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Oracle Role Manager Installation Guide explains how to prepare for, install, upgrade, and configure Oracle Role Manager (Role Manager). It provides specific instructions for the operating system and Oracle software technology components that Role Manager requires.

**Audience**

This document is intended for Oracle database administrators (DBAs) and system administrators, and those who are involved in the installation of Oracle Role Manager and its related components.

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Related Documents

For more information, refer to the following documents:

- Oracle Role Manager Release Notes
- Oracle Role Manager Administrator’s Guide
- Oracle Role Manager User’s Guide
- Oracle Role Manager Developer’s Guide
- Oracle Role Manager Java API Reference
- Oracle Role Manager Integration Guide

Conventions

The following text conventions are used in this document:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>boldface</td>
<td>Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.</td>
</tr>
<tr>
<td>italic</td>
<td>Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.</td>
</tr>
<tr>
<td>monospace</td>
<td>Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.</td>
</tr>
</tbody>
</table>
Overview of Oracle Role Manager Installation

Oracle Role Manager (Role Manager) is an enterprise-class application for managing business and organizational relationships, roles and entitlements. An application for role lifecycle management and an authoritative repository for roles across the IT infrastructure, it drives automation of role-based provisioning and access control. Role Manager is a component of Oracle's Identity Management and Oracle Fusion Middleware.

This chapter provides an overview of the Role Manager installation process. This chapter includes the following sections:

- Role Manager Installation Methods
- Role Manager Installation
- Installation Considerations
- About the Single Sign-On Configuration with Oracle Role Manager

1.1 Role Manager Installation Methods

You can choose different installation methods to install Role Manager, as follows:

- Interactive Installation Methods
- Silent Installations

1.1.1 Interactive Installation Methods

When you use the interactive method to install Role Manager, Oracle Universal Installer displays a series of screens that enable you to specify all of the required information to install the Role Manager software.

1.1.2 Silent Installations

This installation method is for experienced users. If you are installing Role Manager for the first time, it is recommended that you run the Oracle Universal Installer using the interactive installation method as described in "Installing Oracle Role Manager" on page 3-1.

Role Manager provides a response file template for installation (orm.rsp). The response template file can be found in the <ORM_installation-Media>Disk1/stage/Response directory on the Role Manager installation media.
When you start Oracle Universal Installer and specify a response file, you can automate all of the Role Manager installation. These automated installation methods are useful if you need to perform multiple installations on similarly configured systems.

Oracle Universal Installer runs in silent mode if you use a response file that specifies all required information. None of the Oracle Universal Installer screens are displayed, and the logs are created under the oraInventory location, similar to interactive mode installation.

Prepare the response file by entering values for all parameters that are missing, and then save the file. Do not edit any values in the second part of either response file.

See "Performing a Silent Installation Using a Response File" on page 3-7 for information about performing an Role Manager silent installation.

1.2 Role Manager Installation

The Role Manager installation consists of two options:

- Install Software Only—This option provides the opportunity to copy the software onto the file system and then later load the data model after customizations are put into place. This is normally done after being familiar with the product in its standard form and having identified all of the modeling changes for your business needs.

- Install Software and Configure—This is the recommended way to install Oracle Manager. This option requires that two empty database schema/users are already created, and requires connectivity to database to load the data model for a standard installation.

After you check the requirements described in "Installation Considerations" on page 1-2, the general steps to install Role Manager include these tasks:

1. Run Oracle Universal Installer to perform Role Manager installation and then upgrade the existing configuration.

2. Configure your application server with Role Manager.

3. Load the sample data for Role Manager.

1.3 Installation Considerations

This section contains information that you should consider before deciding how to install this product. It includes the following topics:

- Hardware and Software Considerations
- Multiple Oracle Homes

1.3.1 Hardware and Software Considerations

The platform-specific hardware and software requirements included in this installation guide were current at the time this guide was published. However, because new platforms and operating system versions might be certified after this guide is published, review the certification matrix on the OracleMetaLink Web site for the most up-to-date list of certified hardware platforms and operating system versions. For example, the OracleMetaLink Web site is available at:

http://metalink.oracle.com
If you do not have a current Oracle Support Services contract, then for example, you can access the same information at:

http://www.oracle.com/technology/support/metalink/content.html

Refer to the Oracle Role Manager Release Notes for detailed system requirements and supported platforms.

1.3.2 Multiple Oracle Homes

This product supports multiple Oracle homes. You can install this release of the software more than once on the same system, in different Oracle home directories.

1.4 About the Single Sign-On Configuration with Oracle Role Manager

The configuration of Oracle Access Manager with Oracle Role Manager provides a secure web-based infrastructure for role management for all customer applications and processes. Oracle Access Manager integrates identity and access management across Oracle Role Manager, enterprise resources, and other domains deployed on eBusiness networks. Oracle Access Manager provides the foundation for managing the identities of customers, partners, and employees across internet applications. These user identities are combined with security policies for protected web interaction.

For more information about Oracle Role Manager single sign-on, refer to Oracle Role Manager Administrator’s Guide.
This chapter describes Oracle Role Manager (Role Manager) installation requirements. This chapter includes the following sections:

- Host Requirements for Role Manager Components
- Planning Your Installation

2.1 Host Requirements for Role Manager Components

You must obtain enterprise versions of application server software and database software complete with valid licenses. Role Manager does not include the application server or database software.

The Role Manager installation program may conflict with other installed applications, utilities, or drivers. Try to remove all non-essential software and drivers from the installation computer before loading Role Manager.

**Important:** Always check the *Oracle Role Manager Release Notes* for the requirements and supported configurations specific to each version. The information in this guide applies to the Oracle Role Manager 10.1.x versions.

2.1.1 Role Manager Application Server Host Requirements

Refer to the *Oracle Role Manager Release Notes* for the specific application server host requirements.

2.1.2 Database Server Host Requirements

Refer to the Oracle Database documentation for the specific database host requirements.

2.2 Planning Your Installation

Before installing Role Manager, you must read "Host Requirements for Role Manager Components" on page 2-1 and "Installation Worksheet" on page 2-2 to help plan your installation.
Because the Database Administrator (DBA), System Administrator, and IT Developer typically handle tasks specific to their specific areas of expertise, you should share Role Manager installation information among your team members.

### 2.2.1 Installation Worksheet

The Installation Worksheet table helps you identify configuration attributes you need before starting the Role Manager installation. Print this worksheet and use it to take notes as you go through your installation. Use the User Selection column to fill in information specific to your installation:

<table>
<thead>
<tr>
<th>Item</th>
<th>User Selection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base directory for installing Role Manager.</td>
<td></td>
</tr>
<tr>
<td>Name or IP address of the computer where the Role Manager database is installed.</td>
<td></td>
</tr>
<tr>
<td>TCP listener port number for the database.</td>
<td></td>
</tr>
<tr>
<td>Service name of the database for your installation.</td>
<td></td>
</tr>
<tr>
<td>User name and password of the <code>SYSTEM</code> user account for access to the database.</td>
<td></td>
</tr>
<tr>
<td>Name or IP address of the application server computer.</td>
<td></td>
</tr>
<tr>
<td>TCP listener port number for the application server.</td>
<td></td>
</tr>
</tbody>
</table>
This chapter includes the major steps required to install Oracle Role Manager (Role Manager).

This chapter includes the following sections:

- Before You Start
- Database Setup
- Installing Role Manager
- Performing a Silent Installation Using a Response File
- Troubleshooting Configuration Assistant

### 3.1 Before You Start

Before you begin the Role Manager installation, you must create a Role Manager database user (owner) and Role Manager application user.

Before performing the procedures in this chapter, ensure the following:

- The installation computer has network access to the database server host.
- You have the necessary information from the Installation Worksheet on page 2-2.
- For UNIX-based systems—It is recommended that you create a special user account, such as `orm`, and set its home directory to the directory you plan to use for installation. You may want to have all dependent applications (such as JBoss and WebSphere) participate in the same group.

### 3.2 Database Setup

Before installing Role Manager, you need to create the database owner and application user schemas on the database used for Role Manager. Database owner is the user with permissions to change the schema, but the application user does not have permissions to change the schema. It is recommended that you use the scripts provided on the installation media following the procedures in this section. These steps, described in this section, are normally performed by a database administrator on the Oracle database host.

Before continuing, ensure that you have met the following requirements:

- The Oracle service and TNSListener are running.
- You have the Oracle `SYSTEM` account user name and password.
- You have the Oracle service name (instance).
Optional: You have OS-level permission to edit the init.ora file to configure the Oracle rollback segments created as part of the Role Manager installation.

3.2.1 Creating the Role Manager Tablespaces

Before the Role Manager data model can be deployed, either by the Role Manager installer or manually at the command line, the tablespaces for Role Manager must exist.

Your policies may require that the scripts referenced in this section be run directly on the Oracle database server by a database administrator.

The provided tablespace creation script needs to be modified if your organization requires different extent and growth options. If you instead prefer to use your own tablespace creation script, the Role Manager user creation scripts expect three tablespaces, one for DATA pages named ORM_DATA, one for INDEX pages named ORM_INDEX, and one for TEMP space.

Data, Index, and Temporary Tablespaces

Data pages are files that are contained by each tablespace in an Oracle database. A data file can be associated with only one tablespace and only one database. Before you can create a tablespace, you must create a database to contain it. The primary tablespace in any database is the SYSTEM tablespace. The SYSTEM tablespace always contains the data dictionary tables for the entire database.

Index pages are either stored in the user’s default tablespace or in the tablespace specified in the CREATE INDEX statement.

Temporary table space is used for temporary storage of data. A temporary tablespace can be assigned to users with CREATE USER or ALTER USER statement and can be shared by multiple users.

The directory path to locate data, index, and temporary tablespaces is $ORACLE_DB_HOME/oradata/$ORACLE_SID/

For example:
C:\oracle\product\10.1.4\oradata\orcl\

For more information about table spaces, visit the Oracle Web site at
http://download.oracle.com/docs/cd/B19306_01/server.102/b14231/tables.htm#sth

To create the Role Manager tablespaces:

1. From the installation media, copy the create-tablespace.sql script from the samples/sqlscripts/oracle directory to a temporary location.

2. Optionally, in the create-tablespace.sql file, edit the path to the log directory you want to use to save messages created by this script. For example:
   
   set echo on;
   spool <new_log_path>/create-tablespace.log

3. Optionally, in the same file, modify the tablespace definitions to meet your specific configuration requirements.
4. Using sqlplus or a similar utility, run the create-tablespace.sql script to create the tablespaces for Role Manager database table data, index, temporary data, and rollback segments. For example:

    sqlplus system/<system_pw><db_service> create-tablespace <data_dir>/ORM_DATA <index_dir>/ORM_INDEX <temp_dir>/ORM_TEMP <undo_dir>/ORM_UNDO

**Note:** The data and index table spaces must be named ORM_DATA and ORM_INDEX respectively.

5. Review the contents of the create-tablespace.log file to verify there were no error messages.
   If there are errors, ensure that the Oracle database paths you specified in the command are valid.

6. Optionally, configure rollback segments.
   Rollback segments are used to save data in transactions before data is committed to the database. To bring the rollback segments online automatically every time the Oracle instance is restarted, you must update the init.ora file by adding the following line:

   `ROLLBACK_SEGMENTS = (ORM_1, ORM_2, ORM_3, ORM_4)`

### 3.2.2 Creating the Role Manager Users

Before creating the Role Manager users, ensure that the tablespaces used for Role Manager have been created.

**To create the Role Manager database users:**

1. From the installation media, copy the following scripts from the samples/sqlscripts/oracle directory to a temporary location:

   - `create-app-user.sql`
   - `create-schema-owner.sql`

2. As the Oracle SYSTEM user, using sqlplus or a similar utility, create the Role Manager database owner by running the `create-schema-owner.sql` script as follows:

   ```sql
   sqlplus system/[system_pw][db_service] create-schema-owner [owner_username]
   ```

   Enter the password at the prompt and make note of username and password values, because you need them when running the Role Manager installer.
   If you have changed tablespace names, ensure to update `create-schema-owner.sql` to use the same names as those defined in the `create-tablespace.sql` file.
3. Create the application user for Role Manager by running the create-app-user.sql script as follows:

```sql
sqlplus system/[system_pw][db_service] create-app-user [app_username]
```

Enter the password at the prompt and make note of username and password values, because you need them when running the Role Manager installer. If you have changed tablespace names, ensure to update create-app-user.sql to use the same names as those defined in the create-tablespace.sql file.

Role Manager uses two schema/users, one as the owner and the other as the user of the application. This is done for security reasons, ensuring that schema changes can be made only by the owner. As part of the configuration process, the installer creates all of the synonyms required so that the Role Manager application user can invoke data changes.

### 3.3 Installing Role Manager

In this part of the installation, you launch the installer and configure Role Manager with your environment.

**To perform the Role Manager installation:**

1. Ensure that the drive or directory containing the Role Manager installation media is accessible from the installation computer.

2. Run Oracle Universal Installer (OUI) to install Role Manager.
   
   **For Windows:**
   
   - Locate the directory containing the Role Manager installation files for Windows.
   - Double-click `setup.exe`.

   **For UNIX:**
   
   - Change directory to the location containing the Role Manager installation files for your operating system.
   - As the software owner account that owns the current `ORACLE_HOME` environment, start the installer with the following command:
     
     ```bash
     ./runInstaller.sh
     ```

**Note:** If you do not know the account to use, contact your system administrator or DBA for information specific to your environment.

3. On the Welcome page, click **Next**.

4. On the Specify File Location page:
   
   a. Ensure that the source path is pointing to the Role Manager installation media, for example:

   ```bash
   C:\stage\products.xml
   ```
b. If you already have any oracle products on the installation computer, type a new unique identifier that Oracle can use for inventory purposes, such as orm.

c. Change the destination path to the location on the file system where you want to install the Role Manager software.

---

**Note:** The destination must be an empty directory. The installer creates the directory you specify if it does not already exist.

---

5. Choose one of the following installation options, then click **Next** to continue.

- **Install Software and Configure**
  This option installs the Role Manager software and then configures the database with the primordial data model. It also provides additional options to include the standard data model used by the Role Manager UI. If you do not yet have a customized data model, select this option.

- **Install Software Only**
  This option copies the Role Manager files to the specified installation location. It does not load any configuration or deploy the models required to use the Role Manager UI. This option is intended for manual deployments of customized models. Choosing this selection skips to the Summary page of the installer. For information about deploying the customized data model, refer to "Manual Data Model Deployment" on page 7-2.

6. Select the configuration options you want, then click **Next** to continue.

- **Primordial Data Model**
  The core model used by the Role Manager system components.

- **Standard Data Model**
  This is required to load the standard configurations to Oracle Role Manager system.

7. Set the database connection values in the **Database Connect String** as follows:

   a. For a single database host instance, provide the connection string as follows:
      
      `<Database-server host name>:<database server port number>:<Database service name>`

   b. For a real application cluster (RAC) database instance, provide the connection string as follows:
      
      `<Database-server instance1 host name>:<database server instance1 port number>^<Databaseserver instance2 host name>:<database server instance2 port number>@<Database service name>`
      
      For example:
      
      `host1-vip:1521^host2-vip:1522@db-service`

8. Set the values needed to configure the Role Manager database tables as described below.

   a. In the **Database Owner** field, type the name to use for the Role Manager owner schema/user.
b. In the **Database Owner Password** field, type the password to use for the Role Manager owner schema/user.

c. In the **Application User** field, type the name to use for the Role Manager application user schema.

d. In the **Application User Password** field, type the password to use for the Role Manager application user schema.

e. Click **Next** to continue.

9. Create the administrative account for Role Manager as follows:

a. Type a name to use as the Role Manager Administrator user ID.

b. Type a password for the Role Manager Administrator.

c. Retype the password in the Confirm Password field, then click **Next** to continue.

Oracle Universal Installer checks the system to verify that it is configured correctly to run Oracle software. If you have completed all of the preinstallation steps in this guide, all of the checks should pass.

If a check fails, then review the cause of the failure listed for that check on the screen. If possible, rectify the problem and rerun the check. Alternatively, if you are satisfied that your system meets the requirements, then you can select the check box for the failed check to manually verify the requirement.

10. On the installation Summary page, review the installation summary information. After reviewing this installation information, click **Install** to begin the installation procedure.

11. If you encounter problems during installation, then examine the Oracle Universal Installer actions recorded in the installation log file. The log file can be found in the cfgtoollogs/oui directory, in the following location:

For Windows:

%SYSTEMDRIVE%\Program Files\Oracle\Inventory\oraInventory

For UNIX:

If your computer already has the oralInst.loc file at the "/etc" location, then oraInventory is created at that location. This is depicted in the following example:

cat /etc/oraInst.loc
inventory_loc=/home/spatra/oraInventory123

If your computer is not having the oralInst.loc file at the "/etc" location, then oraInventory is created by default at $HOME/oraInventory, where $HOME is the user home.

**Note:** When runInstaller.sh (linux or aix) or setup.exe (windows) is executed, it displays the log location.

12. After the installation completes, click **Exit**, then click **Yes** to confirm.
Performing a Silent Installation Using a Response File

Follow these brief steps to perform a silent installation using a response file:

1. Ensure that all prerequisites are met for the installation of Role Manager.

2. Prepare the Role Manager response file. A template response file can be found with the Role Manager installation media at stage/Response/orm.rsp. Alternatively, you can run the installer in a record mode to save your inputs to a file, which you can use later as a response file. Use the following command to run the installer in a record mode:

   `setup.exe -record -destinationFile newResponseFile`

The version of the response file used is 2.2.1.0. Prepare the response file by entering values in the file for all parameters, then save the file. Table 3–1 describes the parameters of the response file with its sample values.

Table 3–1 Parameters of the Response File

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIX_GROUP_NAME</td>
<td>Enter the UNIX group name to be set for the inventory directory. Note: This is valid only for UNIX platforms.</td>
<td>g533</td>
</tr>
<tr>
<td>FROM_LOCATION</td>
<td>Enter the source path to locate the installation media, products.xml file. This file is present in the location where setup.exe file is present.</td>
<td>C:\Softwares\build2\DALY\Disk1\stage\products.xml</td>
</tr>
<tr>
<td>ORACLE_HOME</td>
<td>Enter the valid path of the ORACLE_HOME.</td>
<td>C:\OHOME1</td>
</tr>
<tr>
<td>ORACLE_HOME_NAME</td>
<td>Enter the Oracle_Home_Name, where folders and services are created.</td>
<td>OHOME1</td>
</tr>
<tr>
<td>TOLEVEL_COMPONENT</td>
<td>This field holds the details of the top-level component to be installed in the current session. Note: You need not change the default value of this parameter.</td>
<td>(&quot;oracle.orm.top&quot;, &quot;10.1.4.0&quot;)</td>
</tr>
<tr>
<td>DEINSTALL_LIST</td>
<td>List of components to be de-installed. Note: You must enter a value for this parameter only if you are de-installing any component using response file.</td>
<td>oracle.orm.top</td>
</tr>
<tr>
<td>SELECTED_LANGUAGES</td>
<td>The language in which the components are installed. Note: You need not change the default value of this parameter.</td>
<td>en</td>
</tr>
<tr>
<td>INSTALL_TYPE</td>
<td>Installation type of the component. Note: You need not change the default value of this parameter.</td>
<td>Oracle Role Manager</td>
</tr>
</tbody>
</table>

Note: In case of installing and configuring Oracle Role Manager software, the users/schemas must already exist and name and password values must match what was used when they were created. Refer to "Creating the Role Manager Users" for information.
3. Invoke Oracle Universal Installer using the following options:

For UNIX:

```
./runInstaller.sh -silent -responseFile <path_to_rsp>
```

For Windows:

```
setup.exe -silent -responseFile <path_to_rsp>
```

In this example:

- `<path_to_rsp>` identifies the full path of the response file.
- `-silent` runs Oracle Universal Installer in silent mode and suppresses the Welcome window.

For general information about these options and about how to complete an installation using these response files, see the platform specific Oracle Database installation guides and Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide for Linux and "Installing Oracle Products" in Oracle Universal Installer and OPatch User’s Guide for more information about installing and using response files.

**Note:** In case of installing and configuring Oracle Role Manager software, the users/schemas must already exist and name and password values must match what was used when they were created. Refer to "Creating the Role Manager Users" for information.

### 3.5 Troubleshooting Configuration Assistant

If Oracle Role Manager configuration assistant failure occurs when running configuration assistant execution commands on the command line, then re-run the configuration assistant execution command. The configToolCommands file will be

**Table 3–1 (Cont.) Parameters of the Response File**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Sample Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>szl_RepositoryUserInput</td>
<td>Enter the repository details of the user.</td>
<td>&quot;DB-USERNAME&quot; &quot;DB-PASSWORD&quot;</td>
</tr>
<tr>
<td>szl_ORMAdminInput</td>
<td>Enter the details of Oracle Role Manager Administrator.</td>
<td>&quot;ADMIN-USERNAME&quot; &quot;ADMIN-PASSWORD&quot;</td>
</tr>
<tr>
<td>StartupProcesses</td>
<td>Indicates the following configuration options:</td>
<td>Primordial Data Model Configuration</td>
</tr>
<tr>
<td></td>
<td>■ Primordial Data Model - The core model used by the Role Manager system components.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Standard Data Model - to load the standard configurations to Oracle Role Manager system.</td>
<td></td>
</tr>
<tr>
<td>Note:</td>
<td>You need not change the default value of this parameter.</td>
<td></td>
</tr>
<tr>
<td>n_Install Type</td>
<td>Enter a valid number to indicate the installation type. You must enter &quot;0&quot; for Install and Configure and &quot;1&quot; for Install Only option.</td>
<td>0</td>
</tr>
</tbody>
</table>
generated under ORM_HOME/cfgtoollogs directory. You can use this generated script file to execute the failed configuration assistant.
This chapter includes the steps required to configure the application server to run the Oracle Role Manager (Role Manager) server and Web application.

This chapter includes the following sections:

- **Before You Configure the Application Server**
- **Configuring Oracle WebLogic Server in a Nonclustered Mode**
- **Configuring Oracle WebLogic Server in a Clustered Mode**

### 4.1 Before You Configure the Application Server

Role Manager is intended to be deployed on only one server platform per installation. The server platform can be one of the following:

- Oracle WebLogic Server
- JBoss
- IBM WebSphere

The procedures in this chapter assume the following:

- The application server system has network access to the database server host.
- The Role Manager software is accessible by the application server system.
- You know the application server's listener port and host name.
- If running on WebSphere, a server, cell, and node to use for Role Manager have been created and configured.

While configuring the application servers, you may require to modify the following files:

- **webui.war file** - This file is used for customizing Oracle Role Manager to the user's requirement.

  **Note:** For WebSphere application server, webui.ear file is used and not webui.war file.

- **orm-ds.xml file** - This file is used to configure the data source information. Refer Step 5 of the "Configuring JBoss Server in a Nonclustered Mode" on page 6-1 for information about how to modify the data source information in the orm-ds.xml file.
4.2 Configuring Oracle WebLogic Server in a Nonclustered Mode

You can configure the WebLogic server either manually or automatically, following an extension template. This section provides the information about automated configuration of WebLogic server. If you want to configure the WebLogic server manually, refer to Appendix A.

**Note:** Before you run the automated configuration of WebLogic server, ensure that the WebLogic server is installed and the node manager is up and running. You can start the node manager by running the `BEA_HOME/wlserver_10.3/server/bin/startNodeManager.sh` script for Linux.

`BEA_HOME/wlserver_10.3/server/bin/startNodeManager.cmd` script for Microsoft Windows.

You must configure WebLogic server in SSL mode to operate in a secure environment. For information about configuring SSL for WebLogic server, refer to the following URL:

http://e-docs.bea.com/wls/docs103/secmanage/ssl.html

This section includes the following topics:

- Configuring WebLogic Server Based On Template
- Setting Up Commons Logging
- Configuring Administrative Console
- Deploying Role Manager

### 4.2.1 Configuring WebLogic Server Based On Template

To perform the template based configuration of WebLogic server:

1. Run the configuration wizard in WebLogic server directory:
   
   `BEA_HOME/wlserver_10.3\common\bin\config.exe` or `config.sh`

2. When the configuration wizard is displayed, select **Create a new WebLogic Domain** and click **Next**.

3. Select **Base this domain on an existing template**, go to the following path and click **Next**:
   
   `ORM_HOME/weblogic/templates/10.3/orm_createdomain_template_103.jar`

4. In the Specify Domain Name and Location window, type domain name and click **Next**.

5. In the Configure Administrator Username and Password window, type **User Name** and **Password** and click **Next**.

6. Configure server start mode and JDK by performing the following steps:
   
   a. On the left side of the window, select **Production Mode**.
   
   b. On the right side of the window, select appropriate JDK and click **Next**.
7. In the Configure Data Sources window, for both the ORM Data Source and the ORM XA Data Source, type the DBMS details such as User Name, Password, DBMS/Service, Host, and Port and click Next.

**Note:** If you are using RAC database, provide the following string while creating the data source, by substituting the values for hostname, port, and service name of your instance:

```
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=host1-vip)(PORT=1521))(ADDRESS=(PROTOCOL=TCP)(HOST=host2-vip)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=orcl.us.oracle.com)))
```

8. In the Test JDBS Data Sources window, ensure that you click Test Connections to test the data connection for each datasource and then click Next.

9. In the Select Optional Configuration window, select all check boxes and click Next.

10. In the Configure Administration Server window, set the Listen Address to a value appropriate to your setup such as, LocalHost, IP Address, DNS equivalent and Listen Port and then click Next.

11. In the Configure Managed Servers window, set the Listen Address to a value appropriate to your setup such as, LocalHost, IP Address, DNS equivalent and Listen Port and then click Next.

12. In the Configure Clusters window, click Next.

13. In the Configure Machines window:
   - for UNIX machine, click the UNIX machine tab, the Oracle Role Manager machine name is auto populated. Click Next.
   - for Windows machine, click the UNIX machine tab and delete the existing Oracle Role Manager machine name, ormMachine. On the Machine tab, click Add and then type Oracle Role Manager machine name, ORM_Machine, Node manager listen address, and Node manager listen port, and then click Next.

14. In the Assign Servers to Machines window, ensure that ORMServer is listed under ormMachine on the right window and then click Next.

**Note:** For Microsoft window, select ORM_Machine on the right window.

15. In the Target Services to Clusters or Servers window, click Next.

16. In the Configure RDBMS Security Store Database window, click Next.

17. In the Configuration Summary window, verify the details and click Create. The domain is created and the following are configured automatically:
   a. Admin server is created.
   b. Oracle Role Manager Managed server, ORMServer is created.
   c. Non-XA Data Source, ORM Data Source is created.
   d. XA Data Source, ORM XA Data Source is created.
   e. JMS Server, ORM JMSServer is created.
f. JMS Module, ORM JMSModule is created.

g. Subdeployment, ORM JMSSubdeployment is created.

h. Topic, ORM NotificationTopic is created.

i. Queues, ORM FinisherQueue, ORM LoaderQueue, and ORM IncomingEventQueue are created.

j. Connection Factory such as ORM Connection Factory and Finalization ORM Connection Factory are created.

18. Click Done.

4.2.2 Setting Up Commons Logging

Set up the Commons Logging by performing the steps described in "Setting Up Commons Logging" on page A-4.

Note: Logging will take effect the next time WebLogic Administration server and Oracle Role Manager server are started.

4.2.3 Configuring Administrative Console

1. Start the server and log in to the WebLogic Administrative Console.

2. Set the JTA transaction timeout parameter by performing the following steps:
   a. In the domain tree, select Services, JTA.
   b. In the Timeout Seconds field, type 1200.
   c. In the Abandon Timeout Seconds field, ensure that the value is 86400.
   d. Click Save.

   Note: The value of Abandon Timeout Seconds must always be greater than Timeout Seconds and Stuck Thread Max Time.

3. Set the Stuck Thread Max Time parameter by performing the following steps:
   a. In the domain tree, select Environment, Servers, ORMServer.
   b. Click the Tuning tab.
   c. In the Stuck Thread Max Time field, type 3000.
   d. Click Save.

   Note: The value of Stuck Thread Max Time must be at least twice that of the value of Timeout Seconds.

4. Configure the JMS Connection Factory by performing the following steps:
   a. In the domain tree, select Services, Messaging, JMS Modules.
   b. Click ORM JMS Module.
   c. Click ORM ConnectionFactory.
   d. Ensure that the Default Targeting Enabled field is selected.
e. Click Save.

f. Click the Transactions tab, ensure that the XA Connection Factory Enabled field is selected and then click Save.

g. In the domain tree, select Services, Messaging, JMS Modules.

h. Click ORM JMS Module.

i. Click Finalization ORM ConnectionFactory.

j. Ensure that the Default Targeting Enabled field is selected.

k. Click Save.

l. Click the Transactions tab, ensure that the XA Connection Factory Enabled field is selected and then click Save.

5. Configure the Redelivery Limit by performing the following steps:

   a. In the domain tree, select Services, Messaging, JMS Modules.

   b. Click ORM JMS Module.

   c. Click ORM FinisherQueue.

   d. Click Delivery Failure.

   e. Set Redelivery Limit value to 3.

   f. Click Save.

   g. In the domain tree, select Services, Messaging, JMS Modules.

   h. Click ORM JMS Module.

   i. Click ORM IncomingEventQueue.

   j. Click Delivery Failure.

   k. Set Redelivery Limit value to 3.

   l. Click Save.

   m. In the domain tree, select Services, Messaging, JMS Modules.

   n. Click ORM JMS Module.

   o. Click ORM LoaderQueue.

   p. click Delivery Failure.

   q. set Redelivery Limit value to 3.

   r. Click Save.

6. In the domain tree, select Environment, Servers, ORM Server and navigate to the Control tab and click Start to start the managed server.

---

**Note:** You must start node manager before starting the managed server.

---
4.2.4 Deploying Role Manager

**Note:** Perform this procedure only if you are repeating the deployment of the same Role Manager server.

If this is your first installation, then skip this section and continue with "To deploy the Role Manager server application".

**To deploy Role Manager:**

1. Start up the Role Manager server that contains the JMS server.
2. Navigate to Services, Messaging, and JMS Modules.
3. Click ORM JMSModule.
4. From the resource list, select the ORMFinisherQueue.
5. On the Monitoring tab, select the ORM JMSModule! ORM Finisher Queue destination and click Show Messages.
6. Click Delete and from the list of options, select Delete All.
7. In the confirmation page, click Yes.

**To deploy the Role Manager server application:**

1. Select Deployments in the left part of the Administration Console window.
2. Click Install in the right part of the Administration Console window.
3. In the ORM_HOME, navigate to the server.ear file and select it. Click Next.

**Note:** The server.ear file can be accessed from the path ORM_HOME/lib/server.ear.

4. Select Install this deployment as an application. Click Next.
5. Select ORM Server as the target in the Target field. Click Next.
6. In the Name field, type the name of the Role Manager server application, for example, ORM ServerApp.
7. Click Next and in the Install Application Assistant page, click Finish.
8. Click Save to activate the changes.

**Note:** You must restart the ORMServer to login.

9. In the right part of the Administration Console window, under Deployments, check the State of ORM Server App. If it displays: Prepared, then select the checkbox next to the name of it. Click Start and from the list, select Servicing All Requests. When the status of the application is Active, you can log into the Oracle Role Manager Console.

10. To test the server installation, ensure that you can get to the Role Manager administrative console from a Web browser. For example:

    http://localhost:<port>/ormconsole
To deploy the Role Manager Web application:
1. Select Deployments in the left part of the Administration Console window.
2. Click Install in the right part of the Administration Console window.
3. Navigate to the webui.war file and select it. Click Next.
4. Select Install this deployment as an application. Click Next.
5. In the Target field, select ORMServer as the target and then click Next.
6. In the Name field, type the name of the Web user interface application.
7. Select Custom Roles and Policies: Use only roles and policies that are defined in the Administration Console from the Security list.
8. Click Next and then click Finish.
9. In the right part of the Administration Console window, under Deployments, check the State of Webui App. If it displays: Prepared, then select the checkbox next to the name of it. Click Start and from the list, select Servicing All Requests. When the status of the application is Active, you can log into the Oracle Role Manager Console.
10. Test the Web application installation as follows:
    a. In a Web browser, navigate to the Role Manager Web application address. For example:
       http://localhost:<port>/webui
    b. Log in as the Role Manager Administrator created in "Installing Role Manager" on page 3-4.

To start the server application and the Web application for WebLogic:
Starting the server application and the Web application are automatically taken care for WebLogic. If server is running in Production mode, then application will be in prepared state. To change it to active state, perform the following steps:
1. Click Deployments and select an application.
2. In the right part of the Administration Console window, under Deployments, check the State of ORM Server App. If it displays:
   - **Active**, then the application is started and you need not perform the following steps.
   - **Prepared**, then select the checkbox next to the name of it. Click **Start** and from the list, select **Servicing All Requests**. When the status of the application is Active, you can log into the Oracle Role Manager Console.

### 4.3 Configuring Oracle WebLogic Server in a Clustered Mode

This section explains how to deploy Oracle Role Manager in a clustered Oracle WebLogic Server environment.

This section discusses the following topics:

- **About Oracle WebLogic Server Clusters**
- **Configuring WebLogic Clusters**
- **Configuring Apache Failover Proxy**

#### 4.3.1 About Oracle WebLogic Server Clusters

A clustered installation requires multiple host computers. The instructions in this chapter involve deployment and running of Oracle Role Manager on three host computers. These instructions assume that you have three computers, of which one is used to host the Web server and the other two are used for Oracle Role Manager cluster.

Table 4–1 describes the entities needed for a cluster, the computers that the entities run on, and the software required for the entities. Host computers and entities are labeled.

<table>
<thead>
<tr>
<th>Host Computers</th>
<th>Entities</th>
<th>Software</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIMARY_NODE on ORM_Machine</td>
<td>WebLogic Admin Server, and WebLogic Node Manager</td>
<td>WebLogic Server</td>
<td>Administrative server for the WebLogic domain and WebLogic Node Manager</td>
</tr>
<tr>
<td>ORM_Finalization Server</td>
<td>Oracle Role Manager</td>
<td>ORM Finalization Server</td>
<td></td>
</tr>
<tr>
<td>ORM_SERVER1</td>
<td>Oracle Role Manager</td>
<td>WebLogic Managed Server, part of ORM_CLUSTER</td>
<td></td>
</tr>
<tr>
<td>ORM_CLUSTER</td>
<td>Oracle Role Manager</td>
<td>Name of the WebLogic cluster that hosts Oracle Role Manager (logical entity).</td>
<td></td>
</tr>
<tr>
<td>SECONDARY_NODE on ORM_Machine1</td>
<td>WebLogic Node Manager</td>
<td>WebLogic Server</td>
<td>WebLogic Node Manager</td>
</tr>
<tr>
<td>ORM_SERVER2</td>
<td>Oracle Role Manager</td>
<td>WebLogic Managed Server 2, part of ORM_CLUSTER</td>
<td></td>
</tr>
<tr>
<td>ORM_CLUSTER</td>
<td>Name of the WebLogic cluster that hosts Oracle Role Manager (logical entity).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>THIRD_NODE on ORM_Machine2</td>
<td>Apache Web Server</td>
<td>Apache HTTP Server 2.2 with WebLogic 10.3 Apache plugin</td>
<td>Apache Failover Proxy</td>
</tr>
</tbody>
</table>
4.3.2 Configuring WebLogic Clusters

The instructions mentioned in this section are for installing Role Manager in a WebLogic cluster of two machines with two Role Manager servers, one Admin Server and one finalization server. Therefore there are four servers, the PRIMARY_NODE on first machine (ORM_Machine) hosts Admin, Finalization, and Managed Server1 and the SECONDARY_NODE on second machine (ORM_Machine1) hosts Managed Server2. In addition, the data store for the queues are database-based and not file-based.

4.3.2.1 Configuring WebLogic Server in a Clustered Mode

To configure WebLogic server in a clustered mode:

1. On the primary node, complete the single instance of WebLogic server configuration, install and deploy Role Manager, load sample data, and ensure that the server is running. Refer to "Configuring WebLogic Server Based On Template" on page 4-2 for instructions on configuring the WebLogic server.

   The following are the configuration details for the primary node:
   
   Host: PRIMARY_NODE
   Machine: ORM_Machine
   BEA_Home: BEA_HOME
   WLS_HOME: WLS_HOME
   DOMAIN_HOME: DOMAIN_HOME
   ADMIN_PORT: ADMIN_PORT
   ORM server: ORMServer
   ORM server Port: ORMServer_Port (9001)
   Node_manager Port: NODE_MANAGER_PORT (5556, ssl)

   To control your Managed Servers remotely from the Administrative Server, you must set up and configure Node Manager on each of the remote systems hosting Managed Servers by following the instructions on the BEA e-docs page:
   http://e-docs.bea.com/wls/docs103/nodemgr/nodemgr_config.html

   The default location of the nodemanager.properties file is:
   BEA_HOME/wls/wlserver_10.3/common/nodemanager

2. Install WebLogic on a secondary node.

3. Start the node manager on both the nodes and start the administrative server on primary node if it is not running.

Caution: Deploying an application in a clustered installation is a complex procedure. This document assumes that you have expertise in installing and running applications on an Oracle WebLogic Server cluster. This chapter provides Oracle Role Manager-specific information only. It does not cover the procedure to set up an Oracle WebLogic Server cluster. For more information about clustering, refer to Oracle WebLogic Server documentation.
4. Log in to the administrative server console on the primary node. For example: http://primarynode:7001/console.

5. Shutdown ORMServer on the primary node as follows:
   a. In the domain tree, select Environment, Servers.
   b. Click the Control tab.
   c. Select ORM Server and then click Shutdown.

6. Create a Machine, for example, ORM_Machine1 for the secondary node as follows:
   a. In the domain tree, select Environment, Machines.
   b. Click New.
   c. In the Name field, type ORM_Machine1.
   d. Click OK.

7. Configure the machine to access Node Manager on secondary machine as follows:
   a. In the domain tree, select Environment, Machines.
   b. Click on the machine that you created, for example, ORM_Machine1.
   c. Click the Node Manager tab.
   d. In the Listen Address field, type the IP address of the secondary node and click Save.

8. Create a server, for example, ORMServer1 which uses the port, for example, ORMServer_Port1(7071) as follows:
   a. In the domain tree, select Environment, Servers.
   b. Click New.
   c. In the Server Name field, type ORMServer1.
   d. In the Server Listen Port field, type 7071.
   e. Click Finish.

9. Ensure that ORMServer1 is assigned to ORM_Machine1 as follows:
   a. In the domain tree, select Environment, Machines, ORM_Machine1, Node Manager.
   b. Check whether the IP address is same as the secondary node.
   c. Click the Servers tab and select Add.
   d. Choose Select an existing server, and associate it with this machine and from the Select a server list, select ORMServer1.
   e. Click Finish.

The following are the configuration details of the secondary node:

- Host: SECONDARY_NODE
- Machine: ORM_Machine1
- BEA_Home: BEA_HOME1

Note: For UNIX flavors, in the Machine OS field, select UNIX.
WLS_HOME: WLS_HOME1
DOMAIN_HOME: No domain yet
ADMIN_PORT: No admin server on secondary node
ORM server: ORMServer1
ORM server Port: ORMServer_Port1 (7071)
Node_manager Port: NODE_MANAGER_PORT1 (5556, ssl)

10. Create cluster as follows:
   a. In the domain tree, select Environment, Clusters.
   b. Click New.
   c. In the Name field, type ORMCluster.
   d. In the Messaging Mode list, select Multicast.
   e. Click OK.
   f. Click ORMCluster.
   g. Click Servers tab.
   h. Click Add to add a server to cluster.
   i. Select the server, ORMServer and click Finish.
   j. Repeat the steps g to h and select the second server, ORMServer1.

4.3.2.2 Configuring JDBC Stores

1. Configure the JDBC data sources as follows:
   a. In the domain tree, select Services, JDBC, Data Sources.
   b. Click ORM Data Source.
   c. Click the Targets tab.
   d. Select ORMCluster, All servers in the cluster.
   e. Click Save.
   f. Repeat the steps a to f for ORM XA Data Source, except that in the Step c, click ORM XA Data Source.

2. Create a JDBC Store as follows:
   a. In the domain tree, select Services.
   b. Click Persistent Stores.
   c. Click New and select Create JDBC Store from the list.
   d. In the Name field, type JDBCStore.
   e. In the Target field, select ORMServer.
   f. In the DataSource field, select ORM Data Source.
g. In the Prefix Name field, type jdbcstore.

h. Click OK.

3. Create another JDBC Store as follows:
a. In the domain tree, select Services.
b. Click Persistent Stores.
c. Click New and select Create JDBCStore from the list.
d. In the Name field, type JDBCStore1.
e. In the Target field, select ORMServer1.
f. In the DataSource field, select ORM Data Source.
g. In the Prefix Name field, type jdbcstore1.
h. Click OK.

4.3.2.3 Configuring JMS Servers

1. Create a JMS server for the secondary node as follows:
a. In the domain tree, select Services, Messaging.
b. Click JMS Servers, ORM JMSServer.
c. In the Persistent Store field, select JDBCStore.
d. Click Save.

2. Create another JMS server in the secondary node as follows:
a. In the domain tree, select Services, Messaging.
b. Click JMS Servers.
c. Click New.
d. In the Name field, type ORM JMSServer1.
e. In the Persistent Store field, select JDBCStore1 and then click Next.
f. In the Target field, select ORMServer1.
g. Click Finish.

3. Configure JMS Modules as follows:
a. In the domain tree, select Services, Messaging, JMS Modules.
b. Click ORM JMSModule.
c. Click the Targets tab.
d. Select ORMCluster, All servers in the cluster.
e. Click Save.

4.3.2.4 Configuring a Subdeployment

1. Create a Subdeployment as follows:
a. In the domain tree, select Services, Messaging, JMS Modules.
b. Click ORM JMSModule.
c. Click the Subdeployments tab.
d. Click New.

e. In the Subdeployment Name field, type ORM JMSSubdeployment1.

f. Click Next and select ORM JMSServer1 as the target JMS server.

g. Click Finish.

2. Create a second Subdeployment as follows:

a. In the domain tree, select Services, Messaging, JMS Modules.

b. Click ORM JMSModule.

c. Click the Subdeployments tab.

d. Click New.

f. In the Subdeployment Name field, type cf-sub.

g. Click Next and select ORMCluster, All servers in the cluster.

g. Click Finish.

4.3.2.5 Configuring JMS Topics and Queues

1. Create JMS Topics and Queues using Distributed Option as follows:

a. In the domain tree, select Services, Messaging, JMS Modules.

b. Click ORM JMSModule.

c. Select ORM NotificationTopic, ORM FinisherQueue, ORM LoaderQueue,
ORM IncomingEventQueue, Finalization ORM ConnectionFactory.

d. Click Delete.

2. Recreate the Oracle Role Manager NotificationTopic as follows:

a. Click New.

b. Select Distributed Topic.

c. Click Next.

d. In the Name field, type ORM NotificationTopic.

e. In the JNDI Name field, type orm/topic/NotificationTopic.

f. Click Finish.

3. Recreate the Oracle Role Manager LoaderQueue as follows:

a. Click New.

b. Select Distributed Queue.

c. Click Next.

d. In the Name field, type ORM LoaderQueue.

e. In the JNDI Name field, type orm/queue/LoaderQueue.

f. Click Finish.

4. Recreate the Oracle Role Manager IncomingEventQueue as follows:

a. Click New.

b. Select Distributed Queue.

c. Click Next.
d. In the Name field, type ORM IncomingEventQueue.
e. In the JNDI Name field, type orm/queue/IncomingEventQueue.
f. Click Finish.

4.3.2.6 Configuring Finalization Server

1. Create a server, ORMFinalizationServer as follows:

   ![Note: The new server can be in a different domain, or in the same domain, but not in the cluster.]

   a. In the domain tree, select Environment, Servers.
   b. Click New.
   c. In the Server Name field, type ORMFinalizationServer.
   d. In the Server Listen Port field, type 7074.
   e. Click Finish.

2. Configure a machine for the Oracle Role Manager FinalizationServer as follows:
   a. In the domain tree, select Environment, Servers.
   b. Click ORMFinalizationServer.
   c. Click Machine and select ORM_Machine on which this server is to be run.
   d. Click Save.

3. Create a JMS Server as follows:
   a. In the domain tree, select Services, Messaging, JMS Servers.
   b. Click New.
   c. In the Name field, type FinalizationJMSServer.
   d. Click Next.
   e. In the Target field, select ORMFinalizationServer.
   f. Click Finish.

4. Create a JMS module as follows:
   a. In the domain tree, select Services, Messaging, JMS Modules.
   b. Click New.
   c. In the Name field, type FinalizationJMSModule.
   d. Click Next.
   e. In the Target field, select ORMFinalizationServer.
   f. Click Next.
   g. Click Finish.

5. Create a Subdeployment in the JMS module as follows:
   a. In the domain tree, select Services, Messaging, JMS Modules.
   b. Click FinalizationJMSModule.
c. Click the **Subdeployments** tab.

d. Click **New**.

e. In the **Subdeployment Name** field, type \texttt{ORM JMSSubdeployment}.

f. Click **Next** and select **FinalizationJMSServer** as the target JMS server.

g. Click **Finish**.

6. Create a connection factory as follows:

a. In the domain tree, select **Services, Messaging, JMS Modules**.

b. Click **FinalizationJMSModule**.

c. Click **New**.

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

e. In the **Name** field, type \texttt{Finalization ORM ConnectionFactory}.

f. In the **JNDI Name** field, type \texttt{orm/remote/jms/FinalizationConFac}.

g. Click **Next** and then click **Finish**.

h. Click **Finalization ORM ConnectionFactory**.

i. Click the **Transactions** tab.

j. Select **XA Connection Factory Enabled**.

k. Click **Save**.

7. Create a queue as follows:

a. In the domain tree, select **Services, Messaging, JMS Modules**.

b. Click **FinalizationJMSModule**.

c. Click **New**.

d. Select **Queue** and click **Next**.

e. In the **Name** field, type \texttt{ORM FinalizationQueue}.

f. In the **JNDI Name** field, type \texttt{orm/remote/queue/BtFinisherQueue}.

g. Click **Next**.

h. In the **Subdeployments** field, select \texttt{ORM JMSSubdeployment}.

i. Click **Finish**.

8. Change the configuration of Oracle Role Manager Data Source to target \texttt{ORMFinalizationServer} as follows:

a. In the domain tree, select **Services, JDBC, Data Sources**.

b. Click **ORM Data Source**.

c. Click the **Targets** tab.

d. Select **ORMFinalizationServer**, and ensure that \texttt{ORMCluster} is selected.

e. Click **Save**.

9. Create a JDBC Store as follows:

a. In the domain tree, select **Services, Persistent Stores**.

b. Click **New** and select **Create JDBCStore** from the list.
c. In the Name field, type ORMJDBCStoreF.
d. In the Target field, select ORMFinalizationServer.
e. In the DataSource field, select ORM Data Source.
f. In the Prefix Name field, type ORMF.
g. Click OK.

10. Create a foreign server as follows:
   a. In the domain tree, select Services, Messaging, JMS Modules.
   b. Click ORM JMSModule and click New.
   c. Select Foreign Server and click Next.
   d. In the Name field, type FinalizationServer, click Next and then click Finish.
   e. Click FinalizationServer.
   f. In the JNDI Initial Context Factory field, type weblogic.jndi.WLInitialContextFactory.
   g. In the JNDI Connection URL field, type t3://machine_name:7074.

   Note: The machine_name is the name of the machine where ORMFinalizationServer is deployed. You must not use localhost as a machine name.

   h. Select Default Targeting Enabled and click Save.
   i. Click the Destinations tab and click New.
   j. In the Name field, type ORM FinalizationQueue.
   k. In the Local JNDI Name field, type orm/queue/BtFinisherQueue.
   l. In the Remote JNDI Name field, type orm/remote/queue/BtFinisherQueue and click OK.
   m. Click the Connection Factories tab and click New.
   n. In the Name field, type ORM Finalization ConnectionFactory.
   o. In the Local JNDI Name field, type orm/jms/FinalizationConFac.
   p. In the Remote JNDI Name field, type orm/remote/jms/FinalizationConFac and click OK.

4.3.2.7 Configuring Connection Factory

Configure the connection factory as follows:
1. In the domain tree, select Services, Messaging, JMS Modules.
2. Click ORM JMSModule.
3. Click ORM ConnectionFactory.
4. Deselect Default Targeting Enabled.
5. Click Save.
6. Click Subdeployment tab.
Configuring Oracle WebLogic Server in a Clustered Mode

7. In the **Subdeployment** field, select `cf-sub` and click **Save**.

### 4.3.2.8 Setting the Target
Change the deployed applications (ORMServerApp and webui) to ORMCluster **All servers in the cluster as target**.

### 4.3.2.9 Ensuring the Default Target Enabled for Topics and Queues
Ensure that ORM IncomingEventQueue, ORM LoaderQueue, and ORM NotificationTopic have Default Targeting enabled by performing the following steps:

1. In the domain tree, select **Services, Messaging, JMS Modules**.
2. Click **ORM JMSModule**.
3. Click on **ORM IncomingEventQueue**.
4. Ensure that the Default Targeting Enabled is selected.
5. Click **Save**.
6. Repeat the same for ORM LoaderQueue and ORM Notification Topic.

### 4.3.2.10 Configuring SSL

**Configure SSL for the admin server as follows:**

1. In the domain tree, select **Environment, Servers**.
2. Click **AdminServer(admin)**.
3. Click the **SSL** tab.
4. Click **Advanced**.
5. In the **Hostname Verification** field, select **None**.
6. Click **Save**.

**Note:** You must shutdown all servers after performing the preceding step.

### 4.3.2.11 Pack/unpack the Domain to Secondary Node

**Note:** Ensure that all server node managers are running while performing the following steps.

1. On primary node, run the following command:
   ```
   >cd $WLS_HOME/common/bin
   >pack.cmd -domain=$DOMAIN_HOME -template=tmp/template_x.jar -template_name="template_x" -managed=true
   ```

2. Copy `template_x.jar` to secondary node.
   On secondary node, run the following command:
   ```
   >cd $WLS_HOME/common/bin
   >unpack.cmd -template=??/template_x.jar -domain=$DOMAIN_HOME
   ```
4.3.3 Configuring Apache Failover Proxy

To configure Apache failover proxy:

1. Install Apache HTTP server 2.2.
2. Download the WebLogic Apache plug-in from:
3. Unzip and copy:
   win/mod_wl_22.so to apache_home/modules directory
4. Add the following to httpd.conf file by substituting the values for IP addresses and ports for your environment:
   LoadModule weblogic_module modules/mod_wl_22.so
   <IfModule mod_weblogic.c>
   WebLogicCluster node1_ip:port,node2_ip:port
   </IfModule>
   <Location /webui>
   SetHandler weblogic-handler
   </Location>
   <Location /ormconsole>
   SetHandler weblogic-handler
   </Location>
5. Restart Apache and all WebLogic servers.

You must be able to access webui and console at:
http://myApacheServer/webui
http://myApacheServer/ormconsole

For more information about installing and configuring the Apache HTTP Server Plug-In, refer to the following URL:
http://e-docs.bea.com/wls/docs103/plugins/apache.html

---

**Note:** Start ORMFinalizationServer before starting the Managed Server.
This chapter contains procedures for configuring the IBM WebSphere application servers for Oracle Role Manager in preparation for deployment of the Oracle Role Manager on either nonclustered or clustered server environments. The procedures in this chapter are expected to be performed in the sequence they are presented.

This chapter includes the following sections:

- Preparing WebSphere for a Nonclustered Server Installation
- Preparing WebSphere for a Clustered Server Installation
- Configuring JDBC Providers and Data Sources
- Configuring JMS Messaging Buses and Bus Destinations
- Configuring JMS Queues and Connection Factories
- Configuring JMS Activation Specifications
- Configuring Security
- Configuring Data Upload Size Limit
- Increasing the Transaction Timeout
- Setting Up the Server Virtual Host Information (Clustered Environment Only)
- Deploying Oracle Role Manager

### 5.1 Preparing WebSphere for a Nonclustered Server Installation

This procedure assumes that a WebSphere application server profile has been created for Oracle Role Manager with a host alias set for port access to Oracle Role Manager.

**Note:**

- During profile creation, you must select the option to enable administrative security.
- When configuring WebSphere, it is recommended that you save your settings after every task.

You must configure IBM WebSphere server in SSL mode to operate in a secure environment. For information about configuring SSL for WebSphere server, refer to the following URL:
Preparing WebSphere for a Nonclustered Server Installation


This section includes the following topics:

- Creating a Non-Administrative Server for Deploying Oracle Role Manager
- Configuring WebSphere to Use a Non-Default HTTP Port

5.1.1 Creating a Non-Administrative Server for Deploying Oracle Role Manager

Oracle recommends you to deploy the Oracle Role Manager system on a non-administrative server.

To create a non-administrative server:
1. Run the following command:
   
   [WebSphere Install Dir]/AppServer/profiles/[Profile name]/bin/wsadmin.bat

   Note: You must ensure that the WebSphere server is running before performing this step.

2. On the wsadmin prompt (wsadmin>), enter the following commands:
   
   $AdminTask createApplicationServer <Websphere Node Name> { -name orm -templateName default }
   $AdminConfig save
   quit

   Note: The node name specified in the first command must be same as the node name of the administrative server that gets created by default, for example server1. You can find out the node name on the admin console by going to Servers, Application Servers.

5.1.2 Configuring WebSphere to Use a Non-Default HTTP Port

If you are deploying the system on a non-administrative server, then perform the following steps:

To configure the WebSphere application server to use a non-default port:
1. If not already on the WebSphere administrative console, in a Web browser, type the URL, for example:

   http://<appserverhost>:9060/ibm/console

2. Select Environment, Virtual Host, default_host, Host Aliases and then click New.
3. In the Host Name field, type *.
4. In the Port field, enter the HTTP port number of the non-admin server on which Oracle Role Manager is going to be deployed, for example 9081.
5. Click OK.
5.2 Preparing WebSphere for a Clustered Server Installation

This section describes the steps to prepare WebSphere for deployment of Oracle Role Manager in a clustered application server environment.

---

**Caution:** Deploying an application in a clustered environment is a complex procedure. This document assumes that you have expertise in installing and using applications in a WebSphere cluster. These instructions provide the Oracle Role Manager-specific details only. They are not complete instructions for setting up a WebSphere cluster. For more information about clustering, refer to WebSphere documentation.

---

This section includes the following topics:

- Installing Network Deployment Manager
- Upgrading NDM
- Preparing the Database
- Creating Profiles on Application Servers
- Setting Up the Servers
- Creating the Cluster

5.2.1 Installing Network Deployment Manager

You need to install Network Deployment Manager (NDM) if you are setting up the WebSphere cluster. Install NDM on the same computer where WebSphere Application Server is installed.

**To install NDM:**

1. Launch the NDM installer (double click Install.exe).
2. Specify the following information:
   a. Select the product installation directory.
   b. Under WebSphere Application Server environments, choose the **None** option.
3. Continue with the installation. When the NDM installer launches the WebSphere "First Steps" application, exit it and finish the installation.

5.2.2 Upgrading NDM

**To upgrade the NDM from 6.1 to 6.1.0.21:**

1. Install the update installer to fix pack 21.
2. Accept default values.

5.2.3 Preparing the Database

Preparing the database includes:

- Creating the database for finalization bus
- Creating the database for each planned server
To create the database user for finalization bus:
To create the database user for finalization bus, for example, WSMgFin, use the following SQL commands:

```sql
create user WSMgFin identified by <password>
default tablespace ORM_DATA
temporary tablespace ORM_TEMP;
grant connect to WSMgFin;
grant create session to WSMgFin;
grant resource to WSMgFin;
commit;
```

To create the database user for each planned server:
To create the database user for each planned server in the cluster, for example, WSMgEng1 and WSMgEng2, run the following SQL commands:

```sql
create user WSMgEng1 identified by <password>
default tablespace ORM_DATA
temporary tablespace ORM_TEMP;
grant connect to WSMgEng1;
grant create session to WSMgEng1;
grant resource to WSMgEng1;
create user WSMgEng2 identified by <password>
default tablespace ORM_DATA
temporary tablespace ORM_TEMP;
grant connect to WSMgEng2;
grant create session to WSMgEng2;
grant resource to WSMgEng2;
commit;
```

### 5.2.4 Creating Profiles on Application Servers

To create primary profile on server1:
1. Select Start, Programs, IBM WebSphere, Application Server Network Deployment, and then select Profile Management tool.
2. Select Cell (deployment manager and a federated application server), and then click Next.
3. Select Typical Profile Creation, and then click Next.
4. Select Enable administrative security, enter the user name and password and click Next.
5. Click Create to create the primary profile.

To create secondary profile on server2:
1. Select Start, Programs, IBM WebSphere, Application Server Network Deployment, and then select Profile Management tool.
2. Select Custom Profile for Environments and click Next.
3. Select Advanced Profile creation, and then click Next.
4. In the Profile Name field, enter the profile name and click Next.
5. In the Node Name field, enter the Hostname of the computer and click Next.
6. Select Federate this node later, and then click Next.
7. Click Create to create the secondary profile.
5.2.5 Setting Up the Servers

**To start the deployment manager:**

1. On server1, in the command prompt, change to the `WEBSPHERE_HOME\profiles\DEPLOYMENT_MANAGER_PROFILE_NAME\bin` directory
   Where:
   - `WEBSPHERE_HOME` is the home directory of WebSphere
   - `DEPLOYMENT_MANAGER_PROFILE_NAME` is the name of the deployment manager profile being used
   
   For example:
   ```
   C:\Program Files\IBM\WebSphere\AppServer\profiles\Dmgr01\bin
   ```
   
2. Run the following command:
   ```
   startManager.bat
   ```

   **Note:** Before performing the following procedure, ensure that the WebSphere application server is down.

**To start the node:**

1. On server1, in the command prompt, change to the `WEBSPHERE_HOME\profiles\PRIMARY_PROFILE_NAME\bin` directory
   Where:
   - `WEBSPHERE_HOME` is the home directory of WebSphere
   - `PRIMARY_PROFILE_NAME` is the name of the primary application server profile being used
   
   For example:
   ```
   C:\Program Files\IBM\WebSphere\AppServer\profiles\AppSrv01\bin
   ```
   
2. Run the following command:
   ```
   startNode.bat
   ```

**To add a node:**

1. On server2, in the command prompt, change to the `WEBSPHERE_HOME\profiles\SECONDARY_PROFILE_NAME\bin` directory
   Where:
   - `WEBSPHERE_HOME` is the home directory of WebSphere
   - `SECONDARY_PROFILE_NAME` is the name of the secondary application server profile being used
   
   For example:
   ```
   C:\Program Files\IBM\WebSphere\AppServer\profiles\Custom01\bin
   ```
   
2. Run the following command:
addNode.bat <Primary_Node_Machine_Name>
<Cell_Deployment_Manager_SOAP_Connector_Port> -username websphere -password websphere

5.2.6 Creating the Cluster

To create the cluster:
1. Using a Web browser, connect to the Network Deployment Manager administrative console by navigating to the following URL:
   http://NDM_HOST:NDM_PORT/admin
2. Log on to the system.
3. Click Servers in the left panel.
4. Click Clusters.
5. Click New.
   a. Enter the cluster name, for example, ORM Cluster.
   b. Ensure that you select the Prefer local and Configure HttpSession memory-to-memory replication check boxes, and then click Next.
6. Enter the first node member's name, for example, ORM Server1 and click Next.
7. Click Add Member.
8. Enter a name for the second node member, for example ORM Server2.
9. Select the node for the second node member, then click Add Member.
10. Click Next, then click Finish.

5.2.7 Distributing the Oracle Role Manager Libraries

For clustered server environments, the Oracle Role Manager libraries must exist in the identical location on all nodes where the Oracle Role Manager server exists.

To distribute the Oracle Role Manager libraries:
1. On the primary server where Oracle Role Manager is installed, navigate to the ORM_HOME/lib directory.
2. Make a note of the full path, for example, C:\oracle\orm\lib.
3. On each node for Oracle Role Manager, create a directory and path that exactly matches the path in the previous step.
4. Copy all of the files from ORM_HOME/lib into each of the directories created in the previous step.

5.3 Configuring JDBC Providers and Data Sources

This section includes the following topics:
- Configuring JDBC Providers
- Reconfiguring JDBC Providers
- Creating the Oracle Role Manager Database Credentials
5.3.1 Configuring JDBC Providers

To configure the transaction (XA) and non-transaction JDBC providers:

1. If the Oracle Role Manager database is Oracle 11g, copy the JDBC driver as follows:
   a. On the Oracle database host, navigate to $ORA_HOME/jdbc/lib$.
   b. Copy the ojdbc5.jar file from $ORACLE_HOME/jdbc/lib$ into $ORM_HOME/lib$ on the application server host.
   c. For clustered server environments, repeat these steps so the JDBC driver exists in $ORM_HOME/lib$ on all nodes where Oracle Role Manager servers exist.

2. If not already on the WebSphere administrative console, in a Web browser, type the URL, for example:
   http://<appserverhost>:9060/ibm/console

3. From Resources, select JDBC, then click JDBC Providers.

4. For nonclustered configuration, select the cell scope, Node=node_name,
   Server=server_name, from the Scope list.

5. For clustered configuration, select the cluster scope, Cluster=cluster_name, from the Scope list.

6. Click New to create the XA JDBC provider.

7. Select Oracle as the database type.

8. Select Oracle JDBC Driver as the provider type.

9. Select XA datasource as the Implementation type, and then click Next.

10. In the Directory location field, type the full path to the directory containing the Oracle JDBC driver.

   For Oracle 10g, the correct driver is ojdbc14.jar. This driver is contained in $ORM_HOME/lib$, so enter that path.

   For Oracle 11g, the correct driver is ojdbc5.jar. This driver was copied to $ORM_HOME/lib$ Step 1, so enter that path.

11. Click Next, then Finish.

12. Click New to create the non-XA JDBC provider.

13. Select Oracle as the database type.

14. Select Oracle JDBC Driver as the provider type.

15. Select Connection pool data source as the Implementation type, and then click Next.

16. Ensure that the value in the Directory location field is correct, and then click Next.

17. Click Finish.
5.3.2 Reconfiguring JDBC Providers

This section is applicable only when you are using Oracle 11g JDBC driver (ojdbc5.jar) to connect to oracle 11g database.

Oracle recommends you to use ojdbc5.jar when configuring Oracle Role Manager with Oracle 11g database. WebSphere Application Server by default creates Oracle JDBC providers using the Oracle 10g JDBC driver (ojdbc14.jar). In the administrative console, the wizard for creating new data sources does not allow you to change the name of the jar file. For example, you cannot change the entry from ojdbc14.jar to ojdbc5.jar. For more information about JDBC providers, refer to the following link:


After you create the JDBC provider using the wizard, modify it to change the class path entry to reflect the location of ojdbc5.jar as follows:

To reconfigure the JDBC providers:
This procedure assumes that you have already performed the steps mentioned in Section 5.3.1.

1. If not already on the WebSphere administrative console, in a Web browser, enter the URL, for example: http://<appserverhost>:9060/ibm/console.
2. In the administrative console, go to Resources, JDBC, JDBC Providers.
3. Select the cell scope from the Scope list, and then click on JDBC provider, Oracle JDBC Driver.
4. In the Class path field, enter the full path of the JDBC drivers ojdbc5.jar, for example, ORM_HOME/lib/ojdbc5.jar.
5. Click Apply.
6. Click Save.
7. Repeat the steps from 2 to 6 for the JDBC provider, Oracle JDBC Driver (XA).

Note: You must execute these steps before creating any data sources as mentioned in "Configuring the Non-XA Data Source" on page 5-9 and "Configuring the Transaction (XA) Data Source" on page 5-10. If the data sources are already created, then you must recreate after deleting them.

5.3.3 Creating the Oracle Role Manager Database Credentials

To create the Oracle Role Manager database alias:
1. From Security, select Secure administration, applications, and infrastructure.
2. In the Authentication area, select Java Authentication and Authorization Service and then click the J2C authentication data link.
3. Click New.
4. Enter a name for the alias, for example, ORM Database to identify the Oracle Role Manager database.
5. Type the user ID and password for the Oracle Role Manager application user as specified in Section 3.2.2.

6. Click OK.

7. For clustered environments, repeat this procedure for other messaging engines in the cluster, for example, WSMsgFin, WSMsgEng1, and WSMsgEng2.

---

**Note:** The messaging engine names and passwords must match those that were used in Section 5.2.3 when preparing the database.

---

### 5.3.4 Configuring the Non-XA Data Source

To configure the non-XA data source and credentials:

1. Go to Resources, JDBC, Data sources.

2. For nonclustered server environments, select the same cell scope used in Section 5.3.1, then click **New**.

3. For clustered server environments, select the same cluster scope used in Section 5.3.1, then click **New**.

4. In the **Data source name** field, type a name for the non-XA data source, for example, **ORM Non-XA Data source**.

5. In the **JNDI name** field, type **orm/jdbc/ORMServerDS**, and then click **Next**.

6. Choose an existing JDBC provider and select the non-XA JDBC provider you created in Section 5.3.1, for example, **Oracle JDBC Driver**, and then click **Next**.

7. In the **URL** field, type the JDBC connection URL:

   \[jdbc:oracle:thin:@<server>[:<port>]:<database_name>\]

   For example:

   \[jdbc:oracle:thin:@localhost:1521:orcl\]

8. Select **Oracle10g data store helper** from the list, and then click **Next**.

   **Note:** You must use Oracle11g data store helper for Oracle 11g database.

9. Click **Finish**.

   The non-XA data source for Oracle Role Manager should appear in the list.

10. Click the name of the new non-XA data source to display details.

11. In the Container-managed authentication alias list, select the database alias created in Step 4 of Section 5.3.3 and then click **Apply**.

   The reference to this option being deprecated can be ignored.

12. On the same page, in the Additional Properties section, click Connection Pool Properties and set the Maximum connections to 30.

13. Click **OK**.

   The reference to the failed test connection can be ignored because the connection will work after restarting the deployment manager.
5.3.5 Configuring the Transaction (XA) Data Source

To configure the XA data source:

1. Go to Resources, JDBC, Data sources.
2. For nonclustered server environments, select the same cell scope used in Section 5.3.1, then click New.
3. For clustered server environments, select the same cluster scope used in Section 5.3.1, then click New.
4. In the Data source name field, type a name for the XA data source, for example, ORM XA Data source.
5. In the JNDI name field, type orm/jdbc/ORMServerXADS, and then click Next.
6. Choose an existing JDBC provider and select the XA JDBC provider that you created in Section 5.3.1, for example, Oracle JDBC Driver (XA), and then click Next.
7. In the URL field, type the JDBC connection URL:
   
jdbc:oracle:thin:@<server>[:<port>]:<database_name>
   
   For example:
   
jdbc:oracle:thin:@localhost:1521:orcl
8. Select Oracle10g data store helper from the list, and then click Next.

---

**Note:** You must use Oracle11g data store helper for Oracle 11g database.

---

9. Click Finish.

   Both the new XA data source and non-XA data source for Oracle Role Manager must appear in the list.

10. Click the name of the XA data source to display details.

11. In the Container-managed authentication alias list, select the database alias created in Section 5.3.3, and then click Apply.

   The reference to this option being deprecated can be ignored.

12. On the same page, in the Additional Properties section, click Connection Pool Properties and set the Maximum connections to 30.

13. Click OK.

   The reference to the failed test connection can be ignored because the connection will work after restarting the deployment manager.

5.3.6 Configuring the Messaging Engine (XA) Data Source (Clustered Environments Only)

---

**Note:** This is section is only for clustered configuration, perform the steps mentioned in this section following the order listed above.

---
To configure the messaging engine (XA) data source:
1. Go to Resources, JDBC, Data sources.
2. Select the same cluster scope used in Section 5.3.1, then click New.
3. In the Data source name field, type a name for the XA data source, for example, ORM WSMsgEng Data source.
4. In the JNDI name field, type orm/jdbc/WSMsgEngDS, and then click Next.
5. Choose an existing JDBC provider and select the XA JDBC provider that you created in Section 5.3.1, for example, Oracle JDBC Driver (XA), and then click Next.
6. In the URL field, type the JDBC connection URL:
   `jdbc:oracle:thin:@<server>[:<port>]:<database_name>`
   For example: `jdbc:oracle:thin:@localhost:1521:orcl`
7. Select Oracle10g data store helper from the list, and then click Next.
   
   **Note:** You must use Oracle11g data store helper for Oracle 11g database.
8. Click Finish.

   The Messaging Engine (XA) data source for Oracle Role Manager should appear in the list.
9. Click the name of the Messaging Engine (XA) data source to display details.
10. In the Additional Properties section, click Connection Pool Properties and set the Maximum connections to 30.
11. Click OK.

   The reference to the failed test connection can be ignored because the connection will work after the authentication alias is configured.

### 5.4 Configuring JMS Messaging Buses and Bus Destinations

This section includes the following topics:
- Configuring the JMS messaging buses (Nonclustered Environments Only)
- Configuring the JMS messaging buses (Clustered Environments Only)
- Configuring Bus Destinations

#### 5.4.1 Configuring the JMS messaging buses (Nonclustered Environments Only)

To configure the JMS messaging buses:
1. Select Service integration, Buses, and then click New.
2. Type a name for the Oracle Role Manager bus, such as ORM Bus, and deselect the Bus security check box, and then click Next.
3. Click Finish.
4. Click **New** to create the finalization bus.

5. Type a name for the finalization bus, such as **ORM Finalization Bus**, and deselect the **Bus security** check box, and then click **Next**.

---

**Note:** If you do not set the name to "ORM Finalization Bus", you must provide the "oracle.iam.rm.finalization.WebSphereFinalizationBusName" system property with the name that you use.

- If you want to use a different name for the finalization bus, you must follow the Step 6 to set the WebSphereFinalizationBusName property. Otherwise, skip the next step.

6. If you use a name other than ORM Finalization Bus:
   a. Select **Servers, Application Servers**.
   b. Click the server on which Oracle Role Manager is installed.
   c. In the Server Infrastructure section, click **Java and Process Management, Process Definition**.
   d. Click **Java Virtual Machine**.
   e. Click **Custom Properties**.
   f. Click **New**.
   g. In the **Name** field, type the following text:
      
      `oracle.iam.rm.finalization.WebSphereFinalizationBusName`
      
   h. In the **Value** field, type the name you set for the finalization bus.
   i. Click **OK**.
   j. Click **Finish**.

7. Add the server to each of the newly created buses as follows:
   a. Click **ORM Bus** link, and then click **Bus members**.
   b. Click **Add**.
   c. Select the server to use for Oracle Role Manager, and then click **Next**.
   d. In the **Select the type of message store** list, select **File Store**, click **Next**, and then click **Next** again.
   e. Click **Finish**.

### 5.4.2 Configuring the JMS messaging buses (Clustered Environments Only)

**To configure the JMS messaging buses:**

1. Select **Service integration, Buses**, and then click **New**.

2. Type a name for the Oracle Role Manager bus, such as **ORM Bus**, and deselect the **Bus security** check box, and then click **Next**.

3. Click **Finish**.

4. Click **New** to create ORM Notification Bus, deselect the **Bus Security** check box and click **Next**.
5. Click **Finish**.

6. Click **New** to create the finalization bus.

7. Type a name for the finalization bus, such as **ORM Finalization Bus**, deselect the **Bus security** check box, and click **Next**.

   **Note:** If you do not set the name to "ORM Finalization Bus", you must provide the "oracle.iam.rm.finalization.WebSphereFinalizationBusName" system property with the name that you use.

   - If you want to use a different name for the finalization bus, you must follow the Step 6 to set the WebSphereFinalizationBusName property. Otherwise, skip the next step.

8. If you use a name other than ORM Finalization Bus:
   a. Select **Servers, Application Servers**.
   b. Click the server on which Oracle Role Manager is installed.
   c. In the Server Infrastructure section, click **Java and Process Management, Process Definition**.
   d. Click **Java Virtual Machine**.
   e. Click **Custom Properties**.
   f. Click **New**.
   g. In the **Name** field, type the following text:
      
      oracle.iam.rm.finalization.WebSphereFinalizationBusName
      
   h. In the **Value** field, type the name you set for the finalization bus.
   i. Click **OK**.
   j. Click **Finish**.

9. Add the server to the ORM Bus as follows:
   a. Click the **ORM Bus** link, then click **Bus members**.
   b. Click **Add**.
   c. Select the **ORM Cluster** (not either of servers) to use for Oracle Role Manager and click **Next**.
   d. In the **Select the type of message store** list, select **Data Store**, then click **Next**.
   e. Specify the following values:
      
      JNDI name: `orm/jdbc/WSMsgEngDS`
      
      Schema name: `WSMsgEng1`
      
      Authentication alias: `WSMsgEng1`
      
   f. Click **Next**, then click **Finish**.
   g. Go to ORM Bus, Bus Members, and ORM Cluster.
   h. Click **Add Messaging Engine**.
   i. Select **Data Store**, then click **Next**.
j. Specify the following values:
   JNDI name: orm/jdbc/WSMsgEngDS
   Schema name: WSMgEng2
   Authentication alias: WSMgEng2

k. Click Next, then click Finish.

10. Add the server to the ORM Finalization Bus as follows:
   a. Click the ORM Finalization Bus link, then click Bus members.
   b. Click Add.
   c. Select the ORM Cluster (not either of servers) to use for Oracle Role Manager, then click Next.
   d. In the Select the type of message store list, select Data Store, then click Next.
   e. Choose the Use existing data source option and specify the following values:
      JNDI name: orm/jdbc/WSMsgEngDS
      Schema name: WSMgFin
      Authentication alias: WSMgFin
   f. Click Next, then click Finish.

11. Add the server to the ORM Notification Bus as follows:
   a. Click the ORM Notification Bus link, and then click Bus members.
   b. Click Add.
   c. Select the ORM Cluster (not either of servers) to use for Oracle Role Manager and click Next.
   d. In the Select the type of message store list, select File Store, then click Next.
   e. Specify the log directory path, for example, C:\WSlogs.
   f. Specify the permanent directory path, for example, C:\WSlogs.
   g. Click Next, then click Finish.

12. Go to Servers, Core groups, Core group settings.
13. Select DefaultCoreGroup.
14. Click Policies.
15. For each server in the cluster:
   a. Click New.
   b. Select One of N policy and click Next.
   c. Specify the name, for example, Server1 SIB Policy, Server2 SIB Policy.
   d. Specify 120 for the Is alive timer, select the Failback checkbox and click Apply.
   e. Click Matching Criteria and add the following criterias:
      ■ In the Name field enter IBM_hc and in the Value field enter ORM Cluster.
      ■ In the Name field enter WSAF_SIB_BUS and in the Value field enter ORM Bus.
In the **Name** field enter `WSAF_SIBMESSAGING_ENGINE` and in the **Value** field enter the name of the messaging engine for the server in question. For example:

- For **Server1 SIB Policy**, in the **Value** field, enter ORM Cluster.000-ORM Bus.
- For **Server2 SIB Policy**, in the **Value** field, enter Cluster.001-ORM Bus.

In the **Name** field enter `type` and in the **Value** field as `WSAF_SIB`.

16. Click **Preferred Servers** and specify **ORM Server1** for the **Server1 SIB Policy** and **ORM Server2** for the **Server2 SIB Policy**.

17. Click **OK**.

### 5.4.3 Configuring Bus Destinations

**To configure the Oracle Role Manager bus and finalization bus destinations:**

1. If not already on the Buses page, go to Service integration, Buses.
2. Click the **ORM Bus** link, and then click **Destinations**.
3. Click **New**.
4. Select **Queue** as the destination type, and then click **Next**.
5. Type **Loader Queue** as the identifier, and then click **Next**.
6. Specify the bus member to own the queue, and then click **Next**.
7. Click **Finish**.
8. Repeat these steps, but this time, type **Incoming Event Queue** as the identifier.
9. For nonclustered server environments:
   a. Click **New**.
   b. Select **Topic space**, then click **Next**.
10. For clustered server environments:
    a. Click **ORM Notification Bus**.
    b. Click **Destinations**, then click **New**.
    c. Select **Topic space**, then click **Next**.
11. Type **Notification Topic** as the identifier, and then click **Next**.
12. Click **Finish**.
13. Click **ORM Finalization Bus**, then click **Destinations**

---

**Note:** The bus name you select here must match the finalization bus created in Section 5.4.1, for nonclustered environments or Section 5.4.2, for clustered environments.

14. Click **New**.
15. Choose **Queue** as the destination type, and then click **Next**.
16. Type **Finisher Queue** as the identifier, and then click **Next**.
17. Specify the bus member to own the queue, and then click Next.
18. Click Finish.

5.5 Configuring JMS Queues and Connection Factories

This section includes the following topics:
- Configuring JMS Queue Connection Factories
- Configuring the JMS Topic Connection Factory
- Configuring JMS Queues
- Configuring the JMS Notification Topic

5.5.1 Configuring JMS Queue Connection Factories

To configure JMS queue connection factories:
1. Go to Resources, JMS, Queue connection factories.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Choose Default messaging provider, and then click OK.
4. In the Name field, type a name for the Oracle Role Manager connection factory, such as ORM QCF.
5. In the JNDI name field, type orm/jms/QueueConFac.
6. In the Bus name list, select ORM Bus, and then click OK.
7. Click New.
8. Select Default messaging provider, and then click OK.
9. In the Name field, type a name for the Oracle Role Manager connection factory for finalization, such as ORM_Finalition QCF.
10. In the JNDI name field, type orm/jms/FinalizationQueueConFac.
11. In the Bus name list, select ORM Finalization Bus.

Note: The bus name you select here must match the finalization bus created in Section 5.4.1, for nonclustered environments or Section 5.4.2, for clustered environments.

12. Click OK.

5.5.2 Configuring the JMS Topic Connection Factory

To configure the JMS topic connection factory:
1. Go to Resources, JMS, Topic connection factories.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Select Default messaging provider, and then click OK.
4. In the Name field, type a name for the Oracle Role Manager topic connection factory, such
5.5.3 Configuring JMS Queues

To configure the Loader queue:
1. Go to Resources, JMS, Queues.
2. Select the same cell or cluster scope used in Section 5.3.1, and then click New.
3. Select Default messaging provider, then click OK.
4. In the Name field, type ORM Loader.
5. In the JNDI name field, type orm/jms/LoaderQueue.
6. In the Bus name list, select ORM Bus.
7. In the Queue name list, select Loader Queue.
8. Click OK.

To configure the Incoming Event queue:
1. Go to Resources, JMS, Queues.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Choose Default messaging provider, and then click OK.
4. In the Name field, type ORM Incoming Event Queue.
5. In the JNDI name field, type orm/jms/IncomingEventQueue.
6. In the Bus name list, select ORM Bus.
7. In the Queue name list, select Incoming Event Queue.
8. Click OK.

To configure the Finalization queue:
1. Go to Resources, JMS, Queues, select the same cell or cluster scope used in Section 5.3.1, then click New.
2. Select Default messaging provider, and then click OK.
3. In the Name field, type ORM Finisher Queue.
4. In the JNDI name field, type orm/jms/FinisherQueue.
5. In the Bus name list, select ORM Finalization Bus.
6. In the Queue name list, select Finisher Queue.
7. Click OK.

5.5.4 Configuring the JMS Notification Topic

To configure the Notification Topic:
1. Go to Resources, JMS, Topics.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Select Default messaging provider, and then click OK.
4. In the Name and the Topic Name fields, type ORM Notification Topic.
5. In the JNDI name field, type orm/jms/NotificationTopic.
6. For nonclustered server environments, in the Bus name list, select ORM Bus.
7. For clustered server environments, in the Bus name list, select ORM Notification Bus.
8. In the Topic space list, select Notification Topic.
9. Click OK.

5.6 Configuring JMS Activation Specifications

To configure the Loader AS:
1. Go to Resources, JMS, Activation specifications.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Select Default messaging provider, and then click OK.
4. In the Name field, type ORM Loader AS.
5. In the JNDI name field, type orm/jms/LoaderAS.
6. In the Destination type list, select Queue.
7. In the Destination JNDI name field, type orm/jms/LoaderQueue.
8. In the Bus name list, select ORM Bus.
9. Click OK.

To configure the Incoming Event AS:
1. Go to Resources, JMS, Activation specifications.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Select Default messaging provider, and then click OK.
4. In the Name field, type ORM Incoming Event AS.
5. In the JNDI name field, type orm/jms/IncomingEventAS.

Note: The bus name you select here must match the finalization bus created in Section 5.4.1, for nonclustered environments or Section 5.4.2, for clustered environments.
6. In the Destination type list, select Queue.
7. In the Destination JNDI name field, type `orm/jms/IncomingEventQueue`.
8. In the Bus name list, select ORM Bus.
9. Click OK.

To configure the Finisher AS:
1. Go to Resources, JMS, Activation specifications.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Choose Default messaging provider, and then click OK.
4. In the Name field, type `ORM Finisher AS`.
5. In the JNDI name field, type `orm/jms/FinisherAS`.
6. In the Destination type list, select Queue.
7. In the Destination JNDI name field, type `orm/jms/FinisherQueue`.
8. In the Bus name list, select ORM Finalization Bus.

---

**Note:** The bus name you select here must match the finalization bus created in Section 5.4.1, for nonclustered environments or Section 5.4.2, for clustered environments.

9. In the Maximum concurrent endpoints field, set the value to 1.

---

**Note:** You must set the value of Maximum concurrent endpoints as 1 to ensure the ORM application to function properly.

10. Click OK.

To configure the Notification AS:
1. Go to Resources, JMS, Activation specifications.
2. Select the same cell or cluster scope used in Section 5.3.1, then click New.
3. Choose Default messaging provider, and then click OK.
4. In the Name field, type `ORM Notification AS`.
5. In the JNDI name field, type `orm/jms/NotificationAS`.
6. In the Destination type list, select Topic.
7. In the Destination JNDI name field, type `orm/jms/NotificationTopic`.
8. For nonclustered server environments, in the Bus name list, select ORM Bus.
9. For clustered server environments, in the Bus name list, select ORM Notification Bus.
10. Click OK.

### 5.7 Configuring Security

This section includes the following topics:
5.7.1 Securing the WebSphere Installation/Console

To secure the WebSphere installation/console:
1. In a Web browser, type the URL to connect to the WebSphere administrative console. For example:
   
   http://<appserverhost>:9060/ibm/console

2. Go to Security, Secure administration, applications, and infrastructure.

3. Click Security Configuration Wizard.

4. Select Enable application security and Use Java 2 security to restrict application access to local resources check boxes and then click Next.

5. In the Select user repository: section, select Federated repositories and then click Next.

6. Type username and password for administrative user, for example, websphere/websphere and then click Next.

   Note: The username and password specified in this step must be the same as the username and password used to log in to the administrative console.

7. Click Finish.

8. Clear the Warn if applications are granted custom permissions check box.

9. Click Apply, and then save your changes.

10. Configure the server for Oracle Role Manager as follows:

    a. From Servers, select Application Servers.

    b. Select the server for Oracle Role Manager.

   Note: For clustered environments, the server is on the cluster to use for Oracle Role Manager.

    c. In the Server Infrastructure section, click Java and Process Management, then click Process Definition.

    d. In the Additional Properties section, click Java Virtual Machine.

    e. In the Additional Properties section, click Custom Properties.

    f. Click New.
g. In the Name field, type com.ibm.websphere.java2secman.nolog.

h. In the Value field, type true.

i. In the Description field, type Stop over_logging of security warnings.

j. Click OK, and then click Save.

k. For clustered environments, repeat the substeps in Step 10 for all additional servers on the cluster.

5.7.2 Creating a Custom User

To create a custom user:
1. Log in to the Administrative Console.
2. Go to Users and Groups, Manage Users.
3. Click Create and type the following:
   a. User ID, for example, ormserver.
   b. First Name, for example, ORM.
   c. Last Name, for example, Server.
   d. Password, for example, ormserver.
4. Click Create, and then click Close.
5. Go to Users and Groups, Administrative User Roles.
6. Click Add and perform the following substeps:
   a. In the User field, type the user ID created in Step 3.
   b. In the Role(s) field, select Operator.
   c. Click OK.

5.7.3 Creating Alias for Custom User

To create alias for the custom user:
1. Go to Security, Secure administration, applications, and infrastructure.
2. In the Authentication section, expand Java Authentication and Authorization Service and then click J2C authentication data.
3. Click New and perform the following substeps:
   a. In the Alias field, type the alias name, for example, ormserver.
   b. In the User field, type the User ID that you created in Step 3 of Section 5.7.2.
   c. In the Password field, type the password that you created in Step 3 of Section 5.7.2.
4. Click OK.
5.7.4 Configuring Connection Factory Authentication

**To configure authentication for the connection factories:**
2. Click the title of the connection factory.
3. Set the Container-managed authentication alias to the custom user alias created in Section 5.7.3, then click OK.
   The reference to this option being deprecated can be ignored.
4. Repeat these steps for each of the new connection factories, then save your changes.

5.7.5 Configuring Activation Specification Authentication

**To configure authentication for the activation specifications:**
1. Go to Resources, Resource Adapters, J2C activation specification.
2. Click the title of the new activation specification.
3. Set the Authentication alias to the user alias created in Section 5.7.3, then click OK.
4. Repeat these steps for each of the new activation specifications, and then save your changes.

5.7.6 Securing the Message Bus

**To secure the message bus:**
2. In the Security column, for each Oracle Role Manager bus, click Disabled.
3. Select the Enable bus security check box, and then click Apply.

```
Note: Enable bus security field is disabled if you have deselected Enable Bus Security field while configuring JMS messaging buses in the step 5 of Section 5.4.1 for nonclustered environments, or step 7 of Section 5.4.2 for clustered environments
```

4. For each Oracle Role Manager bus:
   a. Click Enabled.
   b. In the Additional Properties section, click Users and groups in the bus connector role.
5. Click New and select User Name.
6. In the User Name field, type the User ID that you created in Step 3 of Section 5.7.2, then click OK.

5.8 Configuring Data Upload Size Limit

You can upload a DAR file to load data of maximum size 10 MB into the system. If you try to load data larger than this maximum upload size, you get an error message.
Optionally, you can configure the maximum data upload size limit to a higher or lower value than the default settings.

To configure the data upload size limit:
1. From **Servers**, select **Application Servers**.
2. Click the server for Oracle Role Manager, for example, **ORM Server**.
3. In the **Server Infrastructure** section, expand **Java and Process Management**, and then click **Process Definition**.
4. In the **Additional Properties** section, click **Java Virtual Machine**, and then click **Custom Properties**.
5. Click **New** and type the following information:
   a. In the **Name** field, type `oracle.iam.rm.loader.max_upload_size`.
   b. In the **Value** field, type the maximum size (in bytes) of data upload that you want to set, for example, 10485760.
   c. In the **Description** field, type the description for the maximum upload size that you set, for example, maximum size limit for the Oracle Role Manager loader.
   d. Click **OK**.
6. For clustered server environments, repeat these steps for each Oracle Role Manager server in the cluster.

---

**Note:** The default value of the maximum size of data upload is 10 MB (10x1024x1024 = 10485760). You can modify this value to any other limit.

c. In the **Description** field, type the description for the maximum upload size that you set, for example, maximum size limit for the Oracle Role Manager loader.

---

5.9 **Increasing the Transaction Timeout**

To increase the transaction timeout:
1. From **Servers**, select **Application Servers**.
2. Click the server for Oracle Role Manager, for example, **ORM Server**.
3. In the **Container Settings** section, expand **Container Services**, and then click **Transaction Service**.
4. In the **Total transaction lifetime timeout** field, type the new value, 1200, if you want to change the default value, which is 120.
5. In the **Maximum transaction timeout** field, type the new value, 1200, if you want to change the default value, which is 300.
6. Click **Apply** to save the server settings.
7. For clustered server environments, repeat the preceding steps for each Oracle Role Manager server in the cluster.
8. Restart the server or cluster, accordingly.
5.10 Setting Up the Server Virtual Host Information (Clustered Environment Only)

The application server uses the virtual host information setup on the Node Manager to properly configure the Web server plug-ins to distribute the load and deal with failover. When you add a server to the cluster, you must update the virtual host information.

To update the virtual host information:
1. Ensure that Node Manager is running.
2. Using a Web browser, connect to the Node Manager administrative console by navigating to the following URL:
   http://NDM_HOST:NDM_PORT/admin
3. Log in using the Oracle Identity Manager Administrator name and password that you specified during installation.
4. In the left pane, click Servers.
5. Click Application Servers, then click ORM Server1.
6. In the Communications section, click Ports.
   Make note of the port numbers for WC_defaulthost. You will need this port number for the new host alias created later in this procedure.
7. In the left pane, click Environment.
8. Click Virtual Hosts, then click default_host.
9. Click Host Aliases, then click New.
10. In the Host Name field, enter an asterisk (*).
11. In the Port field, enter the port that you noted as the port for WC_defaulthost, then click Apply.
12. Select Preferences, Synchronize changes with Nodes, then click Apply.
13. Click Save.
   Virtual host setup for the ORM Server1 server is complete.
14. Repeat the procedure for all available servers in ORM_CLUSTER, for example, ORM Server2 and so forth.

5.11 Deploying Oracle Role Manager

This section includes the following topics:
- Deploying the Oracle Role Manager Server
- Deploying the Oracle Role Manager Web Application
5.11.1 Deploying the Oracle Role Manager Server

To deploy the Oracle Role Manager server:
1. Go to Applications, Install New Application.
2. Choose Remote file system, click Browse to navigate to the ORM_HOME/lib directory, select server.ear, and then click OK.
3. Click Next.
4. On the Map modules to servers page, perform the following substeps:
   a. From the Clusters and Servers list, select the server or cluster on which Oracle Role Manager is to be deployed.
   b. Select both modules, server.jar and ormconsole.
   c. Click Apply.
   d. Click Next.
5. Click Finish.
   This could take a few moments to complete.
6. Click Save.
7. For clustered server environments, click OK.

To associate the custom user to the Oracle Role Manager server:
1. Go to Applications, Enterprise Applications.
2. Select ORM Server.
3. In the Detail Properties section, click Security role to user/group mapping.
4. Select ORMServer, and then click Look up users.
5. Search and select the ormserver user that you created in Step 3 of Section 5.7.2, then move it to the Selected list by clicking the right arrow and then click OK.
6. In the Security role to user/group mapping page, click OK.
7. In the Detail Properties section, click User RunAs roles.
8. Perform the following substeps:
   a. In the User Name field, type the User ID that you created in Step 3 of Section 5.7.2.
   b. In the password field, type the password that you created in Step 3 of Section 5.7.2.
   c. In the Role(s) field, select ORMServer.
9. Click Apply, and then click OK.
10. Restart the server or cluster on which Oracle Role Manager is installed.
11. To test the server installation, ensure that you can get to the Oracle Role Manager administrative console from a Web browser. For example:

http://localhost:9080/ormconsole

You should see the Home page of the Oracle Role Manager administrative console.

5.11.2 Deploying the Oracle Role Manager Web Application

To deploy the Oracle Role Manager Web application:

1. Go to Applications, Install New Application.

2. Select Remote file system, click Browse to navigate to the ORM_HOME/webui/webSphere/6.1 directory, select webui.ear, click OK and then click Next.

3. On the Select installation options page, accept the defaults and then click Next.

4. On the Map modules to servers page, perform the following substeps:
   a. From the Clusters and Servers list, select the server or cluster on which Oracle Role Manager is to be deployed.
   b. Select the webui module.
   c. Click Apply.
   d. Click Next.

5. Click Finish, and then save your changes.

6. Go to Applications, Enterprise Applications, ORM Web UI.

7. Click Manage Modules.

8. Click the webui link.

9. In the Class loader order list, select Classes loaded with application class loader first and apply.

10. From Applications, Enterprise Applications, select ORM Web UI, and then click Start.
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(This assumes you are administering WebSphere on the same server as the ORM Web UI is installed).

---

**Note:** If Web UI is deployed on a non-administrative server or cluster, then restart that server or cluster.

---

11. Test the Web application installation as follows:

   a. In a Web browser, navigate to the Oracle Role Manager Web application address. For example:

      `http://localhost:9080/webui`

   b. Log in as the Oracle Role Manager Administrator created in Section 3.3, "Installing Role Manager."

      You should see the Home page of the Oracle Role Manager Web application.
This chapter includes the following sections:

- Configuring JBoss Server in a Nonclustered Mode
- Configuring JBoss in a Clustered Mode
- Encrypting the Role Manager Database Password

6.1 Configuring JBoss Server in a Nonclustered Mode

This procedure assumes that JBoss is installed on the application server host for Role Manager.

You must configure JBoss server in SSL mode to operate in a secure environment. For information about configuring SSL for JBoss server, refer to the following URL:


To configure JBoss for Role Manager

1. Copy the orm-ds.xml and orm-service.xml files from:

   ORM_HOME/samples/jboss/4.2.3

   to the JBoss server where you want to deploy Role Manager. For example:

   JBOSS_HOME/server/default/deploy

2. Set the session ID to false in the following path:

   JBOSS_HOME/server/default/deploy/jboss-web.deployer/server.xml file

   setting emptySessionPath="false" for the HTTP/1.1 Connector

   For example:

   <Connector port="8080" address="${jboss.bind.address}"
              maxThreads="250" maxHttpHeaderSize="8192"
              emptySessionPath='true' protocol='HTTP/1.1'
              enableLookups='false' redirectPort='8443' acceptCount='100'
              connectionTimeout='20000' disableUploadTimeout='true' />

3. Set the JTA transaction timeout parameter by performing the following steps:

   a. Open the jboss-service.xml file from the following path:

      JBOSS_HOME/server/default/conf/jboss-service.xml file
b. Locate the configuration for mbean with the name, "mbean
code=com.arjuna.ats.jbossatx.jta.TransactionManagerService".

c. Change the TransactionTimeout attribute value to 1200:

```
<attribute name="TransactionTimeout">1200</attribute>
```

4. Encrypt the password of the Role Manager application user defined in Section 6.3.

```
Note: For more information about the JBoss Application Server, refer
to the following link:
http://www.jboss.org/docs/
```

5. Edit the orm-ds.xml file as follows:

a. Change the two occurrences of connection-url to match your database
environment:

```
<connection-url>jdbc:oracle:thin:@//SERVER_NAME:PORT/SERVICE_NAME</connection-url>
```

b. Change the two occurrences of user-name and password to match the
credentials of the Role Manager application user and password:

```
<user-name>USER_NAME</user-name>
<password>PASSWORD</password>
```

6. Copy the server.ear file from ORM_HOME/lib to the JBoss directory used above.

7. Copy the webui.war file from ORM_HOME/webui/jboss/4.2.3 to the JBoss
directory used above.

8. If JBoss is not already running, start the JBoss server using the following
command:

**For UNIX:**

```
JBOSS_HOME/bin/run.sh
```

**For Windows:**

```
JBOSS_HOME\bin\run.bat
```

9. To test the server installation, ensure that you can get to the Role Manager
administrative console from a Web browser. For example:

```
http://localhost:8080/ormconsole
```

10. To test the Role Manager Web application installation:

a. In a Web browser, navigate to the Role Manager Web UI. For example:

```
http://localhost:8080/webui
```
6.2 Configuring JBoss in a Clustered Mode

This section includes the following topics:

- Installing Oracle Role Manager
- Configuring JBoss Server on the First Node
- Setting Up the Network
- Copying Oracle Role Manager to Additional JBoss Application Server Nodes
- Setting Up JMS on JBoss
- Modifying server.ear
- Creating finalization-server.ear
- Modifying webui.war
- Starting the JBoss Application Server on the First Node
- Copying and Starting Additional JBoss Server Nodes

Caution: Deploying an application in a clustered installation is a complex procedure. This document assumes that you have expertise in installing and using applications in a JBoss Application Server cluster. These instructions provide the Oracle Role Manager-specific details only. They are not complete instructions for setting up a JBoss Application Server cluster. For more information about clustering, see JBoss Application Server documentation.

6.2.1 Installing Oracle Role Manager

Follow the installation steps for Oracle Role Manager in Section 3.3, “Installing Role Manager,” or Section 3.4, “Performing a Silent Installation Using a Response File” to install Oracle Role Manager.

6.2.2 Configuring JBoss Server on the First Node

To configure JBoss server on the first node:

1. Copy the orm-service.xml file from `ORM_HOME/samples/jboss/4.2.3` to `JBOSS_HOME/server/all/deploy-hasingleton/jms`.
2. Copy the orm-ds.xml file from `ORM_HOME/samples/jboss/4.2.3` to `JBOSS_HOME/server/all/farm`.
3. Edit the orm-ds.xml file as follows:

   b. Log in as the Role Manager Administrator created in Section 3.3, "Installing Role Manager."

   You should see the Home page of the Role Manager Web application.

   Note: Data must be loaded into the system to expose all the functionality of the application. Refer to Section 7.2, “Loading Sample Data,” for instructions.
a. Change the two occurrences of connection-url to match your database environment:

   `<connection-url>jdbc:oracle:thin:@//SERVER_NAME:PORT/SERVICE_NAME</connection-url>`

b. Change the two occurrences of user name and password to match the credentials of the Role Manager application user with the newly encrypted password:

   `<user-name>USER_NAME</user-name>`
   `<password>PASSWORD</password>`

4. Copy the `server.ear` file from `ORM_HOME/lib` to `JBOSS_HOME/server/all/farm`.

5. Copy the `webui.war` file from `ORM_HOME/webui/jboss/4.2.3` to `JBOSS_HOME/server/all/farm`.

6. Configure Cluster Name to DefaultPartition on `jboss-service.xml` of `JBOSS_HOME/server/all/deploy/jboss-web-cluster.sar/META-INF`.

### 6.2.3 Setting Up the Network

**To set up the network for cluster:**

1. Use IPv4 to ensure that you specify `-Djava.net.preferIPv4Stack=true`, otherwise JGroups might not start up.

2. Explicitly specify the network interface. On servers with multiple NICs, ensure that you select a specific NIC, otherwise JGroups may not be able to select a unique address for each node in the cluster.

3. Check firewalls to ensure firewalls and switches allow multi-cast IP on the server LAN.

4. Check for proper broadcast address to ensure the broadcast address is set properly on the NICs. Broadcast addresses are generally, `x.y.z.255` where `x.y.z` is the subnet address.

5. All NICs used for the JBoss cluster should have the same broadcast address.

### 6.2.4 Copying Oracle Role Manager to Additional JBoss Application Server Nodes

**Note:** You must ensure that the name and path of the `JAVA_HOME` directory used by Oracle Role Manager is same across all nodes of the cluster. For each additional node in your JBoss Application Server cluster, copy the JBoss and Oracle Role Manager installation directories from the first node to all other nodes, ensuring to maintain the original directory structure and hierarchy throughout this process.

#### 6.2.4.1 TCP Based Clustering

JBoss can be configured to use TCP or UDP based clustering. By default, JBoss is configured for UDP. For more information about UDP based clustering, refer to the JBoss Clustering guide available at:

TCP uses unicast messages to communicate with other nodes whereas UDP uses multicast messages over the network. If there are more than 2 nodes in the cluster then TCP would cause increased network traffic. If your internal network policy does not allow UDP, then TCP is needed. If you are on Windows, change UDP element's attribute loopback to true.

For using TCP based clustering to automatically detect a node in a multi-homed JBoss setup, modify the configuration file, cluster-service.xml located in JBOSS_HOME/server/all/deploy as follows:

1. Comment out the following UDP section to use a multicast group for the cluster communication:

```xml
<Config>
  <UDP mcast_addr='${jboss.partition.udpgroup:228.1.2.3}' mcast_port='45566' ip_ttl='${jgroups.mcast.ip_ttl:8}' ip_mcast='true' mcast_recv_buf_size='2000000' mcast_send_buf_size='6400000' ucast_recv_buf_size='2000000' ucast_send_buf_size='6400000' loopback='true'/>
  <PING timeout='2000' num_initial_members='3' up_thread='true' down_thread='true'/>
  <MERGE2 min_interval='10000' max_interval='20000'/>
  <FD_SOCK down_thread='false' up_thread='false'/>
  <FD shun='true' up_thread='true' down_thread='true' timeout='10000' max_tries='5'/>
  <VERIFY_SUSPECT timeout='3000' num_msgs='3' up_thread='true' down_thread='true'/>
  <pbcast.NAKACK gc_lag='50' retransmit_timeout='300,600,1200,2400,4800' max_xmit_size='8192' up_thread='true' down_thread='true'/>
  <UNICAST timeout='300,600,1200,2400,4800' window_size='100' min_threshold='10' down_thread='true'/>
  <pbcast.STABLE desired_avg_gossip='20000' max_bytes='4000000' up_thread='true' down_thread='true'/>
  <FRAG frag_size='8192' down_thread='true' up_thread='true'/>
  <pbcast.GMS join_timeout='5000' join_retry_timeout='2000' shun='true' print_local_addr='true'/>
  <pbcast.STATE_TRANSFER up_thread='true' down_thread='true'/>
</Config>
```

2. Uncomment the following section to use a TCP stack:

```xml
<Config>
  <TCP bind_addr='THISHOST' start_port='7800' loopback='true' recv_buf_size='2000000' send_buf_size='6400000' tcp_nodelay='true' up_thread='false' down_thread='false'/>
  <TCP_ping initial_hosts='THISHOST[7800],OTHERHOST[7800]' port_range='3' timeout='3500' num_initial_members='3' up_thread='false' down_thread='false'/>
  <MERGE2 min_interval='5000' max_interval='10000' up_thread='false' down_thread='false'/>
  <FD_SOCK down_thread='false' up_thread='false'/>
  <FD shun='true' up_thread='false' down_thread='false' timeout='10000' max_tries='5'/>
  <VERIFY_SUSPECT timeout='1500' down_thread='false' up_thread='false'/>
  <pbcast.NAKACK up_thread='false' down_thread='false' gc_lag='100' retransmit_timeout='300,600,1200,2400,4800'/>
  <pbcast.STABLE desired_avg_gossip='20000' max_bytes='4000000' up_thread='false' down_thread='false'/>
  <pbcast.GMS join_timeout='5000' join_retry_timeout='2000' shun='true' print_local_addr='true'/>
</Config>
```
3. Replace **THISHOST** and **OTHERHOST** with the IP addresses of the hosts in the cluster.

4. Add additional **OTHERNODE** entries as needed to support additional cluster members.

5. If you are using TCP, then change the 3 multicast ports from 7800 to 45777 (this port change avoids warnings about discarded message from another partition, because the Tomcat-DefaultPartition now uses another set of ports).

6. When you copy **cluster-service.xml** to **JBOSS_HOME/server/all/deploy** on other cluster nodes, remember to modify **THISHOST** with the IP address of the node.

### 6.2.5 Setting Up JMS on JBoss

**To set up JMS on JBoss:**

1. Copy the **ORM_HOME/lib/ojdbc14.jar** file to **JBOSS_HOME/server/all/lib**.

2. Update the JBoss Persistence Manager service by performing the following steps.
   a. Copy **JBOSS_HOME/docs/examples/jms/oracle-jdbc2-service.xml** to **JBOSS_HOME/server/all/deploy-hasingleton/jms**.
   b. Modify the **oracle-jdbc2-service.xml** file to provide DefaultDS as the value for PersistenceManager:

```
<depends
  optional-attribute-name="ConnectionManager">jboss.jca:service=DataSourceBinding,name=DefaultDS</depends>
```

   c. Delete the **deploy-hasingleton/jms/hsqldb-jdbc2-service.xml** file
   d. Delete the **JBOSS_HOME/server/all/farm/hsqldb-ds.xml** file.

3. Deploy the data source descriptor for your database by renaming
   **JBOSS_HOME/server/all/deploy-hasingleton/jms/hsqldb-jdbc-state-service.xml** to **oracle-jdbc-state-service.xml** and provide **DefaultDS** as the value for Connection Manager:

```
<depends
  optional-attribute-name="ConnectionManager">jboss.jca:service=DataSourceBinding ,name=DefaultDS</depends>
```

4. Navigate to **JBOSS_HOME/server/all/deploy/jms**, open **hajndi-jms-ds.xml** and change the bind address to IP or DNS hostname of the machine.

   For Example:

```
java.naming.provider.url=${jboss.bind.address:192.168.1.25}:1100
```

5. Navigate to **JBOSS_HOME/server/all/farm**, open **orm-ds.xml** and include the following block and change the url, username, password at two places:

```
<no-tx-datasource>
  <jndi-name>DefaultDS</jndi-name>
```

```
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<!-- Oracle version: replace SERVER_NAME and SERVICE_NAME -->
<driver-class>oracle.jdbc.OracleDriver</driver-class>
<connection-url>jdbc:oracle:thin://
SERVER_NAME:port_no/service_name</connection-url>

<exception-sorter-class-name>org.jboss.resource.adapter.jdbc.vendor.OracleExceptionSorter</exception-sorter-class-name>

<!-- Authentication: replace USER_NAME and PASSWORD -->
<User-name>username</User-name>
<password>password</password>

<!-- To set the database authentication in a secure form (i.e. not clear text) refer to the Oracle Role Manager installation guide. -->

<check-valid-connection-sql>select 1 from model</check-valid-connection-sql>

<!-- The minimum connections in a pool/sub-pool. Pools are lazily constructed on first use -->
<min-pool-size>5</min-pool-size>

<!-- The maximum connections in a pool/sub-pool -->
<max-pool-size>50</max-pool-size>

<!-- this will be run before a managed connection is removed from the pool for use by a client -->
<check-valid-connection-sql>select count(model_id) from model</check-valid-connection-sql>
</no-tx-datasource>

<local-tx-datasource>
    <jndi-name>DefaultXADS</jndi-name>
    <!-- Oracle version: replace SERVER_NAME and SERVICE_NAME -->
    <driver-class>oracle.jdbc.OracleDriver</driver-class>
    <connection-url>jdbc:oracle:thin://
    SERVER_NAME:port_no/service_name</connection-url>

    <exception-sorter-class-name>org.jboss.resource.adapter.jdbc.vendor.OracleExceptionSorter</exception-sorter-class-name>

    <!-- Authentication: replace USER_NAME and PASSWORD -->
    <User-name>username</User-name>
    <password>password</password>

    <!-- To set the database authentication in a secure form (i.e. not clear text) refer to the Oracle Role Manager installation guide. -->

    <check-valid-connection-sql>select 1 from model</check-valid-connection-sql>

    <!-- The minimum connections in a pool/sub-pool. Pools are lazily constructed on first use -->
    <min-pool-size>5</min-pool-size>

    <!-- The maximum connections in a pool/sub-pool -->
 Configuring JBoss in a Clustered Mode

<max-pool-size>50</max-pool-size>
</!-- this will be run before a managed connection is removed from the
pool for use by a client-->
<check-valid-connection-sql>select count(model_id) from
model</check-valid-connection-sql>
<metadata>
	<type-mapping>Oracle9i</type-mapping>
</metadata>
</local-tx-datasource>

6.2.6 Modifying server.ear

The server.ear file, supplied in the lib directory in the Oracle Role Manager
installation directory needs the additional files and modifications to configuration files
in order to work properly in a clustered server environment.

To modify server.ear:

1. Using a utility such as WinZip or jar, extract the contents of server.ear (located
ORM_HOME/lib) into temporary directory.

Within the extracted server.ear directory, you should see two additional
application archives, server.jar and ormconsole.war.

2. Extract the contents of server.jar and ormconsole.war into two different
temporary directories.

3. Modify the contents of server.jar as follows:

   a. Navigate to the root directory of the expanded server.jar in the temporary
   location.

   You should see two directories, META-INF and oracle.

   b. In this root directory, create a file named jndi.properties file with the
   following contents:

      java.naming.factory.initial=org.jnp.interfaces.NamingContextFactory
      java.naming.factory.url.pkgs=org.jboss.naming:org.jnp.interfaces
      java.naming.provider.url=jnp://orm_node1_ip_address:1100,
      orm_node2_ip_address:1100/

   Note: If JBoss is getting bound to the DNS name, use the DNS name
   of the node instead of the IP address.

   c. In the META-INF directory open the ejb-jar.xml file with a text editor and
   remove the following four bean and transaction elements for BtFinisherEJB
   and BtFinisherMessageEJB:

      <entity id="Entity_1183672362011"

      ...     <display-name>Finalization Server Bean</display-name>
      ...     <ejb-name>BtFinisherEJB</ejb-name>
      ...     </entity>

      <message-driven id="MessageDriven_1183672362010"

      <description>Message bean for handling incoming business transaction
      finalizations</description>
      <display-name>Finalization Server Message Bean</display-name>
      <ejb-name>BtFinisherMessageEJB</ejb-name>
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...</message-driven>

</method>

<method>
  <ejb-name>BtFinisherEJB</ejb-name>
  <method-name>*</method-name>
</method>

<method>
  <ejb-name>BtFinisherMessageEJB</ejb-name>
  <method-name>*</method-name>
</method>

d. In the same location, open the jboss.xml file with a text editor and remove the following entries for BtFinisherEJB and BtFinisherMessageEJB:

<entity>
  <ejb-name>BtFinisherEJB</ejb-name>
  <jndi-name>ejb/BtFinisher</jndi-name>
</entity>

<message-driven>
  <ejb-name>BtFinisherMessageEJB</ejb-name>
  <destination-jndi-name>queue/orm/BtFinisherQueue</destination-jndi-name>
</message-driven>

e. Repackage the contents of server.jar.

The directory layout in server.jar should include the added file as follows:

jndi.properties
META-INF/
oracle/

4. Modify the contents of ormconsole.war as follows:

a. Navigate to the WEB-INF directory of the expanded ormconsole.war in the temporary location.

b. In the WEB-INF directory, create a file named jboss-web.xml with the following content:

```xml
<?xml version='1.0' encoding='UTF-8' ?>
<!DOCTYPE jboss-web PUBLIC "-//JBoss//DTD Web Application 2.3V2//EN" "http://www.jboss.org/j2ee/dtd/jboss-web_3_2.dtd">
<jboss-web>
  <replication-config>
    <replication-trigger>SET_AND_NON_PRIMITIVE_GET</replication-trigger>
    <replication-granularity>SESSION</replication-granularity>
  </replication-config>
</jboss-web>
```

c. Create a subdirectory in the WEB-INF directory named classes.

d. Copy the jndi.properties file created in Step 3b into the newly created classes directory.

e. Repackage the contents of ormconsole.war.

The directory layout in ormconsole.war should include the added files as follows:
5. Repackage the contents of server.ear, ensuring to include the both updated server.jar and ormconsole.war files.

The directory layout in server.ear should be as follows:

META-INF/
thirdparty/
server.jar

6. Copy server.ear to JBOSS_HOME/server/all/farm on all cluster nodes.

6.2.7 Creating finalization-server.ear

The finalization-server.ear file, must be created, configured, and deployed as an additional archive in order to work properly in a clustered server environment.

To create finalization-server.ear:

1. Make a copy of the repackaged server.jar file and name it finalization-server.ear.

2. Using a utility such as WinZip or jar, extract the contents of finalization-server.ear into temporary directory.

Within the extracted finalization-server.ear directory, you should see the server.jar file.

3. Navigate to the root directory of the expanded finalization-server.jar in the temporary location.

You should see two directories, META-INF and oracle.

4. In the META-INF directory open the ejb-jar.xml file with a text editor and edit the file to contain only the content as follows:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<ejb-jar version="2.1" id="EJBJar_1183672362010"
xmlns="http://java.sun.com/xml/ns/j2ee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
http://java.sun.com/xml/ns/j2ee/ejb-jar_2_1.xsd">
<enterprise-beans>
<session id="Session_1183672362010">
<description>The single source for the SubsystemRegistry for use by other beans</description>
<display-name>Singleton Bean</display-name>
<ejb-name>SingletonEJB</ejb-name>
<local-home>oracle.iam.rm.server_api.ejb.SingletonLocalHome</local-home>
<local>oracle.iam.rm.server_api.ejb.SingletonLocal</local>
<ejb-class>oracle.iam.rm.server_api.ejb.SingletonBean</ejb-class>
```
<session-type>Stateless</session-type>
<transaction-type>Container</transaction-type>
<resource-ref id="ResourceRef_118367236209">
  <res-ref-name>jdbc/server</res-ref-name>
  <res-type>javax.sql.DataSource</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362010">
  <res-ref-name>jdbc/serverxa</res-ref-name>
  <res-type>javax.sql.DataSource</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362012">
  <res-ref-name>jdbc/server</res-ref-name>
  <res-type>javax.sql.DataSource</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362013">
  <res-ref-name>jdbc/serverxa</res-ref-name>
  <res-type>javax.sql.DataSource</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362014">
  <res-ref-name>jms/topicConFac</res-ref-name>
  <res-type>javax.jms.TopicConnectionFactory</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362015">
  <res-ref-name>jms/loaderQueue</res-ref-name>
  <res-type>javax.jms.Queue</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-ref id="ResourceRef_1183672362016">
  <res-ref-name>jms/notification</res-ref-name>
  <res-type>javax.jms.Topic</res-type>
  <res-auth>Container</res-auth>
  <res-sharing-scope>Shareable</res-sharing-scope>
</resource-ref>
<resource-env-ref id="ResourceEnvRef_1183672362011">
  <resource-env-ref-name>jms/loaderQueue</resource-env-ref-name>
  <resource-env-ref-type>javax.jms.Queue</resource-env-ref-type>
</resource-env-ref>
<resource-env-ref id="ResourceEnvRef_1183672362012">
  <resource-env-ref-name>jms/notification</resource-env-ref-name>
  <resource-env-ref-type>javax.jms.Topic</resource-env-ref-type>
</resource-env-ref>
<security-identity>
  <description>The role to use for managing finalization server message delivery.</description>
  <run-as>
    <role-name>ORMServer</role-name>
  </run-as>
</security-identity>
</entity>
<description>An Entity Bean that is used to manage the "single commit server" model. Only one should ever exist at one time in a cluster.</description>

<display-name>Finalization Server Bean</display-name>
<ejb-name>BtFinisherEJB</ejb-name>

<local-home>oracle.iam.rm.temporal.impl.ejb.BtFinisherHome</local-home>
<ejb-class>oracle.iam.rm.temporal.impl.ejb.BtFinisherBean</ejb-class>
<persistence-type>Bean</persistence-type>
<prim-key-class>java.lang.String</prim-key-class>
<reentrant>false</reentrant>
<ejb-local-ref id="EJBLocalRef_1183672362014">
<ejb-ref-name>ejb/singleton</ejb-ref-name>
<ejb-ref-type>Session</ejb-ref-type>
</ejb-local-ref>
</entity>

<message-driven id="MessageDriven_1183672362010">
<description>Message bean for handling incoming business transaction finalizations</description>
<display-name>Finalization Server Message Bean</display-name>
<ejb-name>BtFinisherMessageEJB</ejb-name>
<ejb-class>oracle.iam.rm.temporal.impl.ejb.BtFinisherMessageBean</ejb-class>
<transaction-type>Container</transaction-type>
<message-destination-type>javax.jms.Queue</message-destination-type>
<ejb-local-ref id="EjbLocalRef_1183672362012">
<ejb-ref-name>ejb/BtFinisher</ejb-ref-name>
<ejb-ref-type>Entity</ejb-ref-type>
</ejb-local-ref>
</message-driven>
<container-transaction>
  <method>
    <ejb-name>BtFinisherEJB</ejb-name>
    <method-name>*</method-name>
  </method>
  <method>
    <ejb-name>BtFinisherMessageEJB</ejb-name>
    <method-name>*</method-name>
  </method>
  <trans-attribute>Required</trans-attribute>
</container-transaction>
</assembly-descriptor>
</enterprise-beans>
</ejb-jar>

5. In the same location, open the jboss.xml file with a text editor and edit the file to contain only the content as follows:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE jboss PUBLIC
 "-//JBoss//DTD JBOSS 4.0//EN"
 "http://www.jboss.org/j2ee/dtd/jboss_4_0.dtd">
<jboss>
  <enterprise-beans>
    <session>
      <ejb-name>SingletonEJB</ejb-name>
      <configuration-name>Singleton Stateless Session Bean</configuration-name>
      <resource-ref>
        <res-ref-name>jdbc/server</res-ref-name>
        <jndi-name>java:/ORMServerDS</jndi-name>
      </resource-ref>
      <resource-ref>
        <res-ref-name>jdbc/serverxa</res-ref-name>
        <jndi-name>java:/ORMServerXADS</jndi-name>
      </resource-ref>
      <resource-ref>
        <res-ref-name>jms/topicConFac</res-ref-name>
        <jndi-name>java:/JmsXA</jndi-name>
      </resource-ref>
      <resource-ref>
        <res-ref-name>jms/queueConnectionFactory</res-ref-name>
        <jndi-name>java:/JmsXA</jndi-name>
      </resource-ref>
      <resource-ref>
        <res-ref-name>ejb/BtFinisherConnectionFactory</res-ref-name>
        <jndi-name>java:/JmsXA</jndi-name>
      </resource-ref>
      <resource-ref>
        <res-ref-name>ejb/BtFinisherQueue</res-ref-name>
        <jndi-name>queue/orm/BtFinisherQueue</jndi-name>
      </resource-ref>
      <resource-env-ref>
        <resource-env-ref-name>jms/notification</resource-env-ref-name>
        <jndi-name>topic/orm/NotificationTopic</jndi-name>
      </resource-env-ref>
      <resource-env-ref>
        <resource-env-ref-name>jms/loaderQueue</resource-env-ref-name>
        <jndi-name>queue/orm/LoaderQueue</jndi-name>
      </resource-env-ref>
    </session>
  </enterprise-beans>
  <clustered>true</clustered>
</jboss>
```
<cluster-config>
  <partition-name>ORM_CLUSTER</partition-name>
</cluster-config>

<session>
<entity>
  <ejb-name>BtFinisherEJB</ejb-name>
  <jndi-name>ejb/BtFinisher</jndi-name>
</entity>
<message-driven>
  <ejb-name>BtFinisherMessageEJB</ejb-name>
</message-driven>
<destination-jndi-name>queue/orm/BtFinisherQueue</destination-jndi-name>
</session>
<enterprise-beans>
  <container-configurations>
    <container-configuration>
      <container-name>Singleton Stateless Session Bean</container-name>
      <call-logging>false</call-logging>
      <invoker-proxy-binding-name>stateless-rmi-invoker</invoker-proxy-binding-name>
      <container-interceptors>
        <interceptor>org.jboss.ejb.plugins.ProxyFactoryFinderInterceptor</interceptor>
        <interceptor>org.jboss.ejb.plugins.LogInterceptor</interceptor>
        <interceptor>org.jboss.ejb.plugins.SecurityInterceptor</interceptor>
        <interceptor>org.jboss.ejb.plugins.TxInterceptorCMT</interceptor>
        <interceptor>org.jboss.ejb.plugins.CallValidationInterceptor</interceptor>
        <interceptor transaction="Bean">org.jboss.ejb.plugins.StatelessSessionInstanceInterceptor</interceptor>
      </container-interceptors>
      <instance-pool>org.jboss.ejb.plugins.StatelessSessionInstancePool</instance-pool>
    </container-configuration>
  </container-configurations>
</enterprise-beans>
6. Repackage the contents of server.jar.

The directory layout in server.jar should be as follows:

- jndi.properties
- META-INF/
- oracle/

7. Navigate up one directory and then to finalization-server/META-INF.

You should see the application.xml file.

8. Open the application.xml file with a text editor and edit the file to contain only the content as follows:

```xml
<?xml version="1.0" encoding="UTF-8"?>
<application version="1.4" id="ORM_Finalization_Server"
xmlns="http://java.sun.com/xml/ns/j2ee"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://java.sun.com/xml/ns/j2ee
http://java.sun.com/xml/ns/j2ee/application_1_4.xsd">
<display-name>ORM Finalization Server</display-name>
<module id="server">
  <ejb>server.jar</ejb>
</module>
</application>
```

9. Repackage the contents of finalization-server.ear, ensuring to include the both updated server.jar and configuration files.

The directory layout in finalization-server.ear should be as follows:

- META-INF/
- thirdparty/
- server.jar

---

**Note:** The file ormconsole.war must not be present in the finalization-server.ear file. If it is, remove it and repackage the EAR file.

---

10. Copy the new finalization-server.ear file to JBOSS_HOME/server/all/deploy-hasingleton on all cluster nodes.

6.2.8 Modifying webui.war

The webui.war supplied in the webui/jboss/4.2.3 directory in the Oracle Role Manager installation directory needs the following additional configuration to work properly in a cluster.

**To modify webui.war:**

1. Using a utility such as WinZip or jar, extract the contents of webui.war (located ORM_HOME/webui/jboss/4.2.3) into temporary directory.

Within the extracted webui.war directory, you should see the WEB-INF directory.
2. In the WEB-INF directory, edit the jboss-web.xml file to add the replication configuration as shown in bold:

```xml
<?xml version='1.0' encoding='UTF-8' ?>
<!DOCTYPE jboss-web PUBLIC "-//JBoss//DTD Web Application 2.3V2//EN" "http://www.jboss.org/j2ee/dtd/jboss-web_3_2.dtd">
<jboss-web>
  <ejb-ref>
    <ejb-ref-name>ejb/server</ejb-ref-name>
    <jndi-name>ejb/orm/ServerEJB</jndi-name>
  </ejb-ref>
  <replication-config>
    <replication-trigger>SET_AND_NON_PRIMITIVE_GET</replication-trigger>
    <replication-granularity>SESSION</replication-granularity>
    <replication-field-batch-mode>true</replication-field-batch-mode>
  </replication-config>
</jboss-web>
```

3. Create a subdirectory in the WEB-INF directory named classes.

4. In this classes directory, create a file named jndi.properties file with the following content:

```plaintext
java.naming.factory.initial=org.jnp.interfaces.NamingContextFactory
java.naming.factory.url.pkgs=org.jboss.naming:org.jnp.interfaces
java.naming.provider.url=jnp://orm_node1_ip_address:1100,orm_node2_ip_address:1100/
```

---

**Note:** If JBoss is getting bound to the DNS name, use the DNS name of the node instead of the IP address.

---

5. Repackage the web.war file, ensuring it has the same layout as the previous web.war file.

6. Copy web.war to JBOSS_HOME/server/all/farm on all cluster nodes.

### 6.2.9 Starting the JBoss Application Server on the First Node

1. Navigate to the directory JBOSS_HOME/bin, and then run the following command:

   **On Microsoft Windows:**
   ```
   run -c all -b <bind_address> -Djboss.partition.name=ORM_CLUSTER
   ```

   **On UNIX:**
   ```
   /run.sh -c all -b <bind_address> -Djboss.partition.name=ORM_CLUSTER
   ```

2. Access the Administration console by opening a browser and pointing it to the following URL and verify that you can successfully create and update IT Roles, Business Roles, or Organizations:

   ```
   http://IP_address:portNo/webui
   ```
6.2.10 Copying and Starting Additional JBoss Server Nodes

**Note:** You must ensure that the name and path of the JAVA_HOME directory used by Oracle Role Manager is same across all nodes of the cluster. For each additional node in your JBoss Application Server cluster, copy the JBoss and Oracle Role Manager installation directories from the first node to all other nodes, ensuring to maintain the original directory structure and hierarchy throughout this process.

**To copy and start additional JBoss Server Nodes:**

1. If using TCP, edit cluster-service.xml in JBOSS_HOME/server/all/deploy on each cluster node and replace TCPPING initialhost with the IP address of the node.

2. Edit the JBOSS_HOME/server/all/deploy/jms/hajndi-jms-ds.xml file and change the bind address to the IP Address or DNS hostname of the machine. For example:
   ```
   java.naming.provider.url=${jboss.bind.address:192.168.1.25}:1100
   ```

3. Start JBoss Application Server on each node using the similar command as of the first node.

6.3 Encrypting the Role Manager Database Password

This section describes how to encrypt the Role Manager database password in JBoss application server deployments. Specifically, you must perform the following steps to manually encrypt a password, and then modify the orm-ds.xml and login-config.xml files so that they can access the encrypted form of the password instead of the clear text version.

**To encrypt the Role Manager database password:**

1. Open a console window and navigate to the JBOSS_HOME directory.

2. Stop the JBoss server.

3. Run one of the following commands to encrypt the Role Manager database password. In this command, replace password with the actual password that you want to encrypt.

   **For UNIX:**
   ```
   ```

   **For Windows:**
   ```
   java -cp "%JBOSS_HOME%/lib/jboss-jmx.jar;%JBOSS_HOME%/lib/jboss-common.jar;%JBOSS_HOME%/server/default/lib/jboss-jca.jar;%JBOSS_HOME%/server/default/lib/jbosssx.jar" org.jboss.resource.security.SecureIdentityLoginModule
   ```

   This command returns an encoded form of the password you specify. For example, the password Welcome1 is encoded as 3146f9cc50af66af8592078de921bc.
4. Highlight and copy the encoded password to paste later in the JBoss application policy element definitions.

5. Open the JBOSS_HOME/server/default/deploy/orm-ds.xml file in a text editor.

6. Delete the <user-name> and <password> elements from the <no-tx-datasource> element.

7. Add the following <security-domain> element to the end of the <no-tx-datasource> element:

   <security-domain>EncryptDBPassword</security-domain>

8. Delete the <user-name> and <password> elements from the <local-tx-datasource> element.

9. Add the following <security-domain> element to the end of the <local-tx-datasource> element:

   <security-domain>EncryptXADBPassword</security-domain>

10. Save and close the orm-ds.xml file.

11. Open the JBOSS_HOME/server/default/conf/login-config.xml file in a text editor.

12. Add the following to <application-policy> element at the end of the <policy> element while replacing datasource_username with the data source user name and encoded_password with the encoded password you copied in step 3:

   <application-policy name = "EncryptXADBPassword">
   <authentication>
      <login-module code = "org.jboss.resource.security.SecureIdentityLoginModule" flag = "required">
         <module-option name = "username">datasource_username</module-option>
         <module-option name = "password">encoded_password</module-option>
         <module-option name = "managedConnectionFactoryName">
            jboss.jca:service=LocalTxCM,name=ORMServerXADS
         </module-option>
      </login-module>
   </authentication>
   </application-policy>

   <application-policy name = "EncryptDBPassword">
   <authentication>
      <login-module code = "org.jboss.resource.security.SecureIdentityLoginModule" flag = "required">
         <module-option name = "username">datasource_username</module-option>
         <module-option name = "password">encoded_password</module-option>
         <module-option name = "managedConnectionFactoryName">
            jboss.jca:service=NoTxCM,name=ORMServerDS
         </module-option>
      </login-module>
   </authentication>
   </application-policy>

13. Save and close the login-config.xml file.
This chapter provides the information about the following sections:

- Loading Standard Roles
- Loading Sample Data
- Manual Data Model Deployment
- Configuring the DAR File Size

### 7.1 Loading Standard Roles

The standard Roles contains objects and attributes that are listed in the standard data model, which are required for the Web application of Oracle Role Manager to function as designed. See Table A-1 in the Appendix of *Oracle Role Manager User’s Guide* for a complete list of objects available in the standard data model of Oracle Role Manager.

**To load standard roles:**

1. If the application server on with Role Manager is deployed is not already running, start it.

2. In a Web browser, go to the Role Manager Administrative Console. For example, by default:
   - JBoss: `http://<host>:8080/ormconsole`
   - WebSphere: `http://<host>:9080/ormconsole`
   - WebLogic: `http://<host>:9001/ormconsole`

3. Type user name and password of the Role Manager Administrator previously defined in "Installing Role Manager" on page 3-4, and then click Log In.

4. Click Upload.

5. Click Browse.

6. Navigate to select the `standard_roles.dar` file found in `ORM_HOME/samples/sample_data`.

7. Click Load.

8. Click refresh until you see that all processes are finalized.
7.2 Loading Sample Data

The sample data contains sample roles and role definitions, persons, and organizations. See Chapter 3, "Working with System Roles" of Oracle Role Manager User’s Guide for more information about predefined system roles in the sample data.

To load standard and sample data:
1. If the application server on with Role Manager is deployed is not already running, start it.
2. In a Web browser, go to the Role Manager Administrative Console. For example, by default:
   - JBoss: http://<host>:8080/ormconsole
   - WebSphere: http://<host>:9080/ormconsole
   - WebLogic: http://<host>:9001/ormconsole
3. Type user name and password of the Role Manager Administrator previously defined in "Installing Role Manager" on page 3-4, and then click Log In.
4. Click Upload.
5. Click Browse.
6. Navigate to select the sample_data.dar file found in ORM_HOME/samples/sample_data.
7. Click Load.
8. Click refresh until you see that all processes are finalized.

Once the data load processes display as being finalized, you can go back to the Role Manager Web application and check the sample data.

Loading the sample data can take several minutes. While data is being loaded, you can click refresh to monitor progress.

7.3 Manual Data Model Deployment

If you change the standard configuration or standard data model, you need to run a command to deploy your customizations to the database and then load the standard and the sample data.

This procedure assumes you have already completed the following steps:

- A database instance has been created for Role Manager with the appropriate tablespaces. (Refer to "Database Setup" on page 3-1.)
- The Role Manager database owner and application user schemas have been created and contain no data. (Refer to "Creating the Role Manager Users" on page 3-3.)
- The database is accessible and the service on which Role Manager is installed is started.

To deploy model and configuration customizations:
1. If you have any custom configuration or data model customizations, create an archive file containing your customizations and append the file name with .car. For more information about custom configuration, refer to Oracle Role Manager
2. In ORM_HOME/config, if it does not exist, create a file named db.properties that contains the following two lines:

```
db.driverClass=oracle.jdbc.driver.OracleDriver
db.connection_string=jdbc:oracle:thin:@$HOST$:$PORT$:$SERVICE_NAME$
```

where:
- $HOST$ is the database host name
- $PORT$ is the database listener port
- $SERVICE_NAME$ is the database instance on which the Role Manager users were created

3. In a command window, navigate to ORM_HOME/bin.

4. Run the following command to deploy the configuration and data model and create the Role Manager Administrator:

**If you have no Integration Library (IL) customizations:**

```
deploy.bat "../config/oim_integration.car" orm-owner ormapp-user admin-user
```

where:
- **orm-owner** is the user name of the Oracle Role Manager database owner user/schema
- **ormapp-user** is the user name of the Oracle Role Manager application user/schema
- **admin-user** is the user name of the Oracle Role Manager system administrator

**If you have IL customizations:**

```
deploy.bat "<collection_of_cars>" <orm-owner> <ormapp-user> <admin-user>
```

where:
- **<collection_of_cars>** contains the relative paths and file names of all CAR files to deploy.

For example, in a customized deployment, the collection of CAR files on a UNIX-based system might be similar to:

```
"../config/configurations_custom.car:../config/oim_integration_custom.car"
```

- **orm-owner** is the user name of the Oracle Role Manager database owner user/schema
- **ormapp-user** is the user name of the Oracle Role Manager application user/schema
- **admin-user** is the user name of the Oracle Role Manager system administrator
7.4 Configuring the DAR File Size

By default the largest DAR file you can load is 10MB, loading a larger file results in an error. You can configure the maximum DAR file size using the following instructions.

To configure the DAR file size:
1. Edit the config file:

For UNIX-based systems:

```
JBOSS_HOME/bin/run.sh
```

For Windows systems:
2. Add the following argument to JAVA_OPTS:
-Doracle.iam.rm.loader.max_upload_size=<new_value>
This chapter describes the process of removing Oracle Role Manager software. It contains the following sections:

- **Removing Oracle Role Manager Software**
  This section describes general instructions for UNIX-based systems and Windows systems.

- **Removing the Oracle Role Manager Database**
  This section describes specific instructions for dropping the Oracle Role Manager database users/schemas.

### 8.1 Removing Oracle Role Manager Software

Use the following procedure to uninstall the Oracle Role Manager software:

1. Run the Oracle Universal Installer as follows:
   
   For UNIX-based systems, run the command from `$ORACLE_HOME/oui/bin`:
   
   ```
   ./runInstaller.sh -deinstall -silent REMOVE_HOMES="${$ORACLE_HOME}"
   ```
   
   For example,
   
   `$ORACLE_HOME/oui/bin/runInstaller.sh -deinstall -silent REMOVE_HOMES="/scratch/ORMHome_1"`
   
   For Windows systems, run the following command from `$ORACLE_HOME/oui/bin`:
   
   ```
   setup.exe -deinstall -silent REMOVE_HOMES="$ORACLE_HOME"
   ```
   
   For example,
   
   `ORACLE_HOME\oui\bin\setup.exe -deinstall -silent REMOVE_HOMES="C:\orm123"`

2. As an alternative for Windows systems, start Oracle Universal Installer from the **Start** menu. On the Welcome page, click **Deinstall Products** to bring up the Oracle Inventory screen.

   Select the Oracle home directory and the products that you want to remove by selecting the desired check boxes, then click **Remove**. The Confirmation window appears. Click **Yes** to remove the selected components.

   After the Oracle Role Manager components are removed from your system, the **Oracle Inventory** page appears without the removed components. Click **Close** to
close the Oracle Inventory page. Click Cancel to exit Oracle Universal Installer. Click Yes to confirm that you want to exit.

3. Clean up the old Oracle directories.

On systems where Oracle Role Manager is the only Oracle software installed, navigate to the directory for oracle, then remove the directory.

For UNIX-based systems, use the `rm -r` command.

Otherwise, delete the Oracle Role Manager home.

For UNIX-based systems, issue the following command to confirm there is no other Oracle home installed.

```
$ grep 'HOME NAME' OraInventory/ContentsXML/Inventory.xml
```

4. Remove the deployments of the Oracle Role Manager server and Web UI from the application server, as appropriate to the application server. For more information about cleaning up the application server deployments, refer to the corresponding application server documentation.

### 8.2 Removing the Oracle Role Manager Database

Use the following procedure to remove the Oracle Role Manager database:

1. As the Oracle SYSTEM user, use sqlplus or similar utility to perform the following tasks.

2. Ensure that there are no active sessions from users using the following commands:

   ```
   select sid, serial# from v$session where username = 'ORM_DB_OWNER';
   select sid, serial# from v$session where username = 'ORM_APP_USER';
   ```

3. Drop the Oracle Role Manager application user and the database owner using the following commands:

   ```
   drop user ORM_APP_USER cascade;
   drop user ORM_DB_OWNER cascade;
   ```

4. Drop the Oracle Role Manager tablespaces using the following commands.

   ```
   DROP TABLESPACE ORM_UNDO INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
   DROP TABLESPACE ORM_TEMP INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
   DROP TABLESPACE ORM_INDEX INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
   DROP TABLESPACE ORM_DATA INCLUDING CONTENTS AND DATAFILES CASCADE CONSTRAINTS;
   commit;
   ```
This chapter provides a detailed information about Oracle Role Manager upgrade process. It deals with upgrading to Oracle Role Manager release 10.1.4.2 from release 10.1.4.1 or release 10.1.4.1.1.

To upgrade to release 10.1.4.2 from release 10.1.4.1 or release 10.1.4.1.1, you must complete the following tasks:

- Installing the Oracle Role Manager in Install-Only Mode
- Creating a Back Up for Existing Database
- Configuring Oracle Role Manager Integration Library
- Re-applying Customization to Data Model Configurations
- Running the Upgrade Tool
- Upgrade Logging
- Verifying the Upgrade
- Re-Deploying New Binaries to J2EE Container

### 9.1 Installing the Oracle Role Manager in Install-Only Mode

You must run the installer in the install only mode. This is because Role Manager configuration is already existing and you are upgrading it to the latest configuration using the upgrade utility. Running the installer in the install only mode will deliver the latest files, configurations.car and standard.car and binaries, server.jar, server.ear, webui.ear to your environment. For information about running the Oracle Role Manager installer, refer "Installing Role Manager" on page 3-4.

The installer does not support overwriting an existing installation on the file system. You must provide an alternative file system path to the installer.

---

**Note:** The install and configure mode is not supported on existing dbowner/app user schema which has data, but it is supported only on new dbowner/app user schema which has no data. Therefore, to upgrade existing configuration, you must install Oracle Role Manager in the install-only mode.

---

### 9.2 Creating a Back Up for Existing Database

Use the export or backup utilities provided with the database to perform a complete backup of your production database.
Production database backup includes, but is not limited to, complete export or backup of the Oracle Role Manager release 10.1.4.1 or 10.1.4.1.1 database instance to ensure that the database can be restored to its original state, if required.

---

**Note:**
- You must shut down the J2EE server in which Oracle Role Manager is running (or all servers in case of a cluster) before running the database backup and the upgrade tool.
- Ensure that no other JDBC client is accessing the existing Oracle Role Manager database.

---

### 9.3 Configuring Oracle Role Manager Integration Library

If you have installed Oracle Role Manager Integration Library for Oracle Identity Manager, then you must configure the Integration Library to match the Oracle Role Manager version that you are going to install. For information about how to configure the Integration Library, refer to *Oracle Role Manager Integration Guide*.

### 9.4 Re-applying Customization to Data Model Configurations

If Oracle Role Manager setup has any customization to the data model configuration files such as `standard.xml` or `standard_permissions.xml`, then you must reapply the customized configuration to the latest data model configurations shipped with Oracle Role Manager 10.1.4.2. For more information about data model customization, refer to *Oracle Role Manager Developer’s Guide*.

---

**Note:**
- Re-applying customization is optional if the Oracle Role Manager setup does not have any customization to standard data model configurations and webui.
- Upgrade does not support upgrade of webui and datamodel customizations. These customizations must be applied manually.

---

### 9.5 Running the Upgrade Tool

The upgrade tool is a command line tool, which upon successful running, upgrades the existing Oracle Role Manager database to the latest one.

The upgrade tool will not upgrade the Oracle Role Manager software deployed to application servers, but only upgrade the data model and configurations in the database.

---

**Note:** You must not directly run the upgrade tool on production database. It must be run on staging environment, which is prepared from production database backup. Upon successful upgrade and acceptance testing in staging environment, this tool can be run on production database.

---

Running the upgrade tool provides the installation with the following details:
- Updated standard configurations
- Updated Oracle Role Manager Integration Library configurations
- Updated custom configurations

For more information about these configurations, refer to *Oracle Role Manager Integration Guide*.

**To run the upgrade tool:**

1. On the Oracle Role Manager installation host, navigate to `ORM_HOME/config` on the new ORM installation.
2. Ensure that the `db.properties` file in `ORM_HOME/config` contains the correct information for your database environment. If it does not, edit and add the following lines:

   ```
   db.driverClass=oracle.jdbc.driver.OracleDriver
   db.connection_string=jdbc:oracle:thin:@//$HOST$:$PORT$/$SERVICE$
   ``

   Where `$HOST$` is the database host name, `$PORT$` is the database listener port, and `$SERVICE$` is the database instance on which the existing Oracle Role Manager users/schemas were created.
3. Stop the Oracle Role Manager application server if it is running.
4. In a command window, navigate to `ORM_HOME/bin`.
5. Run the following command to deploy the configuration:

   ```
   upgrade.sh NEW_ORM_HOME ..\config\db.properties orm-app-user orm-owner
   admin-user 'collection_of_cars'
   ``

   Where:
   - `orm-app-user` is the user name of the Oracle Role Manager application user/schema
   - `orm-owner` is the user name of the Oracle Role Manager database owner user/schema
   - `admin-user` is the user name of the Oracle Role Manager System Administrator
   - `collection_of_cars` contains the relative paths and file names of CAR files to be deployed. This collection must be within quotes with a semicolon (`;`) used as the delimiter between CAR files.

   Example for default configurations upgrade:
   ```
   "..\config\standard.car"
   ```

   Example for customized configurations upgrade:
   ```
   "..\model_custom\datamodel_custom.car;..\model_custom\standard_custom.car;"
   ```

   Example for a customized Oracle Role Manager configurations and Integration Library configurations upgrade:
   ```
   ..\config\standard_custom.car;..\config\oim_integration_custom.car
   ```

6. At the prompt, type `Y` to confirm you want to proceed with the upgrade.
7. At the prompt, type the passwords for application user, database owner, and administrator. The command window displays messages about the progress of the upgrade. These messages are also recorded in the log file.

Refer "Upgrade Logging" on page 9-4 for examples of log messages.

Refer "Verifying the Upgrade" on page 9-4 for information about verifying that the upgrade was successful.

9.6 Upgrade Logging

The log files for upgrade, for example orm-upgrade-1.log, are generated under the logs folder of ORM_HOME. These log files contain details about the progress of upgrade tasks and failure or success reports for upgrade.

The following are the examples of log messages generated in the log file:

- New connection for orm_db_owner
- Current detected ORM version is 10.1.4.1
- Starting the Upgrade Task, clean up any objects in a hierarchy with multiple parents

9.7 Verifying the Upgrade

The upgrade log will contain following messages that can be used to determine if the upgrade has been started and completed successfully:

- Starting upgrade from version 10.1.4.1 to version 10.1.4.2
- Version table created Successfully
- Version table populated with version number 10.1.4.2
- Upgrade Completed Successfully.

In case the upgrade fails, then an Upgrade Exception with the failure details will be logged in the log file.

Fix the error accordingly and rerun the upgrade till it runs successfully. If required restore the database from the production database backup.

If you complete the upgrade successfully, then a table named VERSION_TABLE is created in the orm_OWNER database schema and the SOFTWARE_VERSION column of the table displays the latest Oracle Role Manager version.

9.8 Re-Deploying New Binaries to J2EE Container

To re-deploy new binaries to J2EE container:

1. If the server.ear and the webui.war file are already deployed into the J2EE container, undeploy them and re-deploy the latest ones again.

2. Start up the J2EE container/application server that hosts the Oracle Role Manager instance.

Note: If IL is configured, then you must start the upgraded Oracle Identity Manager instances.
3. If IL is configured for Oracle Identity Manager, then perform the acceptance testing including IL. If acceptance test passes on staging environment, then repeat the steps from 9.6 to 9.8 on production environment.

9.8.1 For WebLogic

To deploy the Role Manager server and Web applications for WebLogic, refer "Deploying Role Manager" on page 4-6.

9.8.2 For JBoss

To deploy the Role Manager server and Web applications for JBoss, refer "Configuring JBoss Server in a Nonclustered Mode" on page 6-1.

9.8.3 For WebSphere

To deploy the Role Manager server and Web applications for WebSphere, refer "Deploying the Oracle Role Manager Web Application" on page 5-26 and "Deploying the Oracle Role Manager Server" on page 5-25.
This chapter provides the detailed explanation about manual configuration of WebLogic server. Perform these steps only if you intend to configure the WebLogic server manually.

A.1 Creating a New Domain

To create a new domain:

1. Start the Configuration Wizard using the following command:

   **For Windows**
   
   Go to Start, Oracle WebLogic, WebLogic Server 11gR1, Tools, Configuration Wizard.

   **For UNIX:**
   
   a. Go to the WebLogic bin directory using the following command:
      
      ```bash
      cd BEA_HOME/wlserv_10.3/common/bin
      ```
   
   b. Start the configuration wizard using the following command:
      
      ```bash
      sh config.sh
      ```

   **Note:** These instructions assume that the installation is a default installation performed with WebLogic server.

2. In the Configuration Wizard:
   
   a. Select **Create a New WebLogic domain** and then click **Next**.
   
   b. Select Base this domain on an existing template and choose WebLogic server template, for example, `<WLS_HOME>\common\templates\domains\wls.jar` and click **Next**.
   
   c. The domain name and domain location are displayed by default. Click **Next**.
   
   d. Type the user name and the password, and then confirm the password for the domain. Click **Next**.
   
   e. On the left side of the window, select **Production Mode**.
A.2 Configuring Memory options

To configure memory options:

- For Microsoft Windows systems

  Edit the startManagedWebLogic.cmd script and specify memory options as follows:

  Follow the format:

  ```
  %JAVA_HOME%\bin\java %JAVA_VM% %MEM_ARGS% %JAVA_OPTIONS%
  ```

  Locate the following line:

  ```
  set JAVA_OPTIONS=%JAVA_OPTIONS% -XnoOpt
  ```

  Before this line, add the following if using Sun Java Virtual Machine (JVM):

  ```
  set MEM_ARGS=-Xms1280m -Xmx1280m -XX:PermSize=128m
  -XX:MaxPermSize=256m
  ```

  Add the following if using JRockit Java Virtual Machine (JVM):

  ```
  set MEM_ARGS=-Xms1280m -Xmx1280m
  ```

- For UNIX Systems

  Edit the startManagedWebLogic.sh script and specify memory options as follows:

  Locate the line that starts with the following:

  ```
  $JAVA_HOME/bin/java $JAVA_VM $MEM_ARGS $JAVA_OPTIONS
  ```

  If using Sun Java Virtual Machine (JVM), add the following line before this line:

  ```
  MEM_ARGS="-Xms1280m -Xmx1280m -XX:PermSize=128m
  -XX:MaxPermSize=256m"
  ```

Note:

- -XnoOpt is available only in JRockit.
- The -XnoOpt option turns off adaptive optimization and is required for stable Oracle Role Manager operation.
export MEM_ARGS
If using JRockit Java Virtual Machine (JVM), add the following line before this line:
MEM_ARGS="-Xms1280m -Xmx1280m"
export MEM_ARGS
JAVA_OPTIONS="$JAVA_OPTIONS -XnoOpt"
export JAVA_OPTIONS

A.3 Starting WebLogic Server

To start the Oracle WebLogic server:

For Microsoft Windows:
1. For WebLogic, go to Start, Oracle WebLogic, User Projects, Domain Name, and then click Start Admin Server for WebLogic Server Domain.
2. Log on to the WebLogic Server Administration Console by using your new account and by pointing a Web browser to the following URL:
   http://hostname:7001/console

For Linux:
1. Go to the WebLogic user_projects/domains directory, for example:
   cd BEA_HOME/user_projects/domains/
2. Go to the directory of the domain that you just created using the Configuration Wizard. For example, cd domain name.
3. Start the Oracle WebLogic server using the following command:
   sh startWebLogic.sh
4. Log on to the WebLogic Server Administration Console by using your new account and by pointing a Web browser to the following URL:
   http://hostname:7001/console

A.4 Configuring Machines

A machine is a host that runs a WebLogic Server instance. You can configure a machine using the WebLogic Server Administration Console.

To configure a machine:
1. Select Machines under Environment and then click New.
2. In the Name field, type a name for the machine.
3. In the Machine OS field, select the operating system.
4. Click OK.

To start the node manager:
Use the following steps to start the node manager:
1. Navigate to WebLogic_install_dir/server/bin
2. Run the `startNodeManager.cmd` command for Microsoft Windows.
3. Run the `startNodeManager.sh` command for Linux.

### A.5 Configuring Servers

**Note:** WebLogic server must be already installed on which Role Manager application is configured.

The server is the machine that hosts the application. Use the following steps to configure a server in the WebLogic Server Administration Console:

**To configure a server:**
1. Select Servers under Environment and then click New.
2. In the Server Name field, type the name of the Role Manager server, for example ORMServer.
3. In the Server Listen Address field, type the IP address of the server.
4. In the Server Listen Port field, type the Role Manager listening port number.
5. Specify whether the server should belong to a cluster.
6. Click Next. Review your choices and then click Finish.

**To assign a machine to the server:**
1. Click the newly created server from the table of servers.
2. Click the Configuration tab and then click the General subtab.
3. In the Machine field, type the machine name.
4. Click Save.

**To start the server:**
1. Select Servers under Environment, and then click the newly created server from the table of servers.
2. Click the Control tab, then click the Start/Stop subtab.
3. Select ORMServer and then click Start.

### A.6 Setting Up Commons Logging

Setting up Commons Logging for Oracle Role Manager on WebLogic involves creating a new Log4j appender, adding jars to ORM_WLS_DOMAIN_HOME/lib and adding JAVA_OPTION in startManagedWebLogic.cmd for Microsoft Windows and startManagedWebLogic.sh for Linux.

**To Set Up Commons Logging:**
1. Create a new file, `log4j.properties` in ORM_WLS_DOMAIN_HOME for example, `BEA_HOME/user_projects/domains/orm_domain`:

```
log4j.rootLogger=debug, ORM
log4j.logger.oracle.iam.rm=debug
log4j.logger.oracle.iam.rm.persistence=INFO
```

---

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log4j.logger.org.springframework=INFO
log4j.logger.org.apache=WARN
log4j.logger.org.quartz=WARN

# Uncomment all these stdout lines if logs are desired on console
#log4j.appender.stdout=org.apache.log4j.ConsoleAppender
#log4j.appender.stdout.layout=org.apache.log4j.PatternLayout
#log4j.appender.stdout.layout.ConversionPattern=%5p [%d] %t %c (%F:%L) - %m%n
#log4j.appender.stdout.threshold=info

log4j.appender.ORM=org.apache.log4j.RollingFileAppender
log4j.appender.ORM.File=C:/bea/user_projects/domains/orm_domain/servers/ORMServer/logs/ORM.log
# Change the threshold to INFO for less verbose logging
log4j.appender.ORM.threshold=debug
log4j.appender.ORM.MaxFileSize=1024KB
# Keep backup files
log4j.appender.ORM.MaxBackupIndex=5
log4j.appender.ORM.layout=org.apache.log4j.PatternLayout
log4j.appender.ORM.layout.ConversionPattern=%5p [%d] %t %c (%F:%L) - %m%n

2. In the file ORM_WLS_DOMAIN_HOME/bin/startManagedWebLogic.cmd, add a new line after line 55:
@REM. Set JAVA_OPTIONS to the java flags that you want to pass to the vm.
set JAVA_OPTIONS=%JAVA_OPTIONS%
-Dlog4j.configuration=file:C:/bea/user_projects/domains/orm_domain/log4j.properties
Replace "C:/bea" with BEA_HOME.

3. Add the following jars into ORM_WLS_DOMAIN_HOME/lib folder:
   ■ commons-logging-1.0.4.jar (download from apache.org)
   ■ log4j-1.2.8.jar (download from apache.org)

4. Restart ORM WebLogic server and you see ORM debug messages in the log-file:
   BEA_HOME/user_projects/domains/orm_domain/servers/ORMServer/logs/ORMServer.log

A.7 Configuring JDBC Data Sources

To configure the non-XA data source:
1. In the Domain tree, select Services, JDBC, Data Sources.
2. Click New. The JDBC Data Source Properties page appears.
3. In the Name field, type the name of the data source, for example, ORM Data Source.
4. In the JNDI Name field, type the JNDI path:
   orm/jdbc/ORMServerDS
5. From the Database Type list, select Oracle.
6. From the Database Driver list, select Oracle's Driver (Thin).
7. Click Next and deselect Supports Global Transactions.
8. Click **Next**. The Connect Properties page appears.

9. In the **Database Name** field, type the name of the database, for example, *(Oracle SID)*.

10. In the **Host Name** field, type the host name or IP address of the machine hosting the database.

11. In the **Port** field, type the port number on which the database is listening, for example, 1521.

12. In the **Database User Name** field, type the database user name that was created in the Step 3 of the "Creating the Role Manager Users" on page 3-3 section.

13. In the **Password** field, type the password for the database user and in the **Confirm Password** field, retype the password.

14. Click **Next**. The Test Database Connection page appears.

15. Verify the contents.

16. Click **Next**. The Select Targets page appears.

17. Select **ORMServer** as the target and then click **Finish**.

**To configure the XA data source:**

1. In the Domain tree, select Services, JDBC, Data Sources.

2. Click **New**. The JDBC Data Source Properties page appears.

3. In the **Name** field, type the name of the data source, for example, **ORM XA Data Source**.

4. In the **JNDI Name** field, type the JNDI path:

   `orm/jdbc/ORMServerXADS`

5. From the Database Type list, select **Oracle**.

6. From the Database Driver list, select Oracle's Driver (Thin XA).

7. Click **Next**.

8. The Transaction Options page appears. Click **Next**.

9. In the **Database Name** field, type the name of the database, for example, *(Oracle SID)*.

10. In the **Host Name** field, type the host name or IP address of the machine hosting the database.

11. In the **Port** field, type the port number on which the database is listening, for example, 1521.

12. In the **Database User Name** field, type the database user name that was created in the Step 3 of the "Creating the Role Manager Users" on page 3-3 section.

13. In the **Password** field, type the password for the database user and in the **Confirm Password** field, retype the password.

14. Click **Next**. The Test Connection Database page appears.

15. Verify the contents.

16. Click **Next**. The Select Targets page appears.

17. Select **ORM server** as the target and then click **Finish**.
A.8 Configuring JMS Messaging Resources

To configure the JMS Server:
1. In the domain tree, select Services, Messaging, JMS Servers.
2. Click New. The JMS Server Properties page appears.
3. In the Name field, type the name of the Role Manager JMS Server, for example, ORM JMSServer.
4. Click Next. The Select targets page appears.
5. In the Target field, select ORMServer as the target and then click Finish.

To configure the JMS Module:
1. In the domain tree, select Services > Messaging > JMS Modules.
2. Click New. The Create JMS System Module page appears.
3. In the Name field, type the name of the Role Manager JMS module, for example, ORM JMSModule.
4. Click Next. The Target page appears.
5. In the Target field, select ORMServer as the target and then click Next.
6. Click Finish.

A.9 Configuring JMS Module Subdeployment

To configure JMS Module Subdeployment:
1. In the domain tree, select Services, Messaging, JMS Modules.
2. Click ORM JMSModule, for which you want to configure the subdeployment. Click the Subdeployments tab.
4. In the Name field, type the name of the subdeployment, for example, ORM JMSSubdeployment.
5. Click Next. The Target page appears.
6. Select ORM JMSServer as the JMS server target and then click Finish.

A.10 Configuring the JMS Connection Factory

To configure a JMS Connection Factory:
1. In the domain tree, select Services, Messaging, JMS Modules.

Note: If you are using RAC database, provide the following string while creating the data source:

```
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=host1-vip)(PORT=1521)) (ADDRESS=(PROTOCOL=TCP)(HOST=host2-vip)(PORT=1521)) (CONNECT_DATA=(SERVICE_NAME=orcl.us.oracle.com)))
```
2. Click ORM JMSModule.
3. Click New under Summary of Resources.
4. Select Connection Factory from the list of JMS resources.
5. Click Next. The Connection Factory Properties page appears.
6. In the Name field, type the name for the connection factory, for example, ORMConnectionFactory.
7. In the JNDI Name field, type the path for the connection factory, for example, orm/jms/ConnFac.
8. Click Next and then click Finish.
9. In the domain tree, select Services, Messaging, JMS Modules.
10. Click ORM JMSModule.
11. Click ORM ConnectionFactory.
12. Navigate to the Configuration tab, Transactions sub-tab.
13. Select the XA Connection Factory Enabled check box.
14. Click Save.

To configure a Finalization Connection Factory:
1. In the domain tree, select Services, Messaging, JMS Modules.
2. Click ORM JMSModule.
3. Click New under Summary of Resources.
4. Select Connection Factory from the list of JMS resources.
5. Click Next. The Connection Factory Properties page appears.
6. In the Name field, type the name for the connection factory, for example, Finalization ORM ConnectionFactory.
7. In the JNDI Name field, type the path for the connection factory, for example, orm/jms/FinalizationConFac.
8. Click Next, and then click Finish.
9. In the domain tree, select Services, Messaging, JMS Modules.
10. Click ORM JMSModule.
11. Click Finalization ORM ConnectionFactory.
12. Navigate to the Configuration tab, Transactions sub-tab.
13. Select the XA Connection Factory Enabled check box.
14. Click Save.

A.11 Configuring a Notification Topic

To configure a notification topic:
1. In the domain tree, select Services, Messaging, JMS Modules.
2. Click ORM JMSModule.
3. Click New under Summary of Resources.
4. Select **Topic** from the list of JMS resources.
5. Click **Next**. The JMS Destination Properties page appears.
6. In the **Name** field, type a name for the topic, for example, ORM NotificationTopic.
7. In the **JNDI Name** field, type the path for accessing the topic, for example, orm/topic/NotificationTopic.
8. In the **Template** field, select **None**.
9. Click **Next**.
10. Select **ORM JMSSubdeployment** that you created in the Step 4 of the “Configuring JMS Module Subdeployment” on page A-7 section from the list.
11. Click **Finish**.

### A.12 Configuring Queues

**To configure the ORM Finisher Queue:**
1. In the domain tree, select **Services, Messaging, JMS Modules**.
2. Click **ORM JMSModule**.
3. Click **New** under Summary of Resources.
4. Select **Queue** from the list of JMS resources.
5. Click **Next**. The JMS Destination Properties page appears.
6. In the **Name** field, type a name for the queue, for example, ORM FinisherQueue.
7. In the **JNDI Name** field, type the path for accessing the topic as orm/queue/BtFinisherQueue.
8. In the **Template** field, select **None**.
9. Click **Next**.
10. Select **ORM JMSSubdeployment** that you created in the Step 4 of the “Configuring JMS Module Subdeployment” on page A-7 section from the list.
11. Click **Finish**.

**To configure the ORM Loader Queue:**
1. In the domain tree, select **Services, Messaging, JMS Modules**.
2. Click **ORM JMSModule**.
3. Click **New** under Summary of Resources.
4. Select **Queue** from the list of JMS resources.
5. Click **Next**. The JMS Destination Properties page appears.
6. In the **Name** field, type a name for the queue, for example, ORM LoaderQueue.
7. In the **JNDI Name** field, type the path for accessing the topic as orm/queue/LoaderQueue.
8. In the **Template** field, select **None**.
9. Click **Next**.
10. Select **ORM JMSSubdeployment** that you created in the Step 4 of the “Configuring JMS Module Subdeployment” on page A-7 section from the list.

11. Click **Finish**.

**To configure the ORM Incoming Event Queue:**

1. In the domain tree, select **Services, Messaging, JMS Modules**.
2. Click **ORM JMSModule**.
3. Click **New** under Summary of Resources.
4. Select **Queue** from the list of JMS resources.
5. Click **Next**. The JMS Destination Properties page appears.
6. In the **Name** field, type a name for the queue, for example, **ORM IncomingEventQueue**.
7. In the **JNDI Name** field, type the path for accessing the topic as `orm/queue/IncomingEventQueue`.
8. In the **Template** field, select **None**.
9. Click **Next**.
10. Select **ORM JMSSubdeployment** that you created in the Step 4 of the “Configuring JMS Module Subdeployment” on page A-7 section from the list.
11. Click **Finish**.

**A.13 Configuring Data Upload Size Limit**

You can upload a DAR file to load data of maximum size 10 MB into the system. If you try to load data larger than this maximum upload size limit, you get an error message. You can configure the maximum data upload size limit to a higher or lower value than the default settings.

**To configure the data upload size limit:**

1. Go to Environment, Servers, ORM Server.
2. On the Configuration tab, click the **Server Start** subtab.
3. In the **Arguments** field, append the following argument to the new value.
   
   `-Doracle.iam.rm.loader.max_upload_size=<new value>`

   For example:
   
   `-Doracle.iam.rm.loader.max_upload_size=1073741824`

4. Click **Save**.

**A.14 Creating the Oracle Role Manager User**

Before installing the WebLogic server application, you must perform the following steps in the security realm:

1. Go to Security Realms and click the realm name, for example, **myrealm**.
2. Click **Users and Groups** and then **Users**.
3. Click **New** and then type the following details:
a. In the Name field, type ormserver.
b. In the Description field, type the description, for example, principal that acts as ORM Server.
c. In the Password field, type the password, for example, ormserver.

4. Click OK.

5. Click the newly created user, for example, ormserver.

6. To add the created user to the Administrators group:
   a. Go to the Groups tab.
   b. From the Available list, select Administrators.
   c. Click the right-pointing arrow.
   d. Click Save.

A.15 Deploying Role Manager

Click Deployment to deploy the Role Manager applications and perform the steps described in the "Deploying Role Manager" on page 4-6.
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