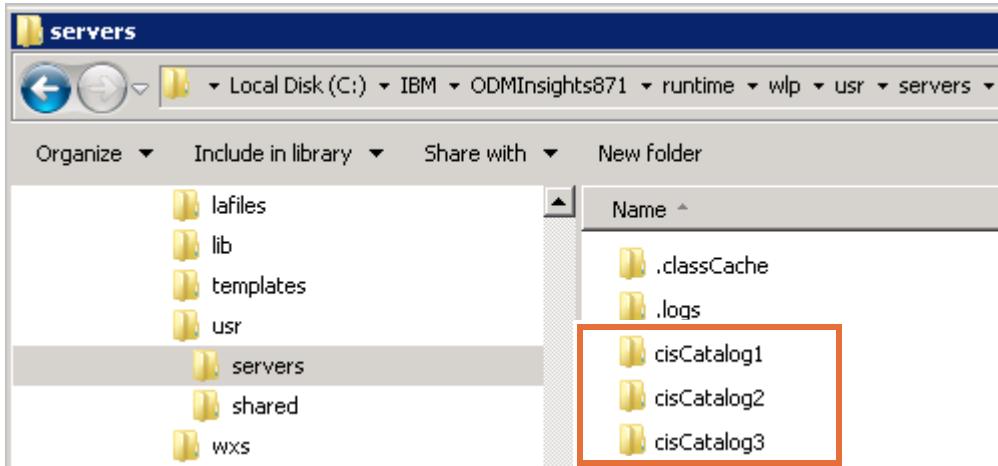
C:\IBM\ODMInsights871\runTime\wlp\bin>server create cisCatalog2 --template=cisCatalog
Server cisCatalog2 created.

C:\IBM\ODMInsights871\runTime\wlp\bin>server create cisCatalog3 --template=cisCatalog
Server cisCatalog3 created.
```

### 1.2. Defining the catalog cluster endpoints

- 1. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runTime\wlp\usr\servers` directory.

You see folders for each of the catalog servers that you created.



- \_\_\_ 2. Edit the cisCatalog1 bootstrap properties.
  - \_\_\_ a. Expand the **cisCatalog1** folder, right-click the `bootstrap.properties` file and click **Edit with Notepad++**.
  - \_\_\_ b. In the `bootstrap.properties` file, find the `ia.clusterEndpoints` property and replace it with the following definition:

```
ia.clusterEndpoints=localhost-cisCatalog1:localhost:6600:6601,localhost-cisCatalog2:localhost:6602:6603,localhost-cisCatalog3:localhost:6604:6605
```

```
25 # The server names, host names and peer connection ports of the catalog servers
26 # e.g. catalogHost01-cisCatalog:catalogHost01:6600:6601,catalogHost02-cisCa
27 "#
28 ia.clusterEndpoints=$(ia.serverName):${(ia.host):6600:6601}
29 "
```



#### Note

You can copy and paste this value from the `dsi.txt` file in the **C:\labfiles\code** folder.

You use this value to set the endpoints for all the catalogs of the cluster so that the catalogs are aware of each other.

- \_\_\_ c. Save the file and close it.
- \_\_\_ 3. Edit the cisCatalog2 bootstrap properties.
  - \_\_\_ a. Expand the **cisCatalog2** folder, right-click the `bootstrap.properties` file and click **Edit with Notepad++**.
  - \_\_\_ b. In the `bootstrap.properties` file, find the `ia.clusterEndpoints` property and replace it with the following definition:

```
ia.clusterEndpoints=localhost-cisCatalog1:localhost:6600:6601,localhost-cisCatalog2:localhost:6602:6603,localhost-cisCatalog3:localhost:6604:6605
```

\_\_ c. Replace the port values in the file to match these values.

- http.port=9081
- https.port=9444
- ia.listenerPort=2810

 **Note**

Because the catalogs are on the same host for this exercise, you must modify the ports to avoid conflicts.

\_\_ d. Save the file and close it.

\_\_ 4. Edit the cisCatalog3 bootstrap properties.

\_\_ a. Expand the **cisCatalog3** folder, right-click the `bootstrap.properties` file and click **Edit with Notepad++**.

\_\_ b. In the `bootstrap.properties` file, find the `ia.clusterEndpoints` property and replace the value with the following value:

```
ia.clusterEndpoints=localhost-cisCatalog1:localhost:6600:6601,localhost-cisC
atalog2:localhost:6602:6603,localhost-cisCatalog3:localhost:6604:6605
```

\_\_ c. Replace the port values in the file to match these values.

- http.port=9082
- https.port=9445
- ia.listenerPort=2811

\_\_ d. Save the file and close it.

### 1.3. Configuring security and roles

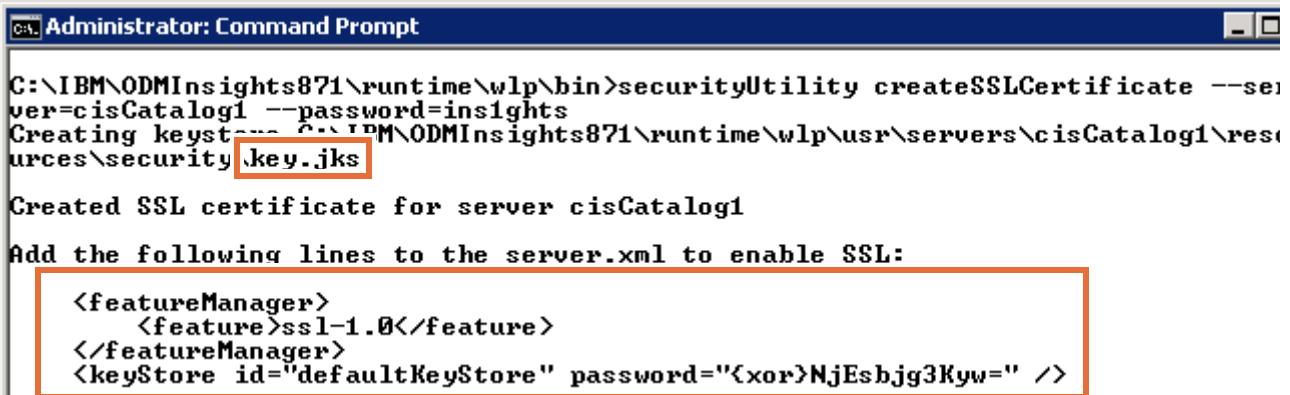
\_\_ 1. In a command prompt window, make sure that you are in the `wlp\runTime\bin` directory.

You can type the following command to change directories to the `wlp\runTime\bin` directory:

```
cd C:\IBM\ODMInsights871\runTime\wlp\bin
```

- 
- 2. Configure the security for cisCatalog1 by typing this command:

```
securityUtility createSSLCertificate --server=cisCatalog1
--password=insights
```



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt". The command entered is "securityUtility createSSLCertificate --server=cisCatalog1 --password=insights". The output shows the key store being created at "C:\IBM\ODMInsights871\runtime\wlp\bin> C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisCatalog1\resources\security\key.jks" and a message stating "Created SSL certificate for server cisCatalog1". Below this, a note says "Add the following lines to the server.xml to enable SSL:" followed by the XML code for the featureManager and keyStore elements.

```
C:\IBM\ODMInsights871\runtime\wlp\bin>securityUtility createSSLCertificate --server=cisCatalog1 --password=insights
Creating keystore C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisCatalog1\resources\security\key.jks
Created SSL certificate for server cisCatalog1
Add the following lines to the server.xml to enable SSL:
<featureManager>
 <feature>ssl-1.0</feature>
</featureManager>
<keyStore id="defaultKeyStore" password="<%>NjEsbjg3Kyw=%" />
```

- An SSL certificate is created for cisCatalog1 in the **resources\security** folders. The response in the command prompt window shows the encrypted password that you must add to the **server.xml** file.
- 3. Leave the command prompt window open.
  - 4. Copy the keystore to share with the other servers.

- a. Open Windows Explorer and go to the **C:\IBM\ODMInsights871\runtime\wlp\usr\servers** directory.
  - b. Expand the newly created **resources\security** folder in the **cisCatalog1** folder. This folder, which contains **key.jks**, must be copied to the other catalog server folders. An SSL certificate is created for cisCatalog1 in the **resources\security** folders.
- c. Copy the **resources** folder from the **cisCatalog1** folder to the **cisCatalog2** and **cisCatalog3** folders.
- 5. Copy the **resources** folder from the **cisCatalog1** folder to the **C:\SHARE** directory to share with the remote hosts.
  - 6. Add the security and roles to the server files for the catalogs.
- a. In the **cisCatalog1** folder, open the **server.xml** file (with Notepad++) and look for the "TODO" sections.

- \_\_ b. In the keystore section, copy the encrypted password that was returned from the command line.

```
<keyStore id="defaultKeyStore" password="{xor}NjEsbjg3Kyw=" />
```

```
<!-- *TODO* Add SSL configuration including a key store and
 optionally a trust store. For example:
```

```
<keyStore
 id="defaultKeyStore"
 password="(xor)NjEsbjg3Kyw=" />
```

```
-->
```

- \_\_ c. Move the closing comment line (--) before the keystore section so that the keystore is not commented out.

```
<!-- *TODO* Add SSL configuration including a key store and
 optionally a trust store. For example:
```

```
-->
<keyStore
 id="defaultKeyStore"
 password="{xor}NjEsbjg3Kyw=" />
```

- \_\_ d. In the basicRegistry section, replace the section with the following lines:

```
<basicRegistry id="basic" realm="DWRealm">
 <user name="admin" password="inslghts"/>
 <group name="DWGroup">
 <member name="admin"/>
 </group>
</basicRegistry>
```

- \_\_ e. Move the basicRegistry entry outside of the commented section.

- \_\_ f. In the administrator-role section, insert the group name: DWGroup

```
<administrator-role>
 <group>DWGroup</group>
</administrator-role>
```

- \_\_ g. Move the administrator-role entry outside of the commented section.



## Troubleshooting

Make sure that all your new entries to the server.xml file are outside the commented sections. Otherwise, you cannot access your servers later by using REST.

- \_\_ h. Save the file and close it.

- 
- \_\_\_ 7. Copy and replace the `server.xml` file from **cisCatalog1** folder to the **cisCatalog2** and **cisCatalog3** folders.

All the catalog servers can share the `server.xml` file.

## 1.4. Enabling quorum

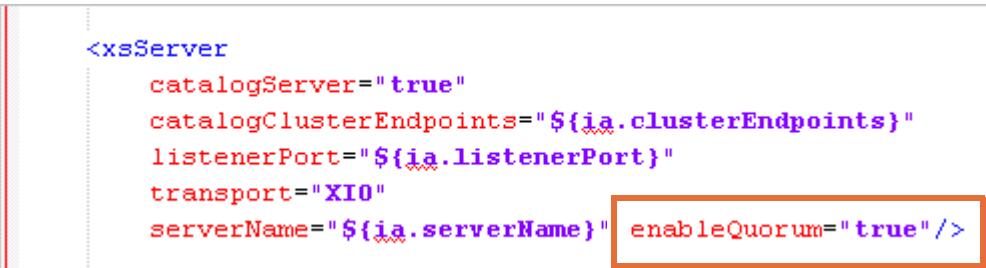
To enable quorum, you edit two files for each catalog server:

- `server.xml`
  - `jvm.options`
- \_\_\_ 1. Set the `enableQuorum` property in the `server.xml` file.
    - \_\_\_ a. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runTime\wlp\usr\servers` directory and expand the **cisCatalog1** folder.
    - \_\_\_ b. Open the `server.xml` file (with Notepad++) and locate the `xsServer` entry.

```
<xsServer
 catalogServer="true"
 catalogClusterEndpoints="${ia.clusterEndpoints}"
 listenerPort="${ia.listenerPort}"
 transport="XIO"
 serverName="${ia.serverName}" />
```

- \_\_\_ c. Append this line before the closing bracket (`/>`):

```
enableQuorum="true"
```



```
<xsServer
 catalogServer="true"
 catalogClusterEndpoints="${ia.clusterEndpoints}"
 listenerPort="${ia.listenerPort}"
 transport="XIO"
 serverName="${ia.serverName}" enableQuorum="true"/>
```

- \_\_\_ d. Save the file and close it.
- \_\_\_ 2. Set the `com.ibm.websphere.objectgrid.server.catalog.majority.quorum` property.
  - \_\_\_ a. In the **cisCatalog1** folder in the `C:\IBM\ODMInsights871\runTime\wlp\usr\servers` directory, open the `jvm.options` file (with Notepad++).

- 
- \_\_ b. After the list of properties that start with “-D”, append this line:

```
-Dcom.ibm.websphere.objectgrid.server.catalog.majority.quorum=true
```

```
-Djava.endorsed.dirs=.../.../wxs/lib/endorsed
-Dorg.osgi.framework.bootdelegation=com.ibm.wsspi.runtime
-Djava.library.path=
-Dorg.apache.xml.dtm.DTManager=org.apache.xml.dtm.ref.DTManagerDefault
-DX10_OSGI=LATESTVERSION
-Dcom.ibm.xs.xio.transport.disableSSL=true
-Dcom.ibm.websphere.objectgrid.server.catalog.majority.quorum=true
```

```
* PIPARAP APP LDP DIACTM SUPPORTED PIPARAP SPECIFICATION
```

- \_\_ c. Save the file and close it.

\_\_ 3. Repeat Step 1 and Step 2 for cisCatalog2.

\_\_ 4. Repeat Step 1 and Step 2 for cisCatalog3.

Next, you start the servers and verify that they are running and that quorum is enabled.

## 1.5. Starting the catalog servers

\_\_ 1. Open three command prompt windows, and in each, go to the wlp\runtime\bin directory.

You can type the following command to change directories to the wlp\runtime\bin directory.

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

\_\_ 2. Start all the servers.

- \_\_ a. In command window 1, type the following command and press Enter:

```
server start cisCatalog1
```

- \_\_ b. In command window 2, type the following command and press Enter:

```
server start cisCatalog2
```

- \_\_\_ c. In command window 3, type the following command and press Enter:

```
server start cisCatalog3
```

```
C:\IBM\ODMInsights871\runtime\wlp\bin>server start cisCatalog1
Starting server cisCatalog1.
Server cisCatalog1 started.

C:\IBM\ODMInsights871\runtime\wlp\bin>

C:\IBM\ODMInsights871\runtime\wlp\bin>server start cisCatalog2
Starting server cisCatalog2.
Server cisCatalog2 started.

C:\IBM\ODMInsights871\runtime\wlp\bin>

C:\IBM\ODMInsights871\runtime\wlp\bin>server start cisCatalog3
Starting server cisCatalog3.
Server cisCatalog3 started.

C:\IBM\ODMInsights871\runtime\wlp\bin>_
```



#### Note

You must start all the catalogs together. Because the catalogs are configured to be aware of each other, if you start one while the others are not yet started, an error is thrown.



#### Troubleshooting

If you are unable to start a catalog server, you might need to check the logs for errors or problems. The **logs** folder for each catalog is in the catalog server folder. For example, to see the log for the **cisCatalog1** server, open the **messages** file in the **C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisCatalog1\logs** directory.

## 1.6. Using REST to verify that the servers are running

- 1. Open a browser to use the REST API to check that the catalog servers are running.
  - a. In a browser, type:  
`https://localhost:9443/IBMJMXConnectorREST`
  - b. If you get a security warning, confirm the exception and continue.
- 2. When prompted to sign in, use:
  - **User name:** admin
  - **Password:** insights

The browser returns a message that confirms the connection.



## 1.7. Checking the logs to verify quorum

- 1. Open the log file for the cisCatalog1 server.
  - a. In the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisCatalog1` directory, expand the **cisCatalog1\logs** folder.
  - b. Double-click the **messages** file to open the log.
- 2. Search for “quorum” to find the following confirmation message:

Quorum is enabled for the catalog service.

```
I CWOBJ2518I: Starting the ObjectGrid catalog service: localhost-cisCatalog1 for domain DefaultDomain.
I CWOBJ1251I: Quorum is enabled for the catalog service.
I CWOBJ2514I: Waiting for ObjectGrid server activation to complete.
```

- 3. Close the file.

## 1.8. Using WebSphere eXtreme Scale xscmd to check your catalog status

- 1. Check the quorum status of the catalogs by typing this command:

```
xscmd -c showQuorumStatus -cep localhost:2809
```

```
C:\Administrator: Command Prompt
ontainer1_C-0
SynchronousReplica 126 reachable 172.16.80.146 DefaultZone localhost-cis
ontainer2_C-1
CWXSI0040I: The routetable command completed successfully.
Ending at: 2015-05-28 10:38:48.550

C:\IBM\ODMInsights871\runtime\wlp\bin>xscmd -c showQuorumStatus -cep localhost:2809
Starting at: 2015-05-28 10:39:21.034
CWXSI0068I: Executing command: showQuorumStatus
Server Host Quorum Quorum Size Active Servers
----- ----- ---- ---- ---- -----
localhost-cisCatalog1 172.16.80.148 TRUE 2 localhost-cisCatalog1,
 localhost-cisCatalog2,
 localhost-cisCatalog3
localhost-cisCatalog2 172.16.80.148 TRUE 2 localhost-cisCatalog1,
 localhost-cisCatalog2,
 localhost-cisCatalog3
localhost-cisCatalog3 172.16.80.148 TRUE 2 localhost-cisCatalog1,
 localhost-cisCatalog2,
 localhost-cisCatalog3
CWXSI0040I: The showQuorumStatus command completed successfully.
Ending at: 2015-05-28 10:39:22.909
```

The quorum status is enabled (TRUE) for all the catalogs.

- 2. Show the primary catalog by typing this command.

```
xscmd -c showPrimaryCatalogServer -cep localhost:2809
```

```
C:\IBM\ODMInsights871\runtime\wlp\bin>xscmd -c showPrimaryCatalogServer -cep localhost:2809
Starting at: 2015-05-09 09:52:55.070
CWXSI0068I: Executing command: showPrimaryCatalogServer
Server Host Primary
----- ----- -----
localhost-cisCatalog1 172.16.80.118 TRUE
localhost-cisCatalog2 172.16.80.118 FALSE
localhost-cisCatalog3 172.16.80.118 FALSE
CWXSI0040I: The showPrimaryCatalogServer command completed successfully.
Ending at: 2015-05-09 09:52:57.054
```

The “primary” status for cisCatalog1 server is set to TRUE to show that it is the master catalog server.

## Section 2. Creating the container servers

In this section, you create and configure the container servers on the remote hosts.

### 2.1. Creating cisContainer1

- 1. Switch to the containerHost1 host.



**Stop**

The default host name for the “container 1” host is **containerHost1**. Your “container 1” host might have a different name.

- 2. Open a new command prompt window and change to this directory:

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```



**Hint**

You can copy and paste the command lines from the `dsi.txt` file in the **C:\Labfiles\code** folder on your other hosts. To do so, copy the `dsi.txt` file to the shared directory to make the file available to the remote hosts.

On the odmHost1 host, copy the `dsi.txt` file in the **C:\Labfiles\code** to **C:\SHARE**.

- 3. Type the following command to create the container server

```
server create cisContainer1 --template=cisContainer
```

### 2.2. Customizing the container

- 1. Modify the endpoints for the grid by editing the `bootstrap.properties` file for the container.

- a. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers` directory, and expand the **cisContainer1** folder.
- b. Open the `bootstrap.properties` file (withNotepad++) and locate the `ia.bootstrapEndpoints` property.
- c. Set the property to the listener ports of the catalog servers in your topology.

```
ia.bootstrapEndpoints=odmHost1:2809,odmHost1:2810,odmHost1:2811
```

```
The host names and client listener ports of the catalog servers
e.g. catalogHost01:2809,catalogHost02:2809,...
#
```

```
ia.bootstrapEndpoints=odmHost1:2809,odmHost1:2810,odmHost1:2811
```

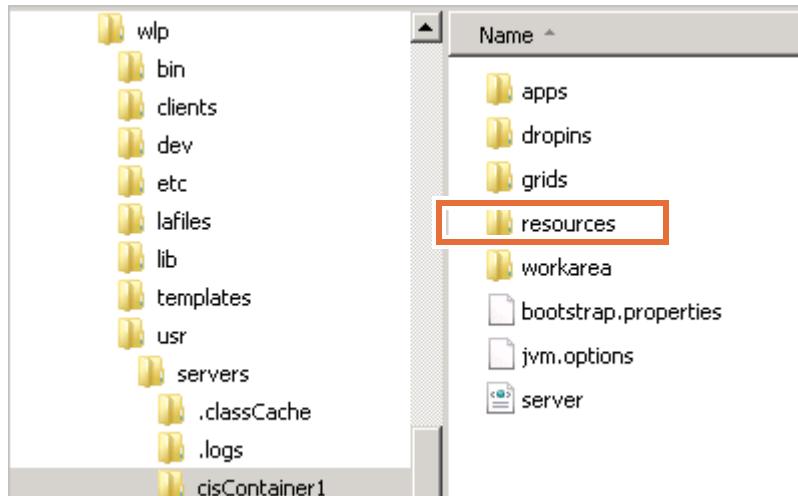


## Stop

The default host name for the main host is **odmHost1**.

If your host has a different name, replace odmHost1 in the property value with the **actual** host name for your main host.

- \_\_\_ d. Save the file and close it.
- \_\_\_ 2. Reduce the heap size to ensure that memory does not grow beyond the physical memory of the machine.
  - \_\_\_ a. In the **cisContainer1** folder, and open the `jvm.options` file (with Notepad++) and locate the `-Xmx` property.
  - \_\_\_ b. Change the value to: `-Xmx3g`
- \_\_\_ c. Save the file and close it.
- \_\_\_ 3. Define the security and roles for the container.
- \_\_\_ a. On containerHost1, go to the mapped SHARE(`\\\odmHost1`) directory and copy the **resources** folder to the  
`C:\\IBM\\ODMInsights871\\runtime\\wlp\\usr\\servers\\cisContainer1` directory.



- \_\_\_ 4. In the `server.xml` file, configure the security and roles.
- \_\_\_ a. Open the `server.xml` file (with Notepad++) and locate the "TODO" section.
- \_\_\_ b. Uncomment the keystore section and replace it with the following text:  
`<keyStore id="defaultKeyStore" password="{xor}NjEsbjg3Kyw=" />`



### Hint

If you want to copy and paste from the `dsi.txt` file that is in the **C:\labfiles\code** folder on your main host (odmHost1), you can move that file to the `C:\SHARE` directory.

- \_\_ c. Uncomment the user registry section and replace the `basicRegistry` entries to match this text:

```
<basicRegistry id="basic" realm="DWRealm">
 <user name="admin" password="inslghts"/>
 <group name="DWGroup">
 <member name="admin" />
 </group>
</basicRegistry>
```

- \_\_ d. Uncomment the `administrator-role` entry and replace it with the following text:

```
<administrator-role>
 <group>DWGroup</group>
</administrator-role>
```

- \_\_ e. Uncomment the authorization for the REST section:

```
<authorization-roles id="iaAuthorization">
 <security-role name="iaRESTWriter">
 <group name="*INSERT_GROUP_NAME*" />
 </security-role>
 <security-role name="iaRESTReader">
 <group name="*INSERT_GROUP_NAME*" />
 </security-role>
</authorization-roles><group = "*INSERT_GROUP_NAME*" />
```

- \_\_ f. Replace it with this text:

```
<authorization-roles id="iaAuthorization">
 <security-role name="iaRESTWriter">
 <group name="DWGroup" />
 </security-role>
 <security-role name="iaRESTReader">
 <group name="DWGroup" />
 </security-role>
</authorization-roles>
```

- g. Verify that each of the sections that you edited are not enclosed within commented text.

```
<!-- *TODO* Add SSL configuration including a key store and
 ... optionally a trust store. For example:
-->
<keyStore
 id="defaultKeyStore"
 password="{xor}NjEsbjg3Kyw=" />

<!-- *TODO* Add basic or LDAP user registry configuration.
 ... For example:
-->
<basicRegistry id="basic" realm="DWRealm">
 <user name="admin" password="insights"/>
 <group name="DWGroup">
 <member name="admin"/>
 </group>
</basicRegistry>

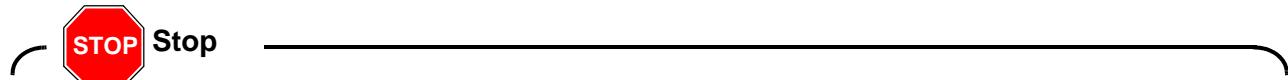
<!-- *TODO* Configure authorization roles for server administration.
 ... For example:
-->
<administrator-role>
 <group>DWGroup</group>
</administrator-role>

<!-- *TODO* Configure authorization roles for the CIS REST API
 ... For example:
-->
<authorization-roles id="iaAuthorization">
 <security-role name="iaRESTWriter">
 <group name="DWGroup" />
 </security-role>
 <security-role name="iaRESTReader">
 <group name="DWGroup" />
 </security-role>
</authorization-roles>
```

- \_\_ h. Save the file and close it.
  - \_\_ 5. Copy the server.xml file from the cisContainer1 directory to the mapped SHARE drive.  
You can reuse this server.xml file for the other containers.

## 2.3. Creating and configuring cisContainer2

- ## 1. Switch to the containerHost2 host.

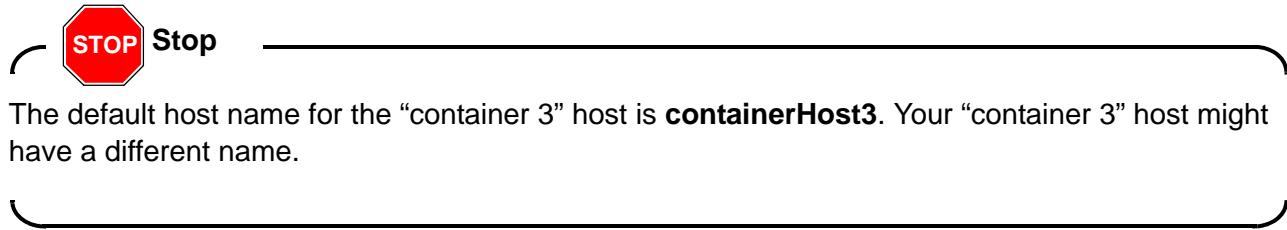


The default host name for the “container 2” host is **containerHost2**. Your “container 2” host might have a different name.

- 
- \_\_\_ 2. Create the cisContainer2 server.
    - \_\_\_ a. Open a new command prompt window and change to this directory:  
cd C:\IBM\ODMInsights871\runtime\wlp\bin
    - \_\_\_ b. Type the following command to create the container server  
server create cisContainer2 --template=cisContainer
  - \_\_\_ 3. Configure security by reusing the **resources** folder and the `server.xml` file from mapped **SHARE** drive.
    - \_\_\_ a. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers` directory, and expand the **cisContainer2** folder.
    - \_\_\_ b. In a separate Windows Explorer window, go to the **SHARE** directory.
    - \_\_\_ c. Select the **resources** folder in the **SHARE** directory and drag it to the `cisContainer2` directory.
    - \_\_\_ d. Select the `server.xml` file in the **SHARE** directory and drag it to the `cisContainer2` directory to replace the existing file.
  - \_\_\_ 4. Configure the bootstrap endpoints.
    - \_\_\_ a. In the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer2` directory, open the `bootstrap.properties` file (with Notepad++).
    - \_\_\_ b. Locate the `ia.bootstrapEndpoints` property and replace the entry with the following text:  
`ia.bootstrapEndpoints=odmHost1:2809,odmHost1:2810,odmHost1:2811`
    - \_\_\_ c. Save the file and close it.
  - \_\_\_ 5. Configure the JVM heap size.
    - \_\_\_ a. In the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer2` directory, open the `jvm.options` file (with Notepad++).
    - \_\_\_ b. Locate the `-Xmx` property and replace the entry to: `-Xmx3g`
    - \_\_\_ c. Save the file and close it.

## 2.4. Creating and configuring cisContainer3

- \_\_\_ 1. Switch to the containerHost3 host.



- 
- \_\_\_ 2. Create the cisContainer3 server.
    - \_\_\_ a. Open a new command prompt window and change to this directory:  
cd C:\IBM\ODMInsights871\runtime\wlp\bin
    - \_\_\_ b. Type the following command to create the container server  
server create cisContainer3 --template=cisContainer
  - \_\_\_ 3. Configure security by reusing the **resources** folder and the **server.xml** file from mapped **SHARE** drive.
    - \_\_\_ a. In Windows Explorer, go to the C:\IBM\ODMInsights871\runtime\wlp\usr\servers directory, and expand the **cisContainer3** folder.
    - \_\_\_ b. In a separate Windows Explorer window, go to the **SHARE** directory.
    - \_\_\_ c. Select the **resources** folder in the **SHARE** directory and drag it to the **cisContainer3** directory.
    - \_\_\_ d. Select the **server.xml** file in the **SHARE** directory and drag it to the **cisContainer3** directory to replace the existing file.
  - \_\_\_ 4. Configure the bootstrap endpoints.
    - \_\_\_ a. In the C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer3 directory, open the **bootstrap.properties** file (withNotepad++).
    - \_\_\_ b. Locate the **ia.bootstrapEndpoints** property and replace the entry with the following text:  
ia.bootstrapEndpoints=odmHost1:2809,odmHost1:2810,odmHost1:2811
    - \_\_\_ c. Save the file and close it.
  - \_\_\_ 5. Configure the JVM heap size.
    - \_\_\_ a. In the C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer3 directory, open the **jvm.options** file (withNotepad++).
    - \_\_\_ b. Locate the **-Xmx** property and replace the entry to: **-Xmx3g**
    - \_\_\_ c. Save the file and close it.

## 2.5. Starting the container servers

- \_\_\_ 1. Open containerHost1 and start cisContainer1.
  - \_\_\_ a. In a command prompt window, make sure that you are in the **runtime\wlp\bin** directory.  
cd C:\IBM\ODMInsights871\runtime\wlp\bin
  - \_\_\_ b. Start the server by typing this command:  
server start cisContainer1



### Note

The server can take a few minutes to start. When the server is started, you see the message:

```
Server cisContainer1 started.
```

While you are waiting, you can start the server on containerHost2.

2. Switch to containerHost2 and start cisContainer2.

- \_\_ a. In a command prompt window, make sure that you are in the `runtime\wlp\bin` directory.

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- \_\_ b. Start the server by typing this command:

```
server start cisContainer2
```



### Note

The server can take a few minutes to start. When the server is started, you see the message:

```
Server cisContainer2 started.
```

While you are waiting, you can start the server on containerHost3.

3. Switch to containerHost3 and start cisContainer3.

- \_\_ a. In a command prompt window, make sure that you are in the `runtime\wlp\bin` directory.

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- \_\_ b. Start the server by typing this command:

```
server start cisContainer3
```

## 2.6. Using WebSphere eXtreme Scale xscmd to check your container status

1. Switch to the main host (odmHost1).

2. Make sure all the containers are running and accessible to the catalogs.

- \_\_ a. In a command prompt window, make sure that you are in this directory:

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- 
- \_\_ b. Type the following command:

```
xscmd -c listHosts -cep localhost:2809
```

```
C:\IBM\ODMInsights871\runtime\wlp\bin>xscmd -c listHosts -cep localhost:2809
Starting at: 2015-05-09 09:47:55.601
CWXSI0068I: Executing command: listHosts

*** Show all online hosts for com.ibm.ia.global.runtime data grid and iaGrMaps map set.
 172.16.80.24
 172.16.80.119
 172.16.80.120
 Hosts matching = 3
 Total known containers = 3
 Total known hosts = 3

*** Show all online hosts for com.ibm.ia.runtime.cluster data grid and iaConfigMaps map set.
 172.16.80.24
 172.16.80.119
 172.16.80.120
 Hosts matching = 3
 Total known containers = 3
 Total known hosts = 3

*** Show all online hosts for com.ibm.ia.preload data grid and iaPreloadMaps map set.
 172.16.80.24
 172.16.80.119
 172.16.80.120
 Hosts matching = 3
 Total known containers = 3
 Total known hosts = 3

*** Show all online hosts for com.ibm.ia data grid and iaMaps map set.
 172.16.80.24
 172.16.80.119
 172.16.80.120
 Hosts matching = 3
 Total known containers = 3
 Total known hosts = 3
CWXSI0040I: The listHosts command completed successfully.
Ending at: 2015-05-09 09:47:57.820
```

All the grid container servers and their IP addresses are listed.

---

## Section 3. Creating the inbound and outbound servers

In this section, you configure the inbound and outbound servers on `odmHost1`.

### 3.1. Creating the inbound and outbound servers

- 1. Switch to `odmHost1`, open a command prompt window and change to this directory:

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- 2. Type the following command to create the inbound server

```
server create cisInbound1 --template=cisInbound
```

- 3. Type the following command to create the outbound server.

```
server create cisOutbound1 --template=cisOutbound
```

### 3.2. Customizing the inbound and outbound servers

- 1. Copy the `key.jks` from the `cisCatalog1` server to the `cisInbound1` and `cisOutbound1` servers.
  - a. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers` directory.
  - b. Expand the `cisCatalog1` directory, and copy the **resources** folder.
  - c. Expand the `cisInbound1` directory and paste the **resources** folder.
  - d. Expand the `cisOutbound1` directory and paste the **resources** folder.
- 2. Modify the ports and endpoint properties in the `bootstrap.properties` file.
  - a. In the `servers\cisInbound1` directory, open the `bootstrap.properties` file (with Notepad++) and set these properties for the **cisInbound1** server:

```
http.port=9083
https.port=9446
ia.bootstrapEndpoints=localhost:2809,localhost:2810,localhost:2811
```
  - b. Save the file and close it.
  - c. In the `servers\cisOutbound1` directory, open the `bootstrap.properties` file (with Notepad++) and set the properties for the **cisOutbound1** server.

```
http.port=9084
https.port=9447
ia.bootstrapEndpoints=localhost:2809,localhost:2810,localhost:2811
```
  - d. Save the file and close it.



## Stop

Make sure that the ports are set correctly in the `bootstrap.properties` file. Port conflict causes later exercises to fail.

- 3. Edit the security information for the inbound server to match `cisCatalog1`.
  - a. In the `servers\cisInbound1` directory, open the `server.xml` file (with Notepad++) and find the “TODO” section.
  - b. In the keystore section, replace `*INSERT_ENCODED_PASSWORD*` with the encrypted password.

```
<keyStore id="defaultKeyStore" password="{xor}NjEsbjg3Kyw=" />
```



## Hint

You can copy and paste from the `dsi.txt` file.

- c. Edit the basic registry section to use these values:

```
<basicRegistry id="basic" realm="DWRealm">
 <user name="admin" password="inslghts" />
 <group name="DWGroup">
 <member name="admin" />
 </group>
</basicRegistry>
```

- d. Edit the role section by replacing `*INSERT_GROUP_NAME*` with this group value: DWGroup
- ```
<administrator-role>
  <group>DWGroup</group>
</administrator-role>
```

-
- ___ e. Make sure each of the modified sections are not enclosed within commented text.

```
<!-- *TODO* Add SSL configuration including a key store and
     |   optionally a trust store. For example:
-->
<keyStore
    id="defaultKeyStore"
    password="{xor}NjEsbjg3Kyw=" />

<!-- *TODO* Add basic or LDAP user registry configuration.
     |   For example:
-->
<basicRegistry id="basic" realm="DWRealm">
    <user name="admin" password="insights"/>
    <group name="DWGroup">
        <member name="admin"/>
    </group>
</basicRegistry>

<!-- *TODO* Configure authorization roles for server administration.
     |   For example:
-->
<administrator-role>
    <group>DWGroup</group>
</administrator-role>
```

- ___ f. Save the server.xml file and close it.

- ___ 4. Repeat Step 3 for the outbound server in the servers\cisOutbound1 directory.

3.3. Starting the inbound and outbound servers

- ___ 1. In the command prompt window, make sure that you are in the runtime\wlp\bin directory.

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- ___ 2. Run the start command for the outbound server.

```
server start cisOutbound1
```

- ___ 3. Run the start command for the inbound server.

```
server start cisInbound1
```

End of exercise

Exercise review and wrap-up

In this exercise, you configured the various Decision Server Insights server types on multiple hosts.

Exercise 14. Managing deployment and connectivity

What this exercise is about

In this exercise, you learn how to deploy solutions. You also learn how to generate and deploy inbound and outbound connectivity configurations.

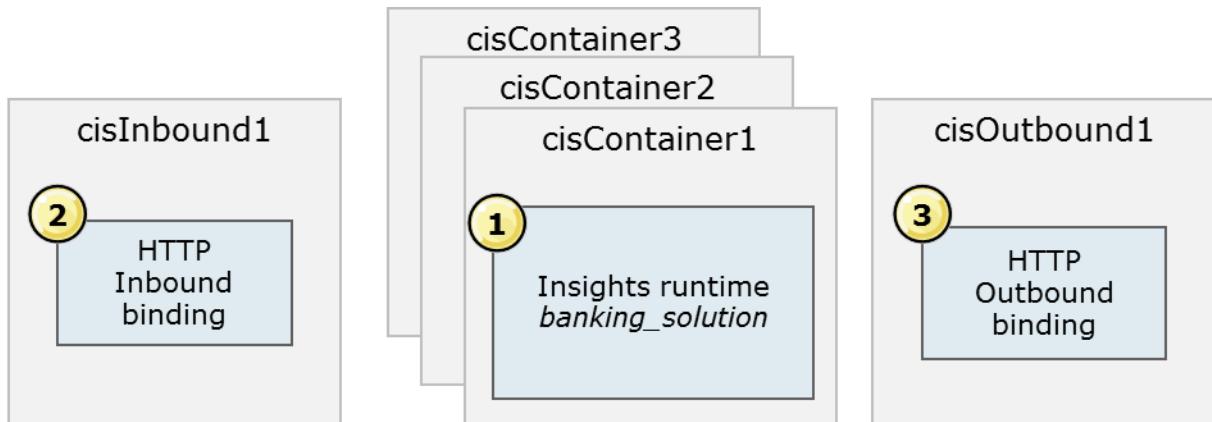
What you should be able to do

After completing this exercise, you should be able to:

- Deploy solutions across the grid
- Configure inbound and outbound endpoints
- Deploy and activate inbound and outbound connectivity configurations

Introduction

In this exercise, you deploy a solution to the grid containers. You also deploy to the inbound and outbound servers to handle inbound and outbound events.



1. Deploy solution to grid containers
2. Generate and deploy inbound configuration to inbound server
3. Generate and deploy outbound configuration to outbound server

This exercise includes these sections:

- Section 1, "Deploying the solution to the grid"
- Section 2, "Generating connectivity configurations"
- Section 3, "Deploying connectivity"
- Section 4, "Testing connectivity"

Requirements

This exercise requires that you complete Exercise 13, "Configuring Decision Server Insights".

For this exercise, you work on **odmHost1**.



Warning

The default host names are: **odmHost1**, **containerHost1**, **containerHost2**, and **containerHost3**.

Make sure that you know the host names of the virtual images that you are using and that you use the **actual** host name during the exercises.

Section 1. Deploying the solution to the grid

You can deploy the solution to the remote containers from odmHost1. To help you deploy to each server, you can create connection property files that contain all the parameters that are expected by the command-line scripts.

Connection properties files are stored in the *Install\Di\runtime\ia\etc* folder.

1.1. Creating connection property files

- 1. Make sure that you are on the main host, odmHost1.



Stop

All the steps in this exercise are performed on the main host. Check that you are on odmHost1 (or the unique host name that is assigned to your main host).

- 2. Create a `connection.properties` file so you can connect remotely to the container server on the `containerHost1`.
 - a. In the `C:\IBM\ODMInsights871\runTime\ia\etc` directory, copy the `connections.properties` file and rename it: `connectionC1.properties`
 - b. Edit the `connectionC1.properties` file (with Notepad++) to match these values.

```
server=cisContainer1
host=containerHost1 (or the actual name or IP address of your container 1 server)
port=9443
username=admin
password=ins1ghts
trustStoreLocation=${wlp.user.dir}/servers/cisCatalog1/resources/security
/key.jks
trustStorePassword=ins1ghts
sslProtocol=TLS
disableSSLHostnameVerification=true
```



Warning

The default container host names are: `containerHost1`, `containerHost2`, and `containerHost3`.

Make sure that you use the **actual** host name or IP address to define the `host` value in the connection properties files.

- ___ 3. Create a connection properties file so you can connect remotely to the container server on the containerHost2.
- ___ a. Copy the connectionC1.properties and rename it: connectionC2.properties
- ___ b. Edit the following values in the connectionC2.properties file (with Notepad++).
- server=cisContainer2**
- host=containerHost2** (or the actual name or IP address of your container 2 server)
- ___ 4. Create a connection properties file so you can connect remotely to the container server on the containerHost3.
- ___ a. Copy the connectionC1.properties and rename it: connectionC3.properties
- ___ b. Edit the following values in the connectionC3.properties file (with Notepad++).
- server=cisContainer3**
- host=containerHost3** (or the actual name or IP address of your container 3 server)

**Note**

Each container server uses the default ports on their hosts, so you do not modify the ports.

- ___ 5. Create a connection.properties file for the inbound server.
- ___ a. In the C:\IBM\ODMInsights871\runtime\ia\etc directory, copy the connectionsC1.properties file and rename it: connectionIn1.properties
- ___ b. Edit the connectionIn1.properties file (with Notepad++) to match these values.
- server=cisInbound1**
- host=localhost**
- port=9446**
- username=admin**
- password=inslghts**
- trustStoreLocation=\${wlp.user.dir}/servers/cisCatalog1/resources/security/key.jks**
- trustStorePassword=inslghts**
- sslProtocol=TLS**
- disableSSLHostnameVerification=true**
- ___ 6. Create a connection.properties file for the outbound server.
- ___ a. In the C:\IBM\ODMInsights871\runtime\ia\etc directory, copy the connectionIn1.properties file and rename it: connectionOut1.properties
- ___ b. Edit the connectionOut1.properties file (with Notepad++) to match these values.
- server=cisOutbound1**

```

host=localhost
port=9447
username=admin
password=insights
trustStoreLocation=${wlp.user.dir}/servers/cisCatalog1/resources/security
/key.jks
trustStorePassword=insights
sslProtocol=TLS
disableSSLHostnameVerification=true

```

**Hint**

If you want to verify that your connection properties files are correct, you can use the connection properties files that are in the **C:\labfiles\code** folder.

1.2. Deploying the solution archive (.esa) to the grid

- 1. Make sure all the catalogs and containers are running.
- 2. Deploy the `banking_scenario_solution` solution to the first container.
 - a. Make sure that you are in the `ia\bin` directory.
 - b. Type the following remote deployment command.

```

solutionManager deploy remote
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
--propertiesFile=../etc/connectionC1.properties

```

**Hint**

You can copy and paste the commands from the `dsl.txt` file that is in the **C:\labfiles\code** folder.

After deployment finishes, you see a message: Solution successfully deployed.

```

C:\IBM\ODMInsights871\runtime\ia\bin>solutionManager deploy remote C:\labfiles\code\bank\banking_scenario_solution-1.1.esa --propertiesFile=../etc/connectionC1.properties
May 18, 2015 7:02:38 PM com.ibm.ia.common.jmx.JMXUtils
WARNING: CWMBD9712W: Hostname verification is disabled by the "disableSSLHostnameVerification" connection property. The client will not check the hostname specified.
Solution successfully deployed.

```

- ___ 3. You can verify the deployment by typing:

```
solutionManager list remote --propertiesFile=..\etc\connectionC1.properties
```

- ___ 4. Deploy the second container by typing this command:

```
solutionManager deploy remote  
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa  
--propertiesFile=../etc/connectionC2.properties
```

- ___ 5. Deploy to the third container by typing this command:

```
solutionManager deploy remote  
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa  
--propertiesFile=../etc/connectionC3.properties
```

- ___ 6. You can use REST to verify the deployment.

- ___ a. Open a browser and type this URL:

<http://containerHost2:9080/ibm/ia/rest/solutions>



Warning

Make sure that you use the **actual** host name or IP address for “**containerHost2**” in this URL.

- ___ b. Accept any security certificates for the browser and continue.

- ___ c. When prompted for authorization, use this login:

- **User name:** admin
- **Password:** inslghts



Note

The URL automatically switches to a secure connection
(<https://containerhost2:9443/ibm/ia/rest/solutions>).

Section 2. Generating connectivity configurations

In this section, you generate and edit the inbound and outbound endpoint configurations, validate, and deploy them.

2.1. Preparing the inbound application and configuration

- 1. Make sure that the inbound and outbound servers are running.
- 2. Generate an inbound application EAR.

- a. Make sure that you are in the ia\bin directory.

```
cd C:\IBM\ODMInsights871\runtime\ia\bin
```

- b. Type the following connectivityManager command.

```
connectivityManager generate application
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking_scenario_solution-inbound.ear
```

After generation finishes, you see a “Successfully generated” message.

```
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager generate application C:\labfiles\code\bank\banking_scenario_solution-1.1.esa C:\labfiles\code\bank\banking_scenario_solution-inbound.ear
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
CWMBE1148I: Writing to the output file: C:\labfiles\code\bank\banking_scenario_solution-inbound.ear
CWMBE1474I: Successfully generated the solution inbound connectivity application file: C:\labfiles\code\bank\banking_scenario_solution-inbound.ear
```

- 3. Generate the XML configuration file for deploying inbound connectivity by typing this command.

```
connectivityManager generate config
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking-server-inbound-config.xml
--inboundEndpoints="*"
```

```
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager generate config C:\labfiles\code\bank\banking_scenario_solution-1.1.esa C:\labfiles\code\bank\banking-server-inbound-config.xml --inboundEndpoints="*"
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
CWMBE1491I: Generated a template for the missing resource "banking1" used by the endpoint "banking1" of the solution "banking_scenario_solution" in the file "C:\labfiles\code\bank\banking-server-inbound-config.xml".
CWMBE1494I: Successfully generated a template solution connectivity configuration file "C:\labfiles\code\bank\banking-server-inbound-config.xml" for the solution "banking_scenario_solution".
```

- 4. Edit the newly generated configuration file to edit it.

- a. In the C:\labfiles\code\bank directory, right-click the banking-server-inbound-config.xml file and open it with Notepad++.

- __ b. Uncomment the application section by deleting the comments around the application definition at the top of the file.
- __ c. At the bottom of the file, uncomment the HTTP endpoint definition.

The endpoint configuration is now ready for deployment.

```

<application location="banking_scenario_solution-inbound.ear">
    <application-bnd>
        <security-role name="iaEventSubmitter"/>
    </application-bnd>
</application>

<!--Generated configuration for endpoint: banking1-->

<ia inboundHttpEndpoint endpoint="banking scenario solution/banking1" />
</server>

```

- __ d. Close the file.

2.2. Preparing the outbound configuration

- __ 1. Generate a configuration to deploy on the outbound server by typing this command.

```

connectivityManager generate config
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking-server-outbound-config.xml
--outboundEndpoints="*"

```

- __ 2. Edit the newly generated configuration file to edit it.

- __ a. In the C:\labfiles\code directory, open the banking-server-outbound-config.xml file (with Notepad++).
- __ b. Uncomment the HTTP endpoint definition by deleting the comments around the application definition at the top of the file.

```

<!--Generated configuration for endpoint: notificationToClient-->

<ia outboundHttpEndpoint endpoint=
    "banking_scenario_solution/notificationToClient" />
</server>

```

- __ c. Close the file.

2.3. Validating the connectivity configurations

- __ 1. Validate the inbound configuration by typing the following command:

```

connectivityManager validate
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking-server-inbound-config.xml

```

The result shows a validated inbound endpoint.

2. Validate the outbound configuration by typing the following command:

```
connectivityManager validate  
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa  
C:\labfiles\code\bank\banking-server-outbound-config.xml
```

After running the validation commands, the result shows one validated inbound endpoint and one validated outbound endpoint.

```
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager validate C:\labfiles\code\bank\banking_scenario_solution-1.1.esa C:\labfiles\code\bank\banking-server-inbound-config.xml  
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa  
CWMBE1475I: The connectivity server configuration file for the solution "banking_scenario_solution" contains the configuration required for the specified endpoints.  
CWMBE1496I: Number of inbound endpoints validated: 1  
CWMBE1497I: Number of outbound endpoints validated: 0  
  
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager validate C:\labfiles\code\bank\banking-server-outbound-config.xml  
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa  
CWMBE1475I: The connectivity server configuration file for the solution "banking_scenario_solution" contains the configuration required for the specified endpoints.  
CWMBE1496I: Number of inbound endpoints validated: 0  
CWMBE1497I: Number of outbound endpoints validated: 1
```

Section 3. Deploying connectivity

In this section, you deploy the connectivity configurations to the inbound and outbound servers.

- 1. Deploy the inbound configuration by typing this command:

```
connectivityManager deploy local
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking-server-inbound-config.xml
--propertiesFile=../etc/connectionIn1.properties
```

- 2. Deploy the outbound configuration by typing this command:

```
connectivityManager deploy local
C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
C:\labfiles\code\bank\banking-server-outbound-config.xml
--propertiesFile=../etc/connectionOut1.properties
```

After deploying finishes, the result shows the successfully deployed and activated inbound and outbound endpoints.

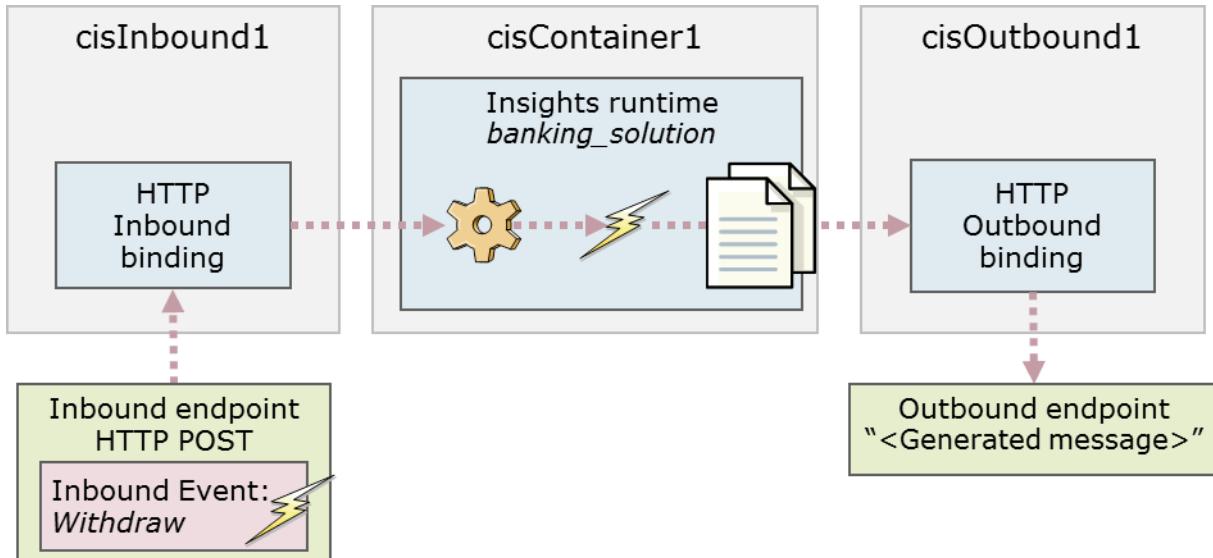
```
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager deploy local C:\labfiles\code\bank\banking_scenario_solution-1.1.esa C:\labfiles\code\bank\banking-server-inbound-config.xml --propertiesFile=../etc/connectionIn1.properties
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
CWMBE1475I: The connectivity server configuration file for the solution "banking_scenario_solution" contains the configuration required for the specified endpoints.
CWMBE1148I: Writing to the output file: C:\Users\ADMINI~1.WS2\AppData\Local\Temp\2\banking_scenario_solution-inbound.ear4209336278908656182.tmp
CWMBE1144I: Successfully copied the file from "C:\Users\Administrator.WS2008R2X64\AppData\Local\Temp\2\banking_scenario_solution-inbound.ear4209336278908656182.tmp" to "C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisInbound1\banking_scenario_solution-inbound.ear".
CWMBE1144I: Successfully copied the file from "C:\labfiles\code\bank\banking-server-inbound-config.xml" to "C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisInbound1\banking_scenario_solution-config.xml".
CWMBE1452I: Successfully deployed connectivity for the solution "banking_scenario_solution".
CWMBE1454I: Successfully activated connectivity for the solution "banking_scenario_solution".
CWMBE1498I: Number of active inbound endpoints: 1
CWMBE1499I: Number of active outbound endpoints: 0
```



```
C:\IBM\ODMInsights871\runtime\ia\bin>connectivityManager deploy local C:\labfiles\code\bank\banking_scenario_solution-1.1.esa C:\labfiles\code\bank\banking-server-outbound-config.xml --propertiesFile=../etc/connectionOut1.properties
CWMBE1146I: Reading the input file: C:\labfiles\code\bank\banking_scenario_solution-1.1.esa
CWMBE1475I: The connectivity server configuration file for the solution "banking_scenario_solution" contains the configuration required for the specified endpoints.
CWMBE1144I: Successfully copied the file from "C:\labfiles\code\bank\banking-server-outbound-config.xml" to "C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisOutbound1\banking_scenario_solution-config.xml".
CWMBE1452I: Successfully deployed connectivity for the solution "banking_scenario_solution".
CWMBE1454I: Successfully activated connectivity for the solution "banking_scenario_solution".
CWMBE1498I: Number of active inbound endpoints: 0
CWMBE1499I: Number of active outbound endpoints: 1
```

Section 4. Testing connectivity

In this section, you test that your endpoints are correctly configured to submit and receive events and messages.



You use two additional tools:

- For the inbound event producer: HttpRequester Add-on to Mozilla Firefox
- For the outbound endpoint monitor: TCP/IP Monitor in Eclipse

For the event submissions, you use the text that is provided in these files of the `C:\labfiles\code\bank` directory.

- `client.txt`
- `withdraw.txt`

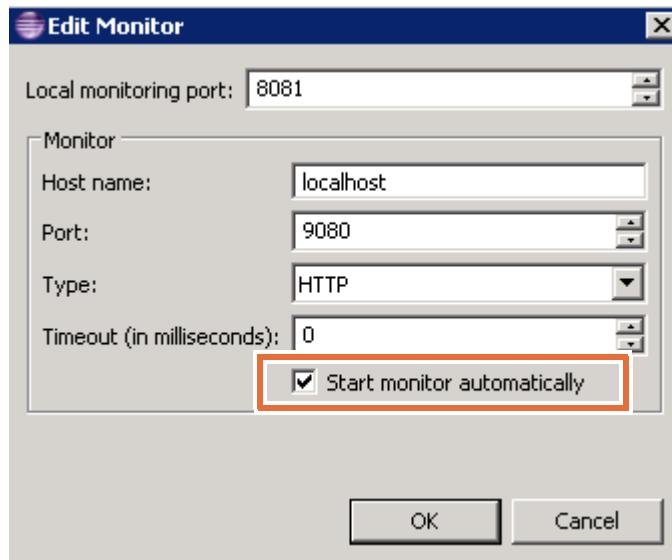
4.1. Setting up TCP/IP monitoring in Eclipse

- 1. Open Insight Designer.
- a. Go to **Start > All Programs > IBM > Decision Server Insights V8.7.1 > Insight Designer V8.7.1**.
- b. When prompted for a workspace path in the Workspace Launcher, type:
`C:\Training\workspaces\dsi`
- 2. On the Welcome view, click **Workbench**.

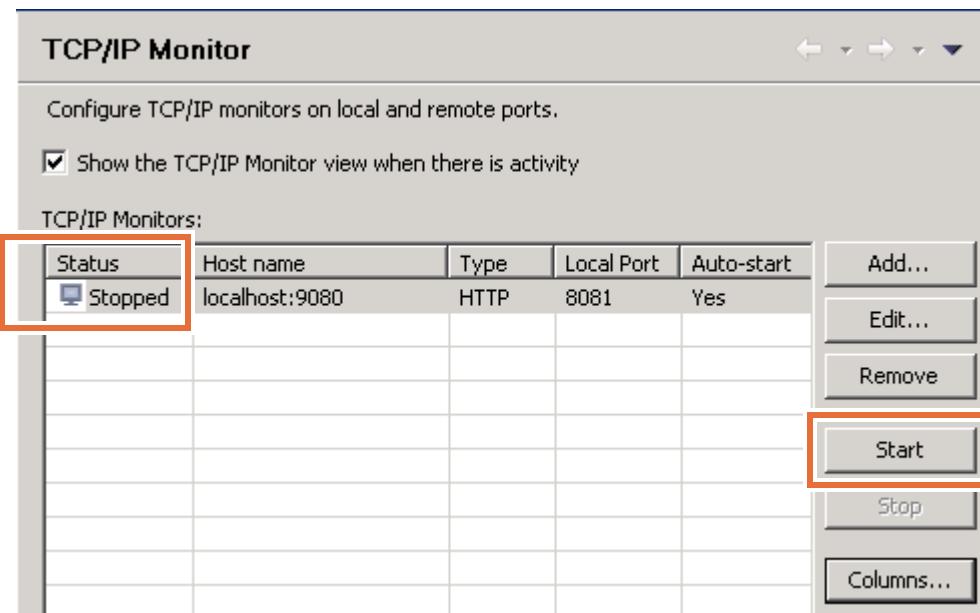


Insight Designer opens by default to the Java perspective. For this exercise, you use the Java perspective only.

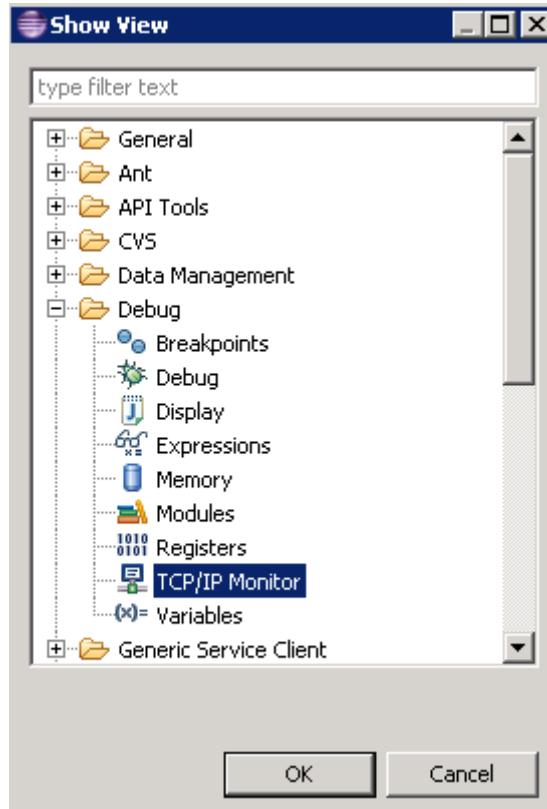
3. Define the TCP/IP monitoring settings from the **Windows > Preferences** menu.
- __ a. Click **Windows > Preferences**.
 - __ b. In the Preferences dialog box, expand **Run/Debug** and click **TCP/IP Monitor**.
 - __ c. On the TCP/IP Monitor page, click **Add**.
 - __ d. Define the monitoring settings with these values:
 - **Local monitoring port:** 8081
 - **Host name:** localhost
 - **Port:** 9080
 - **Type:** HTTP
 - __ e. Select **Start monitor automatically**.



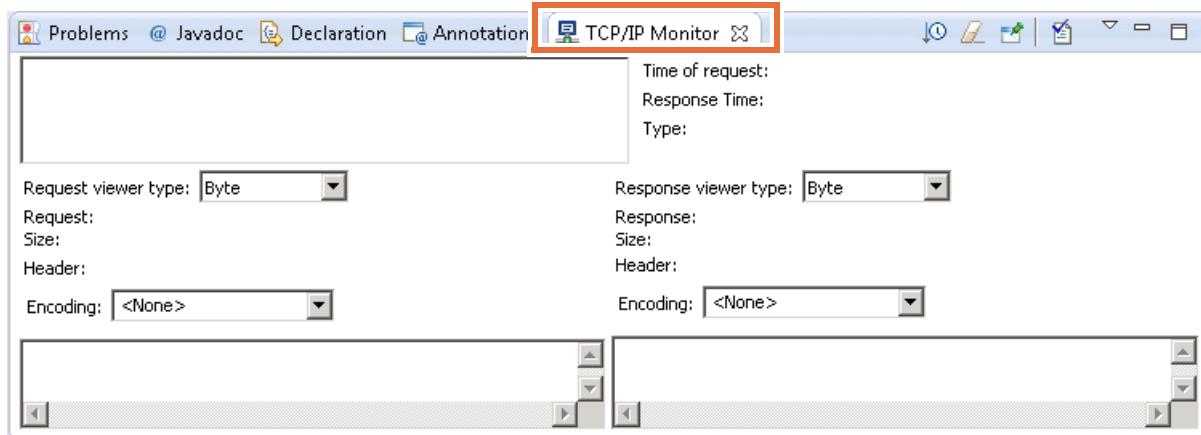
- __ f. Click **OK**.
- __ g. If the **Status** field for the newly added monitor is "Stopped", click **Start**.



- ___ h. Click **OK** to close the Preferences dialog box.
- ___ 4. Open the **TCP/IP Monitor** view in the Java perspective.
- ___ a. From the **Window** menu, click **Show View > Other**.
- ___ b. In the **Show View** dialog box, select **Debug > TCP/IP Monitor** and click **OK**.



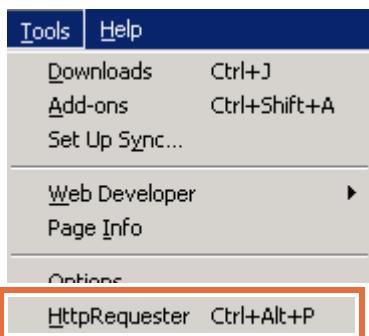
The **TCP/IP Monitor** view opens and is ready to monitor your outbound events on port 8081.



You leave Insight Designer running. Next, you use a browser to submit events.

4.2. Submitting events through the HttpRequester

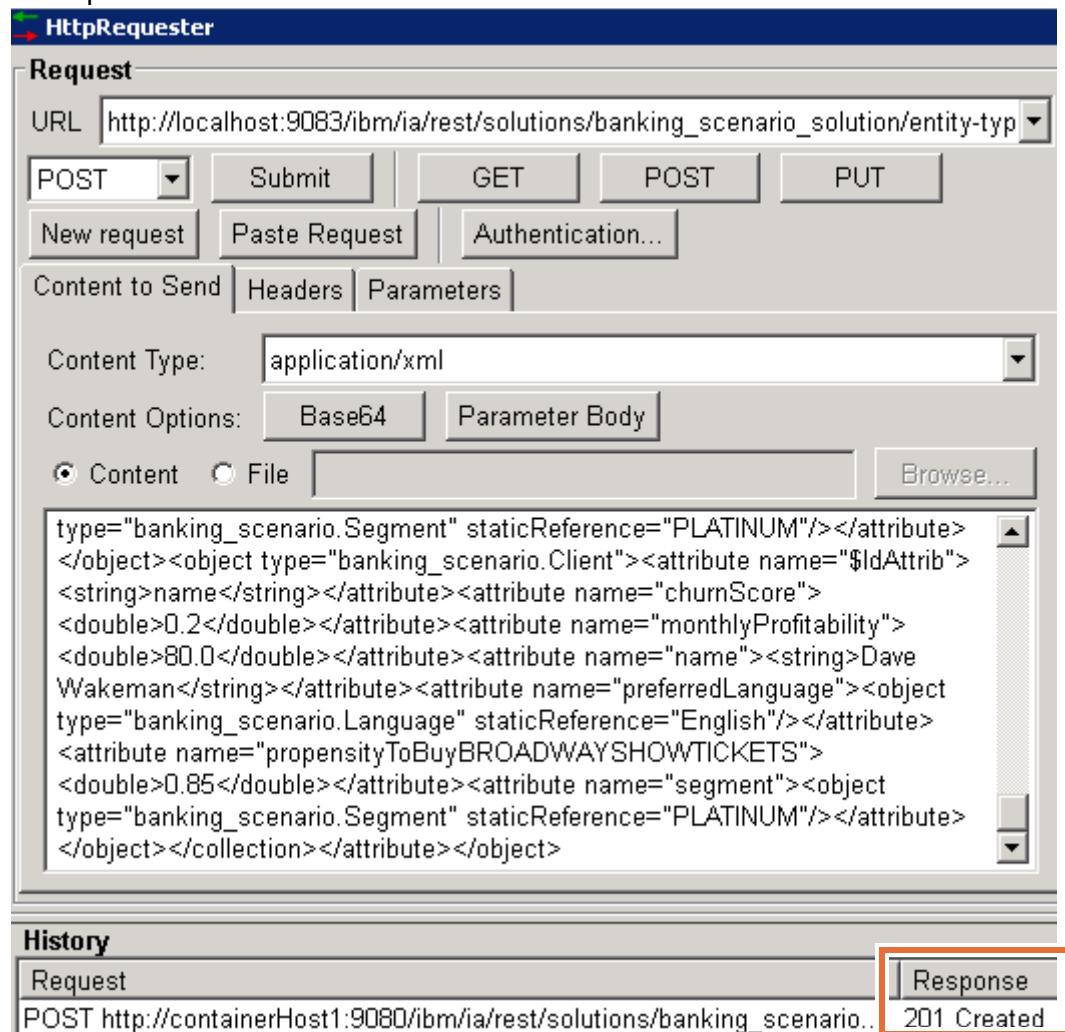
- 1. Open the Mozilla Firefox browser and on the **Tools** menu, click **HttpRequester**.



You can also click the **HttpRequester** icon  on the toolbar.

- 2. Use HttpRequester to submit a REST API POST method to create entities for the banking_scenario_solution that runs on containerHost1.
- a. In the **URL** field of the dialog box, type this URL:
`http://containerHost1:9080/ibm/ia/rest/solutions/banking_scenario_solution/entity-types/banking_scenario.Client/entities`
 - b. Select **POST** from the method list.
 - c. In the **Content Type** field, select **application/xml**.
 - d. In the C:\labfiles\code\bank directory, double-click the `client.txt` file to open it in a text editor and copy the text (press Ctrl+A and press Ctrl+C).
 - e. Paste the text from the `client.txt` file to the **Content** field of HttpRequester (press Ctrl+V).
 - f. Click **Submit**.
 - g. If prompted for authentication, use `admin/insights` as the user name and password.

The response is returned as 201 Created.



- ___ 3. Use the POST method to submit a withdrawal event to the inbound server.
 - ___ a. In the **URL** field of the dialog box, type this URL:
`http://localhost:9083/banking/incoming`
 - ___ b. Select **POST** in the method list.
 - ___ c. In the **Content Type** field, select **application/xml**.
 - ___ d. Open the `C:\labfiles\code\bank` directory, copy the text from the `withdraw.txt` file.
 - ___ e. Replace the test in the **Content** field with the text from the `withdraw.txt` file by pressing **Ctrl+A** to select all the text, and then press **Ctrl+V** to paste over that text.
 - ___ f. Click **Submit**.

The response is returned as 200 OK.

The screenshot shows the HttpRequester interface. In the 'Request' tab, the URL is set to `http://localhost:9083/banking/incoming`. The method dropdown shows 'POST'. Below the URL, there are buttons for 'Submit', 'GET', 'POST', and 'PUT'. Underneath these are buttons for 'New request', 'Paste Request', and 'Authentication...'. The 'Content to Send' tab is selected, showing the XML content:

```

<m:county>NONE</m:county>
<m:land>NONE</m:land>
<m:location>
<p:coordinates>0.0</p:coordinates>
<p:coordinates>0.0</p:coordinates>
</m:location>
<m:state>NONE</m:state>
</m:Withdrawal>

```

The 'Content Type' is set to `application/xml`. Under 'Content Options', 'Base64' is selected. The 'Content' radio button is selected, and there is a 'Browse...' button. The 'History' tab shows a single entry: a 'Request' row with 'POST http://localhost:9083/banking/incoming' and a 'Response' row with '200 OK'.



Note

If you want to rerun the test, you can use the DELETE method to delete the client entities that you created with these settings:

- **URL:** `http://containerHost1:9080/ibm/ia/rest/solutions/banking_scenario_solution/entity-types/banking_scenario.Client/entities`
- **Method:** `DELETE`
- **Content Type:** `application/xml`
- **Content:** Text that is copied from the `client.txt` file

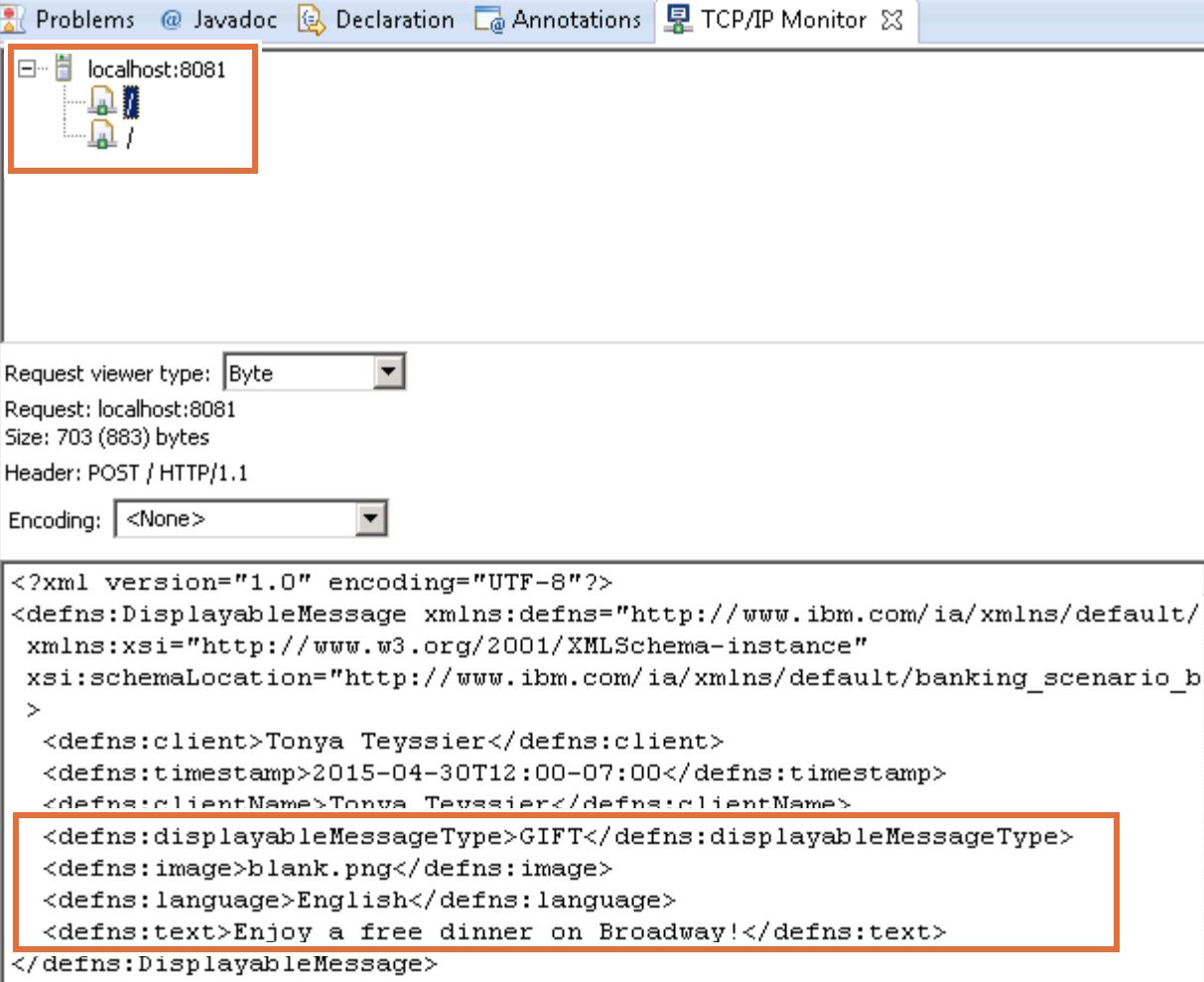
4.3. Verifying the outbound connectivity

Next, you find out whether the event submitted to the inbound server was correctly processed and generates messages that should be sent to the outbound endpoint. If the connectivity is set up correctly, the outbound server sends the messages to the outbound endpoint.

1. Return to the TCP/IP Monitor window in Eclipse.

You should see two responses that are captured by the monitor.

2. Select the first response and view the outbound displayable message event that is returned.



The screenshot shows the Eclipse IDE interface with the 'TCP/IP Monitor' perspective selected. In the top navigation bar, the 'TCP/IP Monitor' tab is active. Below it, a tree view shows a connection to 'localhost:8081' with several sub-items, one of which is highlighted with a red box. The main content area displays an XML message. At the top of the message pane, there are dropdown menus for 'Request viewer type:' (set to 'Byte'), 'Request:' (showing 'localhost:8081'), 'Size:' (703 (883) bytes), 'Header:' (POST / HTTP/1.1), and 'Encoding:' (<None>). The XML message itself is as follows:

```
<?xml version="1.0" encoding="UTF-8"?>
<defns:DisplayableMessage xmlns:defns="http://www.ibm.com/ia/xmlns/default/
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ibm.com/ia/xmlns/default/banking_scenario_b
>
  <defns:client>Tonya Teyssier</defns:client>
  <defns:timestamp>2015-04-30T12:00-07:00</defns:timestamp>
  <defns:clientName>Tonya Teyssier</defns:clientName>
  <defns:displayableMessageType>GIFT</defns:displayableMessageType>
  <defns:image>blank.png</defns:image>
  <defns:language>English</defns:language>
  <defns:text>Enjoy a free dinner on Broadway!</defns:text>
</defns:DisplayableMessage>
```

- ___ 3. Select the second response and view the outbound displayable message event that is returned.

Request viewer type:

Request: localhost:8081
Size: 718 (898) bytes
Header: POST / HTTP/1.1

Encoding:

```
<?xml version="1.0" encoding="UTF-8"?>
<defns:DisplayableMessage xmlns:defns="http://www.ibm.com/ia/xmlns/default/
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.ibm.com/ia/xmlns/default/banking_scenario_b
>
  <defns:client>Tonya Teyssier</defns:client>
  <defns:timestamp>2015-04-30T12:00-07:00</defns:timestamp>
  <defns:clientName>Tonya Teyssier</defns:clientName>
  <defns:displayableMessageType>PRODUCT_RECOMMENDATION</defns:displayableMe
  <defns:image>broadway.png</defns:image>
  <defns:language>English</defns:language>
  <defns:text>See Broadway show tonight!</defns:text>
</defns:DisplayableMessage>
```

- ___ 4. Close Eclipse.
___ 5. Close HttpRequester.
___ 6. Close the client.txt and withdraw.txt files.

End of exercise

Exercise review and wrap-up

In the first part of this exercise, you deployed a solution to the grid. You then configured and deployed connectivity to the inbound and outbound connectivity servers, and you tested your deployment.

Exercise 15. Administering Decision Server Insights

What this exercise is about

In this exercise, you learn how to manage security, deploy solutions, and monitor the grid.

What you should be able to do

After completing this exercise, you should be able to:

- Monitor and manage the hosts in a Decision Server Insights grid

Introduction

This exercise includes these sections:

- Section 1, "Monitoring the grid"
- Section 2, "Using the server administration scripts"
- Section 3, "Creating a trace file"

Requirements

This exercise requires that you complete Exercise 14, "Managing deployment and connectivity".

For this exercise, you start on the main host (odmHost1). You also work on the container hosts.

Section 1. Monitoring the grid

In this section, you use the WebSphere eXtreme Scale xsclmd utility to monitor the servers in your grid. You used some of these commands to verify your configuration during Exercise 13, "Configuring Decision Server Insights".

- ___ 1. Make sure that you are on the main host (odmHost1).
- ___ 2. Make sure all the catalogs and containers are running.

- ___ a. In a command prompt window, make sure that you are in this directory:

```
cd C:\IBM\ODMInsights871\runtime\wlp\bin
```

- ___ b. Type the following command:

```
xsclmd -c listHosts -cep localhost:2809
```

```
C:\IBM\ODMInsights871\runtime\wlp\bin>xsclmd -c listHosts -cep localhost:2809
Starting at: 2015-05-09 09:47:55.601
CWXS10068I: Executing command: listHosts

*** Show all online hosts for com.ibm.ia.global.runtime data grid and iaGrMaps map set.
  172.16.80.24
  172.16.80.119
  172.16.80.120
Hosts matching      = 3
Total known containers = 3
Total known hosts    = 3

*** Show all online hosts for com.ibm.ia.runtime.cluster data grid and iaConfigMaps map set.
  172.16.80.24
  172.16.80.119
  172.16.80.120
Hosts matching      = 3
Total known containers = 3
Total known hosts    = 3

*** Show all online hosts for com.ibm.ia.preload data grid and iaPreloadMaps map set.
  172.16.80.24
  172.16.80.119
  172.16.80.120
Hosts matching      = 3
Total known containers = 3
Total known hosts    = 3

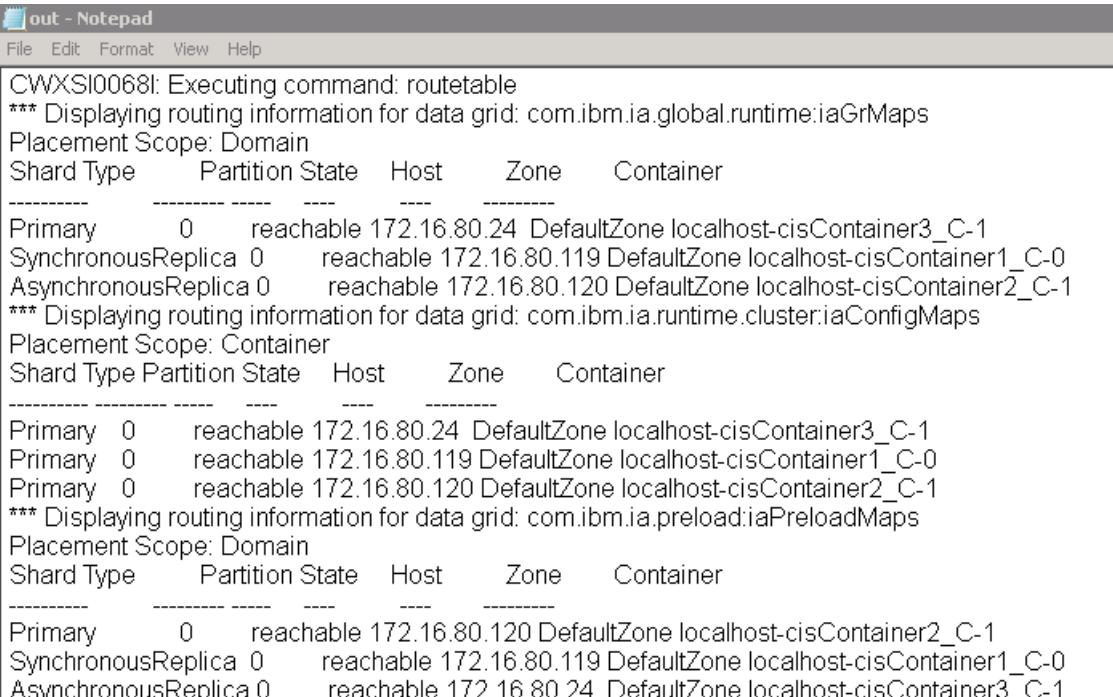
*** Show all online hosts for com.ibm.ia data grid and iaMaps map set.
  172.16.80.24
  172.16.80.119
  172.16.80.120
Hosts matching      = 3
Total known containers = 3
Total known hosts    = 3
CWXS10040I: The listHosts command completed successfully.
Ending at: 2015-05-09 09:47:57.820
```

All the grid container servers and their IP addresses are listed.

- ___ 3. Show all partitions on the online hosts for the data grid by typing this command:

```
xsclmd -c routetable -cep localhost:2809 > out.txt
```

The result is too large to see in the command prompt window. To view the complete result, you can open the `out.txt` file in the `C:\IBM\ODMInsights871\runtime\wlp\bin` directory.



```

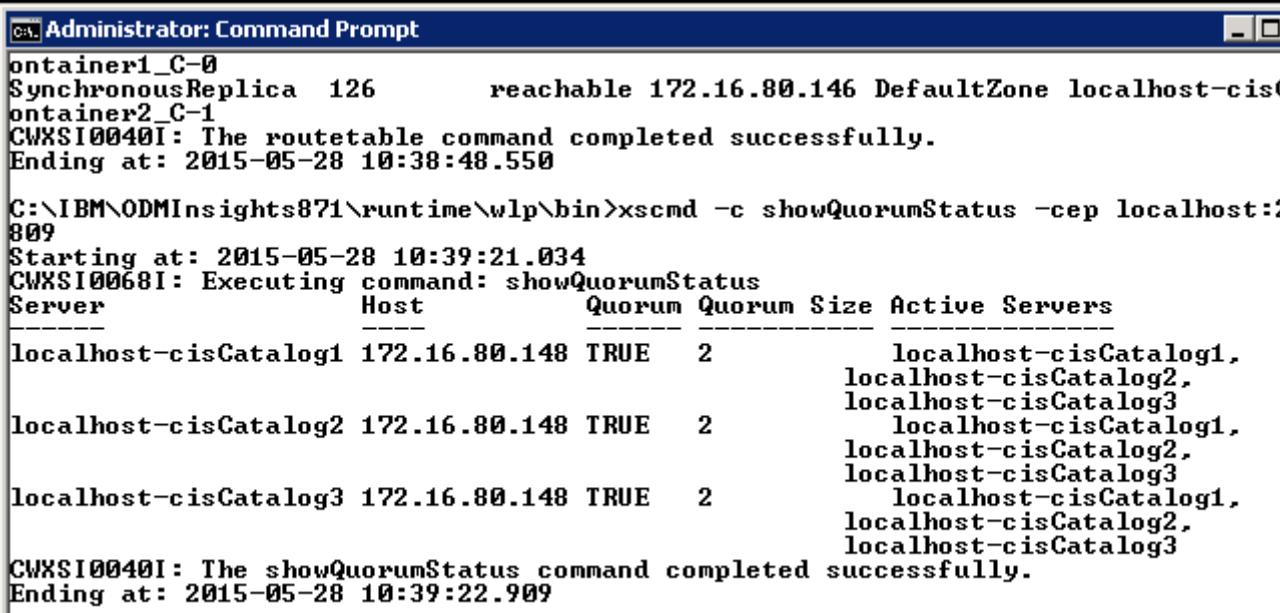
out - Notepad
File Edit Format View Help

CWXSI0068I: Executing command: routetable
*** Displaying routing information for data grid: com.ibm.ia.global.runtime:iaGrMaps
Placement Scope: Domain
Shard Type Partition State Host Zone Container
-----
Primary 0 reachable 172.16.80.24 DefaultZone localhost-cisContainer3_C-1
SynchronousReplica 0 reachable 172.16.80.119 DefaultZone localhost-cisContainer1_C-0
AsynchronousReplica 0 reachable 172.16.80.120 DefaultZone localhost-cisContainer2_C-1
*** Displaying routing information for data grid: com.ibm.ia.runtime.cluster:iaConfigMaps
Placement Scope: Container
Shard Type Partition State Host Zone Container
-----
Primary 0 reachable 172.16.80.24 DefaultZone localhost-cisContainer3_C-1
Primary 0 reachable 172.16.80.119 DefaultZone localhost-cisContainer1_C-0
Primary 0 reachable 172.16.80.120 DefaultZone localhost-cisContainer2_C-1
*** Displaying routing information for data grid: com.ibm.ia.preload:iaPreloadMaps
Placement Scope: Domain
Shard Type Partition State Host Zone Container
-----
Primary 0 reachable 172.16.80.120 DefaultZone localhost-cisContainer2_C-1
SynchronousReplica 0 reachable 172.16.80.119 DefaultZone localhost-cisContainer1_C-0
AsynchronousReplica 0 reachable 172.16.80.24 DefaultZone localhost-cisContainer3_C-1

```

- 4. Check the quorum status of the catalogs by typing this command:

```
xscmd -c showQuorumStatus -cep localhost:2809
```



```

Administrator: Command Prompt
ontainer1_C-0
SynchronousReplica 126      reachable 172.16.80.146 DefaultZone localhost-cis
ontainer2_C-1
CWXSI0040I: The routetable command completed successfully.
Ending at: 2015-05-28 10:38:48.550

C:\IBM\ODMInsights871\runtime\wlp\bin>xscmd -c showQuorumStatus -cep localhost:2809
Starting at: 2015-05-28 10:39:21.034
CWXSI0068I: Executing command: showQuorumStatus
Server          Host           Quorum Quorum Size Active Servers
-----
localhost-cisCatalog1 172.16.80.148 TRUE   2      localhost-cisCatalog1,
                                                               localhost-cisCatalog2,
                                                               localhost-cisCatalog3
localhost-cisCatalog2 172.16.80.148 TRUE   2      localhost-cisCatalog1,
                                                               localhost-cisCatalog2,
                                                               localhost-cisCatalog3
localhost-cisCatalog3 172.16.80.148 TRUE   2      localhost-cisCatalog1,
                                                               localhost-cisCatalog2,
                                                               localhost-cisCatalog3
CWXSI0040I: The showQuorumStatus command completed successfully.
Ending at: 2015-05-28 10:39:22.909

```

The quorum status is enabled (TRUE) for all the catalogs.

- ___ 5. Show the primary catalog by typing this command.

```
xscmd -c showPrimaryCatalogServer -cep localhost:2809
```

```
C:\IBM\ODMInsights871\runtime\wlp\bin>xscmd -c showPrimaryCatalogServer -cep localhost:2809
Starting at: 2015-05-09 09:52:55.070
CWXSI0068I: Executing command: showPrimaryCatalogServer
Server          Host      Primary
-----
localhost-cisCatalog1 172.16.80.118 TRUE
localhost-cisCatalog2 172.16.80.118 FALSE
localhost-cisCatalog3 172.16.80.118 FALSE
CWXSI0040I: The showPrimaryCatalogServer command completed successfully.
Ending at: 2015-05-09 09:52:57.054
```

The “primary” status for cisCatalog1 server is set to TRUE to show that it is the master catalog server.

Section 2. Using the server administration scripts

In this section, you run the `serverManager` and the `propertyManager` scripts to manage server status and properties.

- ___ 1. Make sure that you are on `odmHost1`.
- ___ 2. Open a command prompt window, and change to the `C:\IBM\ODMInsights871\runtime\ia\bin` directory.

```
cd C:\IBM\ODMInsights871\runtime\ia\bin
```
- ___ 3. Run the `serverManager` to check that your container servers are online.
 - To check the `cisContainer1` is running, type:
`serverManager isonline --propertiesFile=../etc/connectionC1.properties`
 - To check the `cisContainer2` is running, type:
`serverManager isonline --propertiesFile=../etc/connectionC2.properties`
 - To check the `cisContainer3` is running, type:
`serverManager isonline --propertiesFile=../etc/connectionC3.properties`



Hint

You can copy and paste the commands for this exercise from the `dsi.txt` file that is in the **C:\labfiles\code** folder.

- ___ 4. Run the `propertyManager` to list which properties you can manage with this script.
 You can use the `connectionC1.properties` file to manage the `cisContainer1` server on `containerHost1`.

```
propertyManager list --propertiesFile=../etc/connectionC1.properties
```
- ___ 5. Run the `propertyManager` script to get the current `solutionAutoStart` value for `cisContainer1`.

```
propertyManager get solutionAutoStart  
--propertiesFile=../etc/connectionC1.properties
```

 The `propertyManager` returns the value of `solutionAutoStart` as `false`.
- ___ 6. Set the `solutionAutoStart` property to `true` and the `LogSuppressionThreshold` property to `2`.

```
propertyManager set solutionAutoStart="true" LogSuppressionThreshold="2"  
--propertiesFile=../etc/connectionC1.properties
```

 After you run this command, you see “Set property successful” messages with the property names, old values, and new values.

- ___ 7. Verify that the setting was changed in the `server.xml` file for `cisContainer1`.
- ___ a. Switch to the `containerHost1` host.
- ___ b. In Windows Explorer, open the `server.xml` file in the
`C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer1` directory.
- ___ c. Locate the `<ia runtime>` entry and note that the entry includes:
`logSuppressionThreshold="2"`

Section 3. Creating a trace file

In this section, you review the logging properties in the `server.xml` file of the container servers. To edit these properties, you modify the `server.xml` file on each of the containers, and on the inbound and outbound servers.

3.1. Modifying the containers, inbound and outbound servers

- ___ 1. Make sure that you are on containerHost1.
 - ___ 2. Create a trace file and increase the logging values for the server.
 - ___ a. In Windows Explorer, go to the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers\cisContainer1` directory.
 - ___ b. Expand the **cisContainer1** folder, and make a backup of the `server.xml` file. (For example, you can copy and paste the file in the **cisContainer1** folder, and it is automatically renamed as "Copy".)
 - ___ c. Open the `server.xml` file with Notepad++.
 - ___ d. In the `server.xml` file, locate the logging entry and notice the property values:
- ```
<logging maxFiles="5"
traceSpecification="com.ibm.ia.*=info:com.ibm.rules.*=info:*=info"/>
```



#### Information

You can add or modify existing entries to the following values to get extensive trace of the solution.

For example, if you want to receive more messages, you can increase the `maxFiles` property to: `maxFiles=10`

You can also change the `traceSpecification` property to get more detailed log results for specific applications. For example, you can change `*=info` to `*=warning`.

- \_\_\_ e. Replace the logging entry with the following values:

```
<logging
traceSpecification="com.ibm.rules.generated.dataie.banking_scenari.*=detail:com
.ibm.ia.*=warning:
com.ibm.ia.runtime.SolutionProviderMgr=finest:com.ibm.rules.*=info:*=warning"
maxFiles="10" messageFileName="bankingSolutionMessags.log" />
```



#### Hint

You can copy and paste the commands for this exercise from the `dsi.txt` file that is in the `C:\labfiles\code` folder.

- \_\_\_ f. Save the `server.xml` file and close it.
- \_\_\_ 3. Switch to `containerHost2` and repeat Step 2 for the `cisContainer2`.
- \_\_\_ 4. Switch to `containerHost3` and repeat Step 2 for the `cisContainer3`.
- \_\_\_ 5. Switch to your main host (`odmHost1`) and repeat Step 2 for the `cisInbound1` and `cisOutbound1` servers.

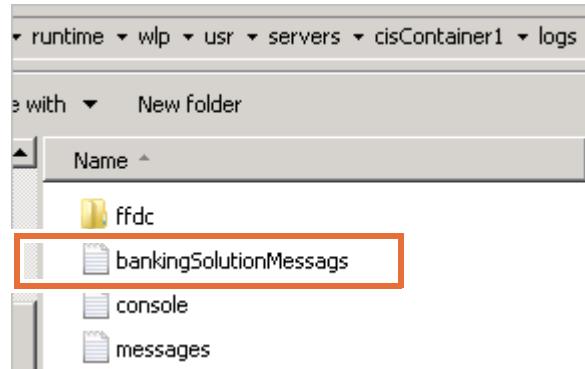


### Important

You do not need to restart the servers. The changes are detected and applied automatically.

- \_\_\_ 6. Look for the new `bankingSolutionMessages` trace file.
  - \_\_\_ a. Open the `C:\IBM\ODMInsights871\runtime\wlp\usr\servers` directory, and expand the **logs** folder for one of the servers that you modified.

For example, open the **cisInbound1\logs** folder on `odmHost1` to see the new `bankingSolutionMessages` file.



### Troubleshooting

If you do not see the `bankingSolutionMessages` file immediately, wait a few minutes and refresh the directory. Or, switch to the **logs** folder of another server. Sometimes, the file takes a few minutes to be generated.

- \_\_\_ b. Open the new `bankingSolutionMessages` file (in any text editor) to view the contents.  
The `bankingSolutionMessages.log` file contains all messages that are written or captured by the product. This file is created only if you enable additional traces.
- \_\_\_ c. Close the file when you are done.

## End of exercise

## Exercise review and wrap-up

In this exercise, you used administration tools to manage the servers and logging properties on multiple hosts.



# Appendix A. Changing host names and mapped drives

## A.1. Renaming hosts

- 1. On the desktop, right-click the **Computer** icon and click **Properties**.



- 2. In the **Computer name, domain, and workgroup settings** section, click **Change settings**.

System

|                         |                                                     |                      |
|-------------------------|-----------------------------------------------------|----------------------|
| Processor:              | Intel(R) Xeon(R) CPU<br>GHz (2 processors)          | X7350 @ 2.93GHz 2.93 |
| Installed memory (RAM): | 16.0 GB                                             |                      |
| System type:            | 64-bit Operating System                             |                      |
| Pen and Touch:          | No Pen or Touch Input is available for this Display |                      |

Computer name, domain, and workgroup settings

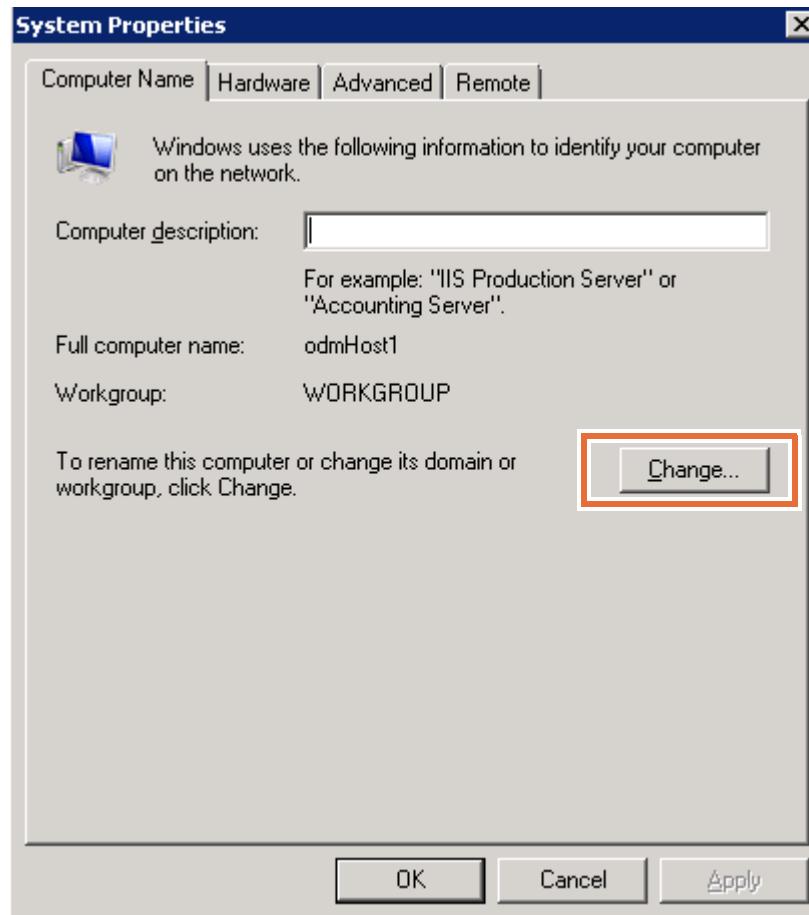
|                       |           |
|-----------------------|-----------|
| Computer name:        | admHost1  |
| Full computer name:   | admHost1  |
| Computer description: |           |
| Workgroup:            | WORKGROUP |

**See also**

[Action Center](#)  
[Windows Update](#)

 [Change settings](#)

3. In the System Properties dialog box, on the Computer Name page, click **Change** and click **OK**.



- \_\_\_ 4. In the **Computer name** field, type a unique name for your host and click **OK**.



- \_\_\_ 5. Accept the warnings about restarting and close the System Properties windows.  
 \_\_\_ 6. When prompted to restart the workstation, click **Restart Now** and wait for your workstation to restart before proceeding.



#### Note

You use this method if you also need to rename your container hosts.

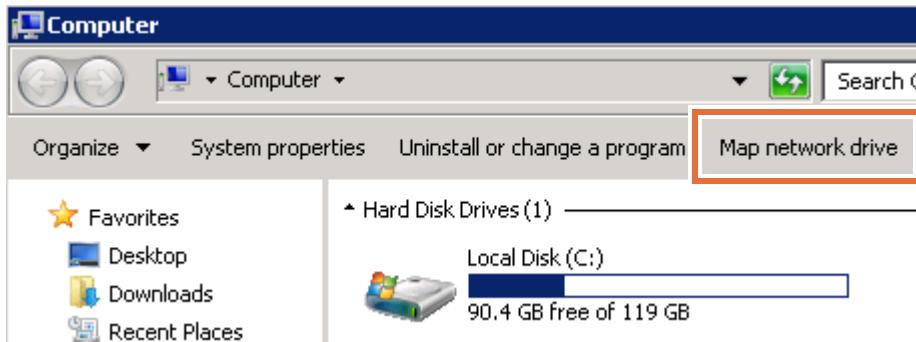
## A.2. Mapped drives

If you rename your main host, you must also create a mapped drive on each of the container hosts.

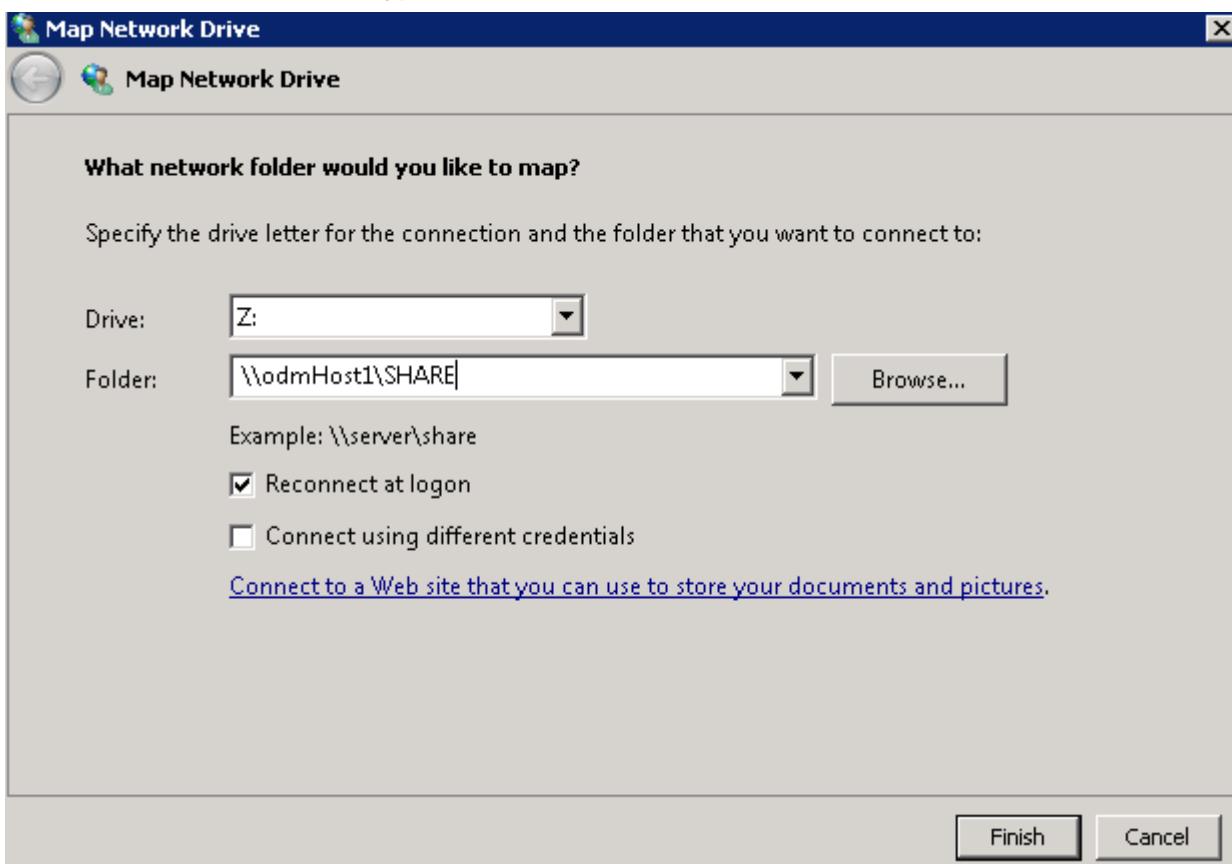
#### To map each container host to the shared drive:

- \_\_\_ 1. Go to containerHost1 (or the name of your “container 1” host).  
 \_\_\_ a. On the desktop of this host, double-click **Computer**.

- \_\_ b. Click **Map network drive**.



- \_\_ c. In the **Drive** field, you can choose a drive or keep the default drive.  
\_\_ d. In the **Folder** field, type: \\odmHost1\SHARE



- \_\_ e. Click **Finish** and close Windows Explorer.  
2. Go to containerHost2 (or the name of your “container 2” host).  
3. Go to containerHost3 (or the name of your “container 3” host).

## Appendix B. Host names and IP addresses

Write the host names and IP addresses that are assigned to the virtual machines in your environment.

|                                                                                                                                  |                         |                                                                                                                                  |                         |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Main host</b><br><br><i>Default host name:</i> <i>odmHost1</i><br><br>Assigned host name: _____<br><br>IP: _____              | Dual core<br>16 GB RAM  | <b>Container 1 host</b><br><br><i>Default host name:</i> <i>containerHost1</i><br><br>Assigned host name: _____<br><br>IP: _____ | Single core<br>8 GB RAM |
| <b>Container 2 host</b><br><br><i>Default host name:</i> <i>containerHost2</i><br><br>Assigned host name: _____<br><br>IP: _____ | Single core<br>8 GB RAM | <b>Container 3 host</b><br><br><i>Default host name:</i> <i>containerHost3</i><br><br>Assigned host name: _____<br><br>IP: _____ | Single core<br>8 GB RAM |

When host names are specified in the exercise steps, make sure that you use the actual host name that you noted here.





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