Oracle Identity Analytics Installation and Upgrade Guide

11*g* Release 1

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ORACLE

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Contents

Preface

About This Guide

This guide describes how to install Oracle® Identity Analytics software as well as how to upgrade from an older version of Sun Role Manager.

Who Should Read This Guide

This guide is intended for system administrators, system deployers, database administrators, and system integrators who need to install or upgrade the Oracle Identity Analytics software.

PART I

Compatibility Matrix

Part I is the compatibility matrix, which shows the products that the Oracle® Identity Analytics 11gR1 software supports.

◆ ◆ ◆ CHAPTER 1

Oracle Identity Analytics 11gR1 Compatibility Matrix

For the most up-to-date information about supported application servers, databases, web servers, and so on, see the platform certification matrix online:

http://www.oracle.com/technetwork/middleware/ias/downloads/fusion-certification-100350.html

Supported Languages

The Oracle Identity Analytics 11gR1 application supports the following languages:

- Spanish
- German
- French
- Korean
- Japanese
- English
- Simplified Chinese

PART II

Installing Oracle Identity Analytics

Part II contains instructions on how to install the Oracle Identity Analytics software.

◆ ◆ ◆ CHAPTER 2

Preparing to Install Oracle Identity Analytics

Architecture Overview

Oracle Identity Analytics is a Java 2 Platform, Enterprise Edition (J2EE platform) web application. The J2EE platform consists of a set of industry-standard services, APIs, and protocols that provide the functionality for developing multitiered, web-based, enterprise applications. The Oracle Identity Analytics system architecture is distributed across three logical tiers:

- The presentation tier
- The logic tier
- The data tier

The Oracle Identity Analytics application resides on an application server and the Oracle Identity Analytics central repository of application data resides on a database server.

Installing and Readying Your Application Server

For a list of supported application servers, see *Supported Application Servers* in the Oracle Identity Analytics 11gR1 Compatibility Matrix chapter.

Installing an Application Server

You can deploy Oracle Identity Analytics on any *supported application server*.

Configuring the Locale

The application server should be configured to use the same locale or encoding as the database and the Java Virtual Machine (JVM installation).

Inconsistent encodings can introduce certain globalization issues, such as the incorrect handling of multibyte characters. In globalized environments, UTF-8 should be implemented on all products.

Refer to your application server documentation for information about setting the locale and encoding.

Setting Up a Java Virtual Machine

A Java Virtual Machine (JVM) is required to run the Java classes that perform actions within Oracle Identity Analytics. At least a version 5.0 JDK or JRE is required to run Oracle Identity Analytics. To install Oracle Identity Analytics, however, you will need a JDK.

Note –

- Many application servers include JDK software bundled with their installation. The JDK version that is shipped with the application server is always preferred to any other JDK installed on your server.
- The JVM software should be configured to use the same locale or encoding as the application server and the database.

Configuring JVM Options

You should determine your memory need and set values in your application server's JVM accordingly.

The recommended memory settings are as follows:

```
-Xmx2048m -Xms2048m
```

Note –

- For a 32-bit system, Java heap size exceeding `1536MB` is not recommended.
- Depending on your specific implementation, you might need to increase these recommended values if you face performance issues with the web interface.

IPv4 is required by Oracle Identity Analytics for network communication. Refer to your operating system documentation for instructions on how to enable the IPv4 stack. Add the following JVM option to enforce the IPv4 preference over IPv6:

```
-Djava.net.preferIPv4Stack=true
```

Refer to your application server's documentation for information about configuring JVM options.

Configuring the RBACX_HOME Environment Variable

Before installing Oracle Identity Analytics you need to configure the RBACX_HOME environment variable. The RBACX_HOME variable should be permanently set to the directory where you will install Oracle Identity Analytics. To create a permanent environment variable, refer to your operating system documentation for instructions.

To temporarily set the $RBACX_HOME environment variable, type the following command at a command line. The $RBACX_HOME environment variable will remain valid for the length of your session.

Windows:

`set RBACX_HOME=`*Path to the Oracle Identity Analytics installation directory*

UNIX:

`export RBACX_HOME=`*Path to the Oracle Identity Analytics installation directory*

Note –

- A permanent $RBACX_HOME environment variable should be created under the application server's owner profile. Oracle Identity Analytics deployment will fail if RBACX_HOME is declared in a profile inaccessible by the application server.
- For a clustered deployment, the $RBACX_HOME environment variable needs to be created on every cluster member.

Installing and Readying Your Database Server

Preparing DB2

Prior to running the Oracle Identity Analytics installer, a blank database named `rbacx` and a user named `rbacxsvc` need to be created.

Note - If it is necessary to use a database name other than `rbacx` and a user name other than `rbacxservice`, open the schema creation script and replace all instances of the default database name and default user name with the names that you will be using instead. See Chapter 3, "Installing Oracle Identity Analytics," for more information.

To Create a Oracle Identity Analytics Database and Database User Account on DB2

Before You Begin - To create the database, you should have either `sysadm` or `sysctrl` privileges. Your DB2 database server should be installed and started.

1. Create the *rbacxservice* user on the target system as follows:

   Windows:

   Log in to the target system as an administrator, and type the following at a command prompt:

   ```
   C:\>net user rbacxservice rbacxservice /add
   ```

   UNIX:

   Log in to the target system as root or super user and type:

   ```
   # useradd rbacxservice
   ```

   ```
   # passwd rbacxservice
   ```

   When prompted, type `rbacxservice` as the password.

Preparing MySQL, MS SQL Server, and Oracle Database Server

Oracle Identity Analytics 11gR1 is preconfigured to use MySQL and MS SQL Server. No further steps are required to prepare MySQL or MS SQL Server for use with Oracle Identity Analytics.

For Oracle Database Server you may need to copy the JDBC driver JAR file (`ojdbc5.jar` or `ojdbc6.jar`, depending on which JDK you are using) into the appropriate location (`WEB-INF/lib` or your application server's global `lib` directory). See the next chapter for more information.

◆ ◆ ◆ CHAPTER 3

Installing Oracle Identity Analytics

Downloading Third-party Library Files

Third-party files need to be downloaded prior to upgrading. Downloaded files should be saved to a library folder, which will be referred to as `RM_LIB`. For example,

- **Windows**

  `mkdir C:\OIA_Lib`

  `set OIA_LIB=`*Path to the downloaded third-party library files* (e.g. `set OIA_LIB=C:\OIA_Lib`)

- **UNIX**

  `mkdir /opt/OIA_Lib`

  `export OIA_LIB=`*Path to the downloaded third-party library files* (e.g. `export OIA_LIB=/opt/OIA_Lib`)

The `jasper-jdt.jar` File

Download the `jasper-jdt.jar` file from this site:

`http://dlc.sun.com/rolemanager/Certification_And_Reporting/`

This file is required by the Oracle Identity Analytics certification and reporting feature.

JDBC Drivers

The JAR files for establishing a JDBC connection can be downloaded from this site:

`http://dlc.sun.com/rolemanager/Database_Drivers`

The JAR files that are required for each database type are summarized in the following table.

Database Type	File Name
IBM DB2	`db2jcc.jar, db2jcc_license_cu.jar`
Microsoft SQL Server	MS SQL Server jTDS JDBC driver is included in the Oracle Identity Analytics WAR file and does not need to be downloaded separately.
MySQL	MySQL drivers are included in the Oracle Identity Analytics WAR file and do not need to be downloaded separately.
Oracle	`ojdbc5.jar` if using JDK 1.5 / `ojdbc6.jar` if using JDK 1.6. The JDBC driver file you use needs to support both the JDK version you are running, as well as the backend Oracle DB instance version.

Note – Drivers for MS SQL Server (jTDS) and MySQL are bundled in the Oracle Identity Analytics WAR file. Do not install jTDS or MySQL drivers in the Oracle Identity Analytics `lib` directory.

Provisioning Server Connectivity Files

Depending on which third-party provisioning server you are using with Oracle Identity Analytics (CA eTrust, IBM Tivoli Identity Manager, or Oracle Identity Manager), you need to download the corresponding library files for that provisioning server. You do not need to download library files if you are using Sun Identity Manager as your provisioning server.

Download provisioning server connectivity files from this site:

http://dlc.sun.com/rolemanager/Provisioning_Server_Connectivity/

Installing Oracle Identity Analytics

Follow the procedure in this section to install Oracle Identity Analytics 11gR1.

To Create the Oracle Identity Analytics Folder Structure

Before You Begin - Prior to installing Oracle Identity Analytics, verify that the following prerequisites have been met:

- You should have installed your database and completed the steps in *Preparing Your Database* in the Chapter 2, "Preparing to Install Oracle Identity Analytics," chapter.

- If your database is installed on the same machine on which you are installing Oracle Identity Analytics, you should create an environment variable that maps to your database installation directory. For example, if you are using Oracle 10g, create an `$ORACLE_HOME` environment variable and map it to your Oracle installation directory.
- If installing on a UNIX® based system, you should have sufficient privileges to create and modify folders in the `/opt` directory of the file system.
- To execute the database schema on the target database, DBA privileges are required. Use `root` for MySQL, `system` for Oracle, `sa` for MS SQL Server, `db2admin` for DB2, or an account with equivalent privileges.

1. At a command prompt, type the following commands to create the necessary folder structure.
   - **Windows:**

     ```
     C:\> mkdir Oracle\OIA_11gR1
     ```

   - **UNIX:**

     ```
     $ mkdir -p /opt/Oracle/OIA_11gR1
     ```

2. Unpack the Oracle Identity Analytics installation package.
   - **Windows:**

     `unzip` *oia_install_package.zip* `-d OIA_11gR1`

   - **UNIX:**

     `unzip` *oia_install_package.zip* `-d OIA_11gR1`

3. Verify that the Oracle Identity Analytics folder structure was properly created.

   The directory that you installed Oracle Identity Analytics to should consist of the following folders and files.

   \| `.indexes` \| *folder* \|

`conf`	*folder*
`db`	*folder*
`rbacx.war`	*file*
`reports`	*folder*
`sample`	*folder*

Note – The `sample` folder contains `import` and `export` folders that show the folder structure recommended for file and ETL imports.

1. Copy the `import` and `export` folders (located in the `sample` folder) to `$RBACX_HOME`. The `import` and `export` folders should be at the same level as `conf`, `.indexes`, and `reports`.

Windows: To Create the Oracle Identity Analytics Schema on the Database Server

Before You Begin - Prior to creating the Oracle Identity Analytics schema on the Database Server, review the following:

- You should have created the Oracle Identity Analytics folder structure as described in the "Installing Oracle Identity Analytics" on page 20 section, earlier in this chapter.
- Oracle Identity Analytics utilizes an encrypted password when communicating with the database. To change the default database password, use the RBACx Encrypted Password Change Utility that is available from customer support.
- If it is necessary to use a database name other than `rbacx` and a user name other than `rbacxservice`, open the schema creation script and replace all instances of the default database name and default user name with the names that you will be using instead.

Go to the section that contains instructions for your database server.

Microsoft SQL Server

If SQL Server is installed locally, you can create the Oracle Identity Analytics schema using either the command prompt or the SQL Server Query Analyzer tool *or* the Management Studio tool. If SQL Server is not installed locally, use the SQL Server Query Analyzer tool or the Management Studio tool to create the schema.

- To create the schema and `rbacxservice` user from a command prompt, follow these steps:
  1. Navigate to `C:\Oracle\OIA_11gR1\db` by typing:

     ```
     C:\> cd Oracle\OIA_11gR1\db
     ```

  2. Run the following command(s) to execute the schema creation script:

     ```
     C:\> sqlcmd -S localhost -i rbacx-version_mssql_schema.sql -U sa -P password
     ```

- To create the schema using Query Analyzer or Management Studio, follow these steps:
  1. Log in to the database server as `sa`.
  2. Click the Open Query File menu and locate the `rbacx-`*version*`\mssql_schema.sql` file.
  3. Execute the SQL file.

     This will create the `rbacx` database on the server.

Oracle

You can create the Oracle Identity Analytics schema using either the command prompt or the Oracle iSQL Plus Web Console (available in Oracle 10g Database Server). If the Oracle Database Server is not installed locally, use the iSQL Plus Web Console to create the schema.

- To create the schema and `rbacxservice` user from a command prompt, follow these steps:
  1. Navigate to `C:\Oracle\OIA_11gR1\db` by typing:

     ```
     C:\> cd Oracle\OIA_11gR1\db
     ```

  2. Run the following command(s) to execute the schema creation script:

     ```
     C:\> sqlplus / as sysdba @rbacx-version_oracle_schema.sql
     ```

- To create the schema using the iSQL Plus Web Console, follow these steps:
  1. Open the following URL in a web browser.

     The default port for the iSQL Plus Web Console is `5560`.

     ```
     http://hostname:5560/isqlplus
     ```

  2. Select Load Script and browse to `C:\Oracle\OIA_11gR1\db`.
  3. Locate the file `rbacx-version_oracle_schema.sql` and click Load.

     The Oracle Identity Analytics schema creation script is loaded into the workspace window.
  4. Click Execute.

     The script is executed and the Oracle Identity Analytics schema is created on the system.

DB2

The following steps assume that the DB2 database server is installed locally. One of the following authorizations is required to create the database:

```
sysadm
```

```
sysctrl
```

To create the schema from a command prompt, follow these steps:

1. Create a database named `rbacx` by executing the following command as a DB2 administrator:

   ```
   C:\ db2cmd db2 CREATE DATABASE rbacx
   ```

2. Change directories to `C:\Oracle\OIA_11gR1\db`

   ```
   C:\> cd C:\Oracle\OIA_11gR1\db
   ```

3. Run the following command(s) to execute the schema creation script:

   ```
   C:\> db2cmd db2 -tvf rbacx-version_db2_schema.sql
   ```

MySQL

The following assumes that the MySQL database server is installed locally.

To create the schema from a command prompt, run the following command(s) to execute the schema creation script:

```
C:\> mysql --user=account --password=password < rbacx-version_mysql_schema.sql
```

Note – If you are using MySQL 5.0, the `lower_case_table_names` variable needs to be changed from its default value. Make the following change to `lower_case_table_names` in the MySQL configuration file.

```
lower_case_table_names=1
```

UNIX: To Create the Oracle Identity Analytics Schema on the Database Server

Before You Begin - Prior to creating the Oracle Identity Analytics schema on the Database Server, review the following:

- You should have created the Oracle Identity Analytics folder structure as described in the "Installing Oracle Identity Analytics" on page 20 section, earlier in this chapter.
- Oracle Identity Analytics utilizes an encrypted password when communicating with the database. To change the default database password, use the RBACx Encrypted Password Change Utility that is available from customer support.
- If it is necessary to use a database name other than `rbacx` and a user name other than `rbacxservice`, open the schema creation script and replace all instances of the default database name and default user name with the names that you will be using instead.

Oracle

You can create the Oracle Identity Analytics schema using either the command prompt or the Oracle iSQL Plus Web Console (available in Oracle 10g Database Server). If the Oracle Database Server is not installed locally under the `/opt` directory, use the iSQL Plus Web Console to create the schema.

- To create the schema and `rbacxservice` user from a command prompt, follow these steps:
  1. Type:

     ```
     $ su - oracle
     $ export ORACLE_HOME=/opt/oracle/product/10.2.0
     $ cd /opt/Oracle/OIA_11gR1/db
     ```

  2. Run the following command(s) to execute the schema creation script:

     ```
     $ sqlplus / as sysdba @rbacx-version_oracle_schema.sql
     ```

- To create the schema using the iSQL Plus Web Console, follow these steps:

1. Open the following URL in a web browser.

   The default port for the iSQL Plus Web Console is 5560.

   `http://`*hostname*`:5560/isqlplus`
2. Select Load Script and browse to `/opt/Sun/RM_5.0/db`.
3. Locate the file `rbacx-`*version*`_oracle_schema.sql` and click Load.

   The Oracle Identity Analytics schema creation script is loaded into the workspace window.
4. Click Execute.

   The script is executed and the Oracle Identity Analytics schema is created on the system.

DB2

The following steps assume that the DB2 database server is installed locally and that you are logged in as the `rbacxservice` user. One of the following authorizations is required to create the database:

```
sysadm

sysctrl
```

To create the schema using a terminal session, follow these steps:

1. Create a database named `rbacx` by executing the following command as a DB2 administrator:

   ```
   # db2 CREATE DATABASE rbacx
   ```
2. Change directories to `/opt/Oracle/OIA_11gR1/db`

   ```
   # cd /opt/Oracle/OIA_11gR1/db
   ```
3. Run the following command(s) to execute the schema creation script:

   ```
   # db2 -tvf rbacx-version_db2_schema.sql
   ```

MySQL

The following assumes that the MySQL database server is installed locally.

To create the schema from a terminal session, run the following command(s) to execute the schema creation script:

```
$ mysql --user=account --password=password < rbacx-version_mysql_schema.sql
```

Note – If you are using MySQL 5.0, the `lower_case_table_names` variable needs to be changed from its default value. Make the following change to the `lower_case_table_names` variable in the MySQL configuration file.

```
lower_case_table_names=1
```

To Configure Oracle Identity Analytics for Standalone Deployment

Follow these steps to build a custom `.war` file for your environment.

Before You Begin -

- Complete the steps in "Installing Oracle Identity Analytics" on page 20.
- An installed JDK is required (Version 1.5, at minimum).
- You should have downloaded the JDBC connectivity JAR file for your database. See *Downloading and Installing JDBC Drivers* in the Preparing to Install Oracle Identity Analytics chapter for more information.
- You should have created the Oracle Identity Analytics schema on the database server ("To Create the Oracle Identity Analytics Folder Structure" on page 20 and "Windows: To Create the Oracle Identity Analytics Schema on the Database Server" on page 22).

1. Create a backup copy of the original `rbacx.war` file.
   - **Windows:**

     ```
     C:\> cd C:\Oracle\OIA_11gR1
     C:\> mkdir rbacx_original
     C:\> copy rbacx.war rbacx_original
     ```

     A copy of the `rbacx.war` file is created under `C:\Sun\RM_5.0\rbacx_original`
   - **UNIX:**

     ```
     $ cd /opt/Oracle/OIA_11gR1
     $ mkdir rbacx_original
     $ cp rbacx.war rbacx_original/.
     ```

     A copy of the `rbacx.war` file is created under `/opt/Sun/RM_5.0/rbacx_original`
2. Create an `rbacx_staging` folder under `$RBACX_HOME`
   - **Windows:**

     ```
     C:> mkdir rbacx_staging
     C:> cd rbacx_staging
     ```

- **UNIX:**

  ```
  $ mkdir rbacx_staging
  $ cd rbacx_staging
  ```

3. Extract `rbacx.war` to `rbacx_staging` so that configuration changes can be made.
   - **Windows:**

     ```
     C:> jar -xvf ../rbacx.war
     ```

   - **UNIX:**

     ```
     $ jar -xvf ../rbacx.war
     ```

4. Navigate to `rbacx_staging/WEB-INF`
   - **Windows:**

     ```
     C:> cd WEB-INF
     ```

   - **UNIX:**

     ```
     $ cd WEB-INF
     ```

5. Update the `log4j.properties` file with the correct path for your environment.

   Note – If the Oracle Identity Analytics log file is going to be created in any folder other than the default log folder as defined by the application server, complete the step. Otherwise, skip and go to the next step.

   a. In a text editor, open the `log4j.properties` file located in the `WEB-INF` folder.
   b. Locate the following line under `# File Appender`

      ```
      log4j.appender.file.file=logs/rbacx.log
      ```

   c. Replace `logs/rbacx.log` with the full path to where the log file should be written.

      For example, the line should look like this:

      - **Windows:**

        ```
        log4j.appender.file.file=C:/Sun/RM_5.0/logs/rbacx.log
        ```

      - **UNIX:**

        ```
        log4j.appender.file.file=/opt/Sun/RM_5.0/logs/rbacx.log
        ```

6. Copy the downloaded third-party library files to the Oracle Identity Analytics library under the `WEB-INF/lib` directory
   - **Windows**

     ```
     copy %RM_LIB%
     * WEB-INF\lib
     ```

   - **UNIX**

```
cp $RM_LIB/* WEB-INF/lib
```

7. Make the following changes if there are multiple instances of Oracle Identity Analytics, standalone or clustered, on the same subnet.
   a. Navigate to `rbacx_staging/WEB-INF` directory.
   b. In a text editor, open `application-context.xml`, find bean id `commManager`, and examine the `constructor-arg` value.
   c. Set the `constructor-arg` value with a unique instance name, for example `value="SRM-Instance-1"`.
   d. In a text editor, open `search-context.xml`, find bean ID `searchConfiguration`, and examine the `constructor-arg` value.
      - The deployment is a standalone, `constructor-arg` defaults to a value of `0`, which is specified as `value="0"`.
   e. Navigate to `rbacx_staging/WEB-INF/classes` directory and do the following:
      i. In a text editor, open `oscache.properties` (located in the `rbacx_staging/WEB-INF/classes` directory), and find the `cache.cluster.multicast.ip` property.
      ii. Uncomment `cache.cluster.multicast.ip` by removing the `#` at the start of the line. Each Oracle Identity Analytics instance requires a unique `cache.cluster.multicast.ip` value.
8. Run the following commands from the `rbacx_staging` folder to repack the newly modified `rbacx.war` file.

   The expanded folder structure is repackaged to a `.war` file, which is required for deployment on the application server.

   - **Windows:**

     ```
     C:\> cd C:\OracleOIA_11gR1\rbacx_staging
     C:\> jar -cvfM ../rbacx.war .
     ```

     The new `rbacx.war` file is located in `C:\Sun\RM_5.0`.

   - **UNIX:**

     ```
     $ cd /opt/Oracle/OIA_11gR1/rbacx_staging
     $ jar -cvfM ../rbacx.war .
     ```

     The new `rbacx.war` file is located in `/opt/Sun/RM_5.0`.
9. Delete the `rbacx_staging` folder.
   - **Windows:**

     ```
     C:\> rmdir /s rbacx_staging
     ```

   - **UNIX:**

     ```
     $ /usr/bin/rm -r rbacx_staging
     ```

10. Copy the `jdbc.properties` file for your database to the Oracle Identity Analytics `conf` directory, located as follows.
    - **Windows:**

      `C:\>Oracle\OIA_11gR1\conf`
    - **UNIX:**

      `/opt/ Oracle/OIA_11gR1/conf`

      For example, to establish connectivity with MySQL, copy `jdbc.properties` from the `mysql` directory to the `conf` directory.
11. In a text editor, open the `jdbc.properties` file and edit the following lines, substituting `$SERVER_NAME` and `$PORT_NUMBER` with the host name and connectivity port of the target database.

    Oracle

    `# JDBC driver URL`

    `jdbc.url=jdbc:oracle:thin:@$`*`SERVER_NAME`*`:$`*`PORT_NUMBER`*`:rbacx`

    The default port number for JDBC connectivity on the Oracle server is `1521` and it is assumed that the default SID is `rbacx`.

    MS SQL Server

    `# JDBC driver URL`

    `jdbc.url=jdbc:jtds:sqlserver://$`*`SERVER_NAME`*`:$`*`PORT_NUMBER`*`/rbacx;tds=8.0;lastupdatecount=true`

    The default port number for JDBC connectivity on MS SQL Server is `1433`.

    DB2

    `# JDBC driver URL`

    `jdbc.url=jdbc:db2://$`*`SERVER_NAME`*`:$`*`PORT_NUMBER`*`/rbacx`

    The default port number for JDBC connectivity on DB2 is `50000`.

    MySQL

    `# JDBC driver URL`

    `jdbc.url=jdbc:mysql://$`*`SERVER_NAME`*`:$`*`PORT_NUMBER`*`/rbacx`

    The default port number for JDBC connectivity on MySQL Server is `3306`.
12. Do the following:
    a. Go to the following location and open `iam.properties` in a text editor.
       - **Windows:**

         `C:\>Oracle\OIA_11gR1\conf`
       - **UNIX:**

         `/opt/Oracle/OIA_11gR1/conf`

b. Edit the following lines, replacing `$RBACX_HOME` with the path to the directory where Oracle Identity Analytics is installed:

```
com.vaau.rbacx.iam.file.import.completeLocation=$RBACX_HOME/import/complete
com.vaau.rbacx.iam.file.import.schemaLocation=$RBACX_HOME/import/schema
com.vaau.rbacx.iam.file.import.dropLocation=$RBACX_HOME/import/in
com.vaau.rbacx.etl.import.dropLocation=$RBACX_HOME/import/etl/in
com.vaau.rbacx.etl.import.graphsLocation=$RBACX_HOME/import/etl/graphs
com.vaau.rbacx.etl.import.completeLocation=$RBACX_HOME/import/etl/complete
com.vaau.rbacx.etl.import.outputLocation=$RBACX_HOME/import/in
com.vaau.rbacx.iam.file.export.dropLocation=$RBACX_HOME/export/etl/in
com.vaau.rbacx.iam.file.export.schemaLocation=$RBACX_HOME/export/schema
com.vaau.rbacx.etl.export.dropLocation=$RBACX_HOME/export/etl/in
com.vaau.rbacx.etl.export.graphsLocation=$RBACX_HOME/export/etl/graphs
com.vaau.rbacx.etl.export.completeLocation=$RBACX_HOME/export/etl/complete
com.vaau.rbacx.etl.export.outputLocation=$RBACX_HOME/export/out
```

To Configure Oracle Identity Analytics for Clustered Deployment

Follow these steps to build a custom `.war` file for your environment.

Before You Begin -

- Complete the steps in "Installing Oracle Identity Analytics" on page 20.
- An installed JDK is required (Version 1.5, at minimum).
- You should have downloaded the JDBC connectivity JAR file for your database. See *Downloading and Installing JDBC Drivers* in the Preparing to Install Oracle Identity Analytics chapter for more information.
- You should have created the Oracle Identity Analytics schema on the database server ("To Create the Oracle Identity Analytics Folder Structure" on page 20 and "Windows: To Create the Oracle Identity Analytics Schema on the Database Server" on page 22).

1. Create a backup copy of the original `rbacx.war` file.
   - **Windows:**

     ```
     C:\> cd C:\{}{}Oracle{}\{}{}OIA_11gR1
     C:\> mkdir rbacx_original
     C:\> copy rbacx.war rbacx_original
     ```

     A copy of the `rbacx.war` file is created under `C:\Sun\RM_5.0\rbacx_original`
   - **UNIX:**

     ```
     $ cd /opt/ {}Oracle{}/ {}OIA_11gR1
     $ mkdir rbacx_original
     $ cp rbacx.war rbacx_original/.
     ```

     A copy of the `rbacx.war` file is created under `/opt/Sun/RM_5.0/rbacx_original`

2. Create an `rbacx_staging` folder under `$RBACX_HOME`
   - **Windows:**

     ```
     C:> mkdir rbacx_staging
     C:> cd rbacx_staging
     ```

   - **UNIX:**

     ```
     $ mkdir rbacx_staging
     $ cd rbacx_staging
     ```

3. Extract `rbacx.war` to `rbacx_staging` so that configuration changes can be made.
   - **Windows:**

     ```
     C:> jar -xvf ../rbacx.war
     ```

   - **UNIX:**

     ```
     $ jar -xvf ../rbacx.war
     ```

4. Navigate to `rbacx_staging/WEB-INF`
   - **Windows:**

     ```
     C:> cd WEB-INF
     ```

   - **UNIX:**

     ```
     $ cd WEB-INF
     ```

5. Update the `log4j.properties` file with the correct path for your environment.

   Note – If the Oracle Identity Analytics log file is going to be created in any folder other than the default log folder as defined by the application server, complete the step. Otherwise, skip and go to the next step.

   ---

   a. In a text editor, open the `log4j.properties` file located in the `WEB-INF` folder.
   b. Locate the following line under `# File Appender`

      ```
      log4j.appender.file.file=logs/rbacx.log
      ```

   c. Replace `logs/rbacx.log` with the full path to where the log file should be written.

      For example, the line should look like this:
      - **Windows:**

        ```
        log4j.appender.file.file=C:/Sun/RM_5.0/logs/rbacx.log
        ```

      - **UNIX:**

        ```
        log4j.appender.file.file=/opt/Sun/RM_5.0/logs/rbacx.log
        ```

6. Copy the downloaded third-party library files to the Oracle Identity Analytics library under the `WEB-INF/lib` directory

- **Windows**

  ```
  copy %RM_LIB%

  * WEB-INF\lib
  ```

- **UNIX**

  ```
  cp $RM_LIB/* WEB-INF/lib
  ```

7. Make the following changes to enable Oracle Identity Analytics 11gR1 support for clustered application server deployments.
   a. Navigate to the `rbacx_staging/WEB-INF` directory.
   b. In a text editor, open `application-context.xml`, find bean ID`commManager`, and examine the `constructor-arg` value.
   c. Set the `constructor-arg` value as the cluster name—for example, `value="Prod-1-Cluster"`.
      - If Oracle Identity Analytics is deployed on multiple clusters within the same subnet, you should define unique `constructor-arg` values for each deployment. For example, if both clusters `Prod-Cluster` and `QA-Cluster` have Oracle Identity Analytics deployed, the `constructor-arg` values of each should be set to `Prod-Cluster` and `QA-Cluster` respectively.
      - Members of the same cluster should have the same `constructor-arg` value.
   d. In a text editor, open `search-context.xml`, find bean ID `searchConfiguration`, and examine the `constructor-arg` value.

      If the deployment is a clustered deployment, `constructor-arg` defaults to a value of `1` or `2` depending on the location of the `.indexes` directory.

      To set the `constructor-arg` value, do the following:
      - If each clustered node will be accessing *local* individual `.indexes` directories, set `constructor-arg` to `1`. For example, `value="1"`
      - If clustered nodes will be accessing *a shared* `.indexes` directory, set `constructor-arg` to `2`. For example, `value="2"`. The `.indexes` directory needs to be located on an NFS share location where each clustered node has read-write permission. Edit `indexLocation` such that the NFS share location replaces `$RBACX_HOME` in the `value` field.
   e. If multiple instances of Oracle Identity Analytics standalone or clustered exist on the same subnet, navigate to the `rbacx_staging/WEB-INF/classes` directory and do the following:
      i. In a text editor, open `oscache.properties` (located in the `rbacx_staging/WEB-INF/classes` directory), and find the `cache.cluster.multicast.ip` property.
      ii. Uncomment `cache.cluster.multicast.ip` by removing the `#` at the start of the line. Each non-member instance requires a unique `cache.cluster.multicast.ip` value.

8. Run the following commands from the `rbacx_staging` folder to repack the newly modified `rbacx.war` file.

   The expanded folder structure is repackaged to a `.war` file, which is required for deployment on the application server.

   - **Windows:**

     ```
     C:\> cd C:\Oracle\OIA_11gR1\rbacx_staging
     C:\> jar -cvfM ../rbacx.war .
     ```

     The new `rbacx.war` file is located in `C:\Sun\RM_5.0`.

   - **UNIX:**

     ```
     $ cd /opt/Oracle/OIA_11gR1/rbacx_staging
     $ jar -cvfM ../rbacx.war .
     ```

     The new `rbacx.war` file is located in `/opt/Sun/RM_5.0`.

9. Delete the `rbacx_staging` folder.

   - **Windows:**

     ```
     C:\> rmdir /s rbacx_staging
     ```

   - **UNIX:**

     ```
     $ /usr/bin/rm -r rbacx_staging
     ```

10. Copy the `jdbc.properties` file for your database to the Oracle Identity Analytics `conf` directory, located as follows.

    - **Windows:**

      ```
      C:\> Oracle\OIA_11gR1\conf
      ```

    - **UNIX:**

      ```
      /opt/Oracle/OIA_11gR1/conf
      ```

      For example, to establish connectivity with MySQL, copy `jdbc.properties` from the `mysql` directory to the `conf` directory.

11. In a text editor, open the `jdbc.properties` file and edit the following lines, substituting `$SERVER_NAME` and `$PORT_NUMBER` with the host name and connectivity port of the target database.

    Oracle

    ```
    # JDBC driver URL
    jdbc.url=jdbc:oracle:thin:@$SERVER_NAME:$PORT_NUMBER:rbacx
    ```

    The default port number for JDBC connectivity on the Oracle server is `1521` and it is assumed that the default SID is `rbacx`.

    MS SQL Server

    ```
    # JDBC driver URL
    ```

```
jdbc.url=jdbc:jtds:sqlserver://$SERVER_NAME:$PORT_NUMBER/rbacx;
tds=8.0;lastupdatecount=true
```

The default port number for JDBC connectivity on MS SQL Server is `1433`.

DB2

```
# JDBC driver URL

jdbc.url=jdbc:db2://$SERVER_NAME:$PORT_NUMBER/rbacx
```

The default port number for JDBC connectivity on DB2 is `50000`.

MySQL

```
# JDBC driver URL

jdbc.url=jdbc:mysql://$SERVER_NAME:$PORT_NUMBER/rbacx
```

The default port number for JDBC connectivity on MySQL Server is `3306`.

12. Make the following change to `jdbc.properties` for clustered Quartz support, and save the file:

    ```
    jdbc.quartz.isClustered=true
    ```

13. Do the following:

    a. Go to the following location and open `iam.properties` in a text editor.

    - **Windows:**

      ```
      C:\>Oracle\OIA_11gR1\conf
      ```

    - **UNIX:**

      ```
      /opt/Oracle/OIA_11gR1/conf
      ```

    b. Edit the following lines, replacing `$RBACX_HOME` with the path to the directory where Oracle Identity Analytics is installed:

    ```
    com.vaau.rbacx.iam.file.import.completeLocation=$RBACX_HOME/import/complete
    com.vaau.rbacx.iam.file.import.schemaLocation=$RBACX_HOME/import/schema
    com.vaau.rbacx.iam.file.import.dropLocation=$RBACX_HOME/import/in
    com.vaau.rbacx.etl.import.dropLocation=$RBACX_HOME/import/etl/in
    com.vaau.rbacx.etl.import.graphsLocation=$RBACX_HOME/import/etl/graphs
    com.vaau.rbacx.etl.import.completeLocation=$RBACX_HOME/import/etl/complete
    com.vaau.rbacx.etl.import.outputLocation=$RBACX_HOME/import/in
    com.vaau.rbacx.iam.file.export.dropLocation=$RBACX_HOME/export/etl/in
    com.vaau.rbacx.iam.file.export.schemaLocation=$RBACX_HOME/export/schema
    com.vaau.rbacx.etl.export.dropLocation=$RBACX_HOME/export/etl/in
    com.vaau.rbacx.etl.export.graphsLocation=$RBACX_HOME/export/etl/graphs
    com.vaau.rbacx.etl.export.completeLocation=$RBACX_HOME/export/etl/complete
    com.vaau.rbacx.etl.export.outputLocation=$RBACX_HOME/export/out
    ```

Note – When the application server is clustered, the nodes can maintain localized import/export directories, or utilize import/export directories on a NFS share. If the nodes use a shared NFS location for import/export, substitute `$RBACX_HOME` with the path to the NFS share.

◆ ◆ ◆ CHAPTER 4

Deploying Oracle Identity Analytics

Follow the appropriate procedure on this page to deploy Oracle Identity Analytics to your application server.

Before You Begin -

- Verify that your JVM Maximum and Minimum Heap Size configuration meets the minimum values recommended for Oracle Identity Analytics 11gR1. See *Configuring Memory Settings* in "Preparing to Install Oracle Identity Analytics" for further information about these values.
- These instructions are for a stand-alone (non-clustered) Oracle Identity Analytics deployment.

Deploying on Tomcat

Follow the procedure in this section to deploy Oracle Identity Analytics on Tomcat. Before you begin, you should have already completed the procedures in the Chapter 3, “Installing Oracle Identity Analytics,” chapter.

To Deploy Oracle Identity Analytics on Tomcat

1. Stop the Tomcat application server.
2. Browse to the `tomcat install` directory.
3. Copy the configured WAR file to the `webapps` directory that is located in the `tomcat install` directory.
4. Start the Tomcat application server.

Deploying on WebSphere

Follow the procedure in this section to deploy Oracle Identity Analytics on WebSphere. Before you begin, you should have already completed the procedures in the Chapter 3, "Installing Oracle Identity Analytics," chapter.

To Configure WebSphere to Run Oracle Identity Analytics

1. In a browser, open the WebSphere Administrative Console:

   `http://`*Hostname*`:`*Port-Number*`/ibm/console/`

2. Choose Application Servers > *Server Name* > Process Definition > Java Virtual Machine.
3. Specify the following value under Generic JVM requirements, and save your changes.

   `-Xverify:none`

   If using at least WebSphere 6.1.0.3, go to the next step. Otherwise restart the application server and skip to "To Configure WebSphere to Run Oracle Identity Analytics" on page 38.
4. If using at least WebSphere 6.1.0.3, choose Application Servers > *Server Name* > Web Container > Custom Properties.
5. Create a new custom property using the following parameters and save your changes.

   Name: `com.ibm.ws.webcontainer.invokefilterscompatibility`

   Value: `true`
6. Restart the application server.

To Deploy Oracle Identity Analytics on WebSphere

1. In a browser, log in to the WebSphere Administrative Console.

   `http://`*Hostname*`:`*Port-Number*`/ibm/console/`

2. Choose Application > Install New Application in the left panel.
   a. Specify the path to the `rbacx.war` file.
      - If the `rbacx.war` file is located on the local system, type its complete path under Local File System.
      - If the file is on a remote machine, specify the path for the remote file system.
   b. Enter `rbacx` as the context root.
   c. Select "Show me all installation options and parameters" and click Next.
3. On the page "Choose to generate default bindings and mappings," select the default configuration and click Next.

4. Click Continue on the Application Security Warning page.

   The "Select Installation Options" page opens.

5. Complete the form:

   a. To install the application to a location other than the default location, type the path in the Directory to Install Application field. For example, on UNIX systems:

      ```
      /opt/IBM/Websphere/AppServer/installed Apps/Hostname
      ```

   b. Verify that the following options are selected:

      - Precompile JavaServer Pages files
      - Distribute application
      - User binary configuration
      - Enable class reloading

   c. Enter the name of the application in the Application Name field, and click Next.

      The default application name is set to `rbacx`.

6. On page "Map modules to servers," verify that the Oracle Identity Analytics application mapping is to the appropriate cluster/server and click Next.

   The "Provide options to compile JSPs" page opens.

7. Make the following changes and click Next:

   a. Select Web Module - Vaau RBACx.
   b. Change JDK Source Level to `15`

8. Click Next on the "Map shared libraries" page.

   The "Map virtual hosts for Web modules" page opens.

9. Verify that the Oracle Identity Analytics application mapping is set to the appropriate virtual host and click Next.

10. Verify that the context root is `rbacx` on the "Map context roots for Web modules" page, and click Next.

11. Review the summary and click Finish.

12. After WebSphere has completed installing Oracle Identity Analytics, click Save to Master Configuration to save the configuration, then click Save and wait for the page to clear.

13. Choose Enterprise Applications > rbacx > Manage Modules, and do the following:

    a. Verify that the cluster/server mapping is correct.

    b. Select Vaau RBACx > Class loader order.

    c. Under Class loader order, select "Class loaded with application class loader first," and save your changes.

14. Select `rbacx` from the Enterprise Applications window and start services by clicking Start.

Oracle Identity Analytics deployment on WebSphere is complete.

Deploying on WebLogic

Follow the procedure in this section to deploy Oracle Identity Analytics on WebLogic. Before you begin, you should have already completed the procedures in the Chapter 3, "Installing Oracle Identity Analytics," chapter.

To Deploy Oracle Identity Analytics on WebLogic

To deploy Oracle Identity Analytics on WebLogic, you must first extract the `.war` file to a staging folder.

1. At the command line, navigate to `$RBACX_HOME`.

Note – The `$RBACX_HOME` environment variable denotes the path to the directory to which you installed Oracle Identity Analytics.

---

1. Type the following commands at a command prompt to create a directory where the `.war` file would be exploded.

   These steps require a JDK.

   - **Windows:**

     ```
     C:\> mkdir rbacx_staging
     C:\> cd rbacx_staging
     C:\> jar -xvf ../rbacx.war
     ```

   - **UNIX:**

     ```
     $ mkdir rbacx_staging
     $ cd rbacx_staging
     $ jar -xvf ../rbacx.war
     ```

2. In a browser log in to the WebLogic administrative console:

   `http://`*Hostname*`:`*Port-Number*`/console/login/LoginForm.jsp`

3. In the administration console, go to the left panel and click Lock & Edit, located under Change Center.
4. Click Deployments, located under Domain Structure.
5. Click Install, located in the main panel under Deployments.

   The Install Application Assistant opens.

6. On the Locate Deployment To Install And Prepare For Deployment page, navigate to the `rbacx_staging` directory created in step two and select the folder such that it lists the contents of `rbacx.war`.
7. Select `rbacx`, and click Next.

8. Select the Install This Deployment As An Application option and click Next.
9. On the Optional Settings page, do the following:
   a. Ensure that the deployment is named `rbacx`.
   b. Under Security, select DDOnly: Use Only Roles And Policies That Are Defined In This Deployment.
   c. Under Source Accessibility, select Use The Defaults Defined By The Deployment's Targets.
   d. Click Next.
10. On the Review Your Choices And Click Finish page, select Yes, Take Me To The Deployments Configuration Screen.
11. Review the settings for the deployment, then click Next.
12. Click Deployments in the left panel.

    The Summary of Deployments panel opens.
13. Select `rbacx`, then click Start > Servicing All Requests.

    Select Yes to start the deployment.

A status of Start Running indicates that Oracle Identity Analytics has been successfully deployed.

Note – If a `'Session Error'` alert box is observed when accessing Oracle Identity Analytics, follow these steps.

1. Locate `dwr-context.xml` file within `/WEB-INF` directory of exploded `rbacx.war` file.
2. Replace `<dwr:controller debug="true" id="dwrController"/>` with the following

```
<dwr:controller debug="true" id="dwrController">
        <dwr:config-param name="allowScriptTagRemoting" value="false"/>
        <dwr:config-param name="crossDomainSessionSecurity" value="false"/>
</dwr:controller>
```

   - If the lines exist, change the value of `allowScriptTagRemoting` and `crossDomainSessionSecurity` to `false`.

Deploying on GlassFish

Follow the procedure in this section to deploy Oracle Identity Analytics on GlassFish application server. Before you begin, you should have already completed the procedure in the Chapter 3, “Installing Oracle Identity Analytics,” chapter.

To Deploy Oracle Identity Analytics on GlassFish

1. In a browser, log in to the GlassFish Admin Console.

   `http://`*Hostname*`:`*Port-Number*`/login.jsf`

   The default port number for the admin console is `4848`.
2. Choose Common Tasks > Applications > Web Applications in the left panel.
3. Click Deploy under Web Applications.
4. Select "Web Application (.war)" as the Type.
5. Select Location and navigate to the `rbacx.war` file on the local system under Deploy Enterprise Applications/Modules.
6. Complete the form:
   a. For Application Name, type `rbacx`.
   b. For Context Root, type `rbacx`.
   c. Verify that Status is selected and that Run Verifier, Precompile JSPs is not selected.
   d. Click OK.

Upon deployment, the `rbacx` application will be listed on the Web Applications page.

◆ ◆ ◆ CHAPTER 5

Verifying the Oracle Identity Analytics Installation

Verifying That the Oracle Identity Analytics Installation was Successful

Use the following procedure to verify that your Oracle Identity Analytics installation was successful and that the application is working properly.

To Verify an Oracle Identity Analytics Installation

1. Browse to your application server log files and verify that the `rbacx.log` file is present.

   This file is created when Oracle Identity Analytics is deployed to the application server.
2. Open `rbacx.log` in a text editor and check for a message indicating that Oracle Identity Analytics started successfully.
3. Using a browser, open the following URL: `http://`*Hostname*`:`*Port-Number*`/rbacx`
4. Use the following credentials to log in to the client:

   Username: `rbacxadmin`

   Password: `password`

PART III

Upgrading Oracle Identity Analytics

Part III provides detailed information and instructions to help you upgrade your Oracle Identity Analytics installation.

◆ ◆ ◆ CHAPTER 6

Overview of the Upgrade Process

Why Upgrade?

There are several reasons to upgrade to the latest version of Oracle Identity Analytics:

1. Access to the latest advanced features and functionality
2. Access to the latest security enhancements
3. Continued eligibility for full support and services

Phases of the Upgrade Process

The upgrade process is divided into three major phases:

- **Phase 1 - Prepare to upgrade Oracle Identity Analytics**

  In phase one you document your existing environment, choose an upgrade version, and document any custom components.

- **Phase 2 - Test the upgrade**

  In phase two you create a test environment, download third party library files, and deploy the upgrade in a test environment.

- **Phase 3 - Upgrade Oracle Identity Analytics in the production environment**

  In phase three you create a production rollout plan and deploy the upgrade in the production environment.

A Recommended Task List for Upgrading

1. Read the release notes of both the version you are upgrading *from*, and the version you are upgrading *to*, in order to understand important product changes.
2. Document your existing environment, which includes the following:
   - Platform - Be sure to document your application server and database server configuration.
   - Oracle Identity Analytics Installation - Document file folder locations and configuration settings.
   - Custom Components - Document custom configurations and utilities.
   - Custom Workflows - Document custom workflow approval steps.
   - Custom Reports - Create a backup of any custom reports. Custom reports include changes made to default Oracle Identity Analytics reports and any other reports uploaded into the application.
3. Create a backup of the existing database and Oracle Identity Analytics installation directory (including the contents), for example the `.indexes`, `conf`, `import`, `export`, and `reports` directories, the existing `.war` file and the exploded `.war` directory within the application server.

   This gives you the ability to reinstate the working environment back to the previous release, if necessary.
4. Create a test environment that mirrors the functionality of the production environment.
5. Develop a comprehensive test plan.

   The test plan's objective is to ensure that all currently utilized product functionality remains operational after the test and before deployment in the production environment.
6. Check the version level of the infrastructure components, for example the operating system, the JDK software, the application server, the database, all resources, and any provisioning systems.

   Confirm that support for your current environment is still provided in the latest version of Oracle Identity Analytics.
7. Rebuild any custom Java classes and utilities against the target product libraries.
8. Complete the entire upgrade before attempting to start the application server and resuming activity.

In addition, consider the following:

1. Upgrade the database schema if this step is required in the current release.

   The necessary files are provided in the distribution package inside the `db` folder.

2. If the `rm_idm_init.xml` file (located in the `$RBACX_HOME/conf` directory) is modified for customized Sun Identity Manager integration, extract and customize the file again to reflect the previous customizations.
3. If the `rbacxmessages.properties` file (located in the `WEB-INF/classes` directory) is modified for customized messages, extract and customize the file again to reflect the previous customizations.
4. If the `rbacxaudit-messages.properties` file (located in the `WEB-INF/classes` directory) is modified for customized messages, extract and customize the file again to reflect the previous customizations.
5. If a customized logo is required, create a backup of the `logo.gif` file located here: *exploded_rbacx.war_directory*`/images`
6. Back up any customized report(s) located in *Sun_Role_Manager_Installation_directory*`/reports`.
7. If the `jobs.xml` file was previously extracted from the *exploded_rbacx.war_directory*`/WEB-INF/` directory and updated with custom CRON expressions for any scheduled jobs, extract and customize the file again so as to retain the previous CRON expressions.

   Do not replace the `jobs.xml` file on the target release with a previous version because the `jobs.xml` file is likely to change with each new version of Oracle Identity Analytics.

   Following is a sample CRON expression for user file import:

```
<bean id="usersImportTrigger" class="org.springframework.scheduling.quartz.CronTriggerBean">
    <property name="jobDetail">
        <ref bean="usersImportJob"/>
    </property>
    <property name="cronExpression">
        <value>0 0/5 * * * ?</value>
    </property>
</bean>
```

8. Oracle recommends that you extract the `scheduling-context.xml` file, located in *exploded_rbacx.war_directory*`/WEB-INF/`

   To retain any previous triggering/scheduling customizations, changes should also be made to the `scheduling-context.xml` file for the target release.

   Following is a file sample that would require changes to the `scheduling-context.xml` file in the target release.

```
<property name="jobDetails">
    <list>
        <!--ref bean="usersImportJob"/-->
        <!--ref bean="accountsImportJob"/-->
        <!--ref bean="rolesImportJob"/-->
        <!--ref bean="glossaryImportJob"/-->
        <!--ref bean="policiesImportJob"/-->
        <!--ref bean="businessStructureImportJob"/-->
        <ref bean="identityAuditContinuousViolationScanJob"/>
        <ref bean="identityAuditViolationReminderJob"/>
```

```
            <ref bean="certificationReminderJob"/>
            <!--ref bean="reportReminderJob"/-->
            <!--ref bean="stableFolderCleanUpJob"/-->
            <!--ref bean="accountsMaintenanceJob"/-->
            <!--ref bean="roleMembershipRuleJob"/-->
            <ref bean="fullTextIndexMaintenancedJob"/>
            <ref bean="workflowStepSLAJob"/>
            <ref bean="roleStatusAndMembershipMaintenanceJob"/>
            <ref bean="rmPreviewCleanUpJob"/>
            <ref bean="userApplicationMaintenanceJob"/>
            <ref bean="postImportJobsLauncherJob"/>
            <ref bean="certificationRemediationJob"/>
            <ref bean="rmScanArchivalJob"/>
            <ref bean="eventPublishingJob"/>
            <!--<ref bean="rmeRuleMigrationJob"/>-->
            <!--ref bean="identityAuditDataMigrationJob"/-->

        </list>
    </property>

    <property name="triggers">
        <list>
            <!--ref bean="usersImportTrigger"/-->
            <!--ref bean="accountsImportTrigger"/-->
            <!--ref bean="accountsImportTrigger_2"/-->
            <!--ref bean="accountsImportTrigger_3"/-->
            <!--ref bean="rolesImportTrigger"/-->
            <!--ref bean="glossaryImportTrigger"/-->
            <!--ref bean="policiesImportTrigger"/-->
            <!--ref bean="businessStructureImportTrigger"/-->
            <ref bean="identityAuditContinuousViolationScanTrigger"/>
            <ref bean="identityAuditViolationReminderTrigger"/>
            <ref bean="certificationReminderTrigger"/>
            <!--ref bean="reportReminderTrigger"/-->
            <!--ref bean="stableFolderCleanUpTrigger"/-->
            <!--ref bean="accountsMaintenanceTrigger"/-->
            <!--ref bean="roleMembershipRuleTrigger"/-->
            <ref bean="fullTextIndexMaintenanceTrigger"/>
            <ref bean="workflowStepSLATrigger"/>
            <ref bean="roleStatusAndMembershipMaintenanceJobTrigger"/>
            <ref bean="rmPreviewCleanUpJobTrigger"/>
            <ref bean="userApplicationMaintenanceTrigger"/>
            <ref bean="postImportJobsLauncherTrigger"/>
            <ref bean="certificationRemediationTrigger"/>
            <ref bean="rmScanArchivalJobTrigger"/>
            <ref bean="eventPublishingJobTrigger"/>
            <!--<ref bean="rmeRuleMigrationJobTrigger"/>-->
            <!--ref bean="identityAuditDataMigrationTrigger"/-->

        </list>
    </property>
```

◆ ◆ ◆ CHAPTER 7

Preparing to Upgrade Oracle Identity Analytics

In this phase of the upgrade process you will document your existing environment, document any custom components, and choose an upgrade version.

Documenting the Existing Environment

Document your existing environment, including the following items:

1. Application servers - Record the application server name and version number, including any service packs. Also, note the following:
   a. The operating system version number, including any service packs.
   b. The version number of the Java Development Kit (JDK) installed on the application server.
2. Database servers - Record the database server name and version number and any additional service packs.
3. Supported resources - Record the names of all supported resources, including version numbers, and any installed service packs.

   Supported resources also include integrated provisioning servers, such as Oracle Identity Manager.
4. Web servers - Record the name and version number of any web servers, including any additional service packs.

Documenting the Oracle Identity Analytics Installation

Document your Oracle Identity Analytics installation, including the release and build version number.

To Obtain the Oracle Identity Analytics Release and Build Version

The Oracle Identity Analytics release version information can be obtained using any of the following steps.

- To obtain version information from the `rbacx.log` file
  1. Start Oracle Identity Analytics.
  2. Open the `rbacx.log` file located in the `$RBACX_HOME/logs` folder.
  3. Search the log for the Oracle Identity Analytics version information.

     The Oracle Identity Analytics version number is written to the log when Oracle Identity Analytics is started, for example

     ```
     Oracle Identity Analytics (build: 5.0.0.200910016491-GA) Started
     ```
- To obtain version information from `VERSION.txt` within the `.war` file
  1. Navigate to the *exploded_rbacx.war_directory*`/WEB-INF/classes` directory.
  2. Locate `VERSION.txt` and view the contents using a text-editor.
  3. Search for the `Implementation-Version` tag, which contains the release version number.

     For example, `Implementation-Version=5.0.0.200910016491-GA`.
- To obtain version information from `MANIFEST.MF` within the `.war` file
  1. Navigate to *exploded_rbacx.war_directory*`/META-INF` directory.
  2. Using a text-editor, open the `MANIFEST.MF` file.
  3. Search for the `Implementation-Version` tag, which contains the release version number.

     For example, `Implementation-Version=5.0.0.200910016491-GA`.
- To obtain only the version number
  1. Log on to the Oracle Identity Analytics user interface.
  2. Click About in the top-right corner of the screen.

     A window containing the version number opens, for example `Version 11.1.1.3.0`.

Documenting Custom Components

Document any custom components, including the following:

- Custom File-System Objects
- Custom Repository Objects

Documenting Custom File-System Objects

Oracle recommends upgrading custom file-system objects. File-system objects that may have been customized include the following:

- *Modified file*

  Record any changes made to the default `iam.properties` file.
- *Modified file*

  Record any changes made to the default `jdbc.properties` file.
- *Modified file*

  Record any changes made to the default `ldap.properties` file.
- *Modified file*

  Record any changes made to the default `rm_idm_init.xml` file.
- *Modified file*

  Record any changes made to default `log4j.properties` file for customized loggings.
- *Modified file*

  Record any changes made to the default `rbacxmessages.properties` file.
- *Modified file*

  Record any changes made to the default `rbacxaudit-messages.properties` file.
- **Customized property files**

  Record any changes made to other property files on the system.
- **Customized resource adapters (and any other custom Java code)**

  Customized resource adapters may require recompilation depending on the target Oracle Identity Analytics version. All custom Java that uses Oracle Identity Analytics APIs (including custom resource adapters) requires a recompilation as part of an upgrade. Also, consider other Java classes that may use the Oracle Identity Analytics library.
- **Custom utilities**

  Custom Java utilities, pre-processors, and data parsers may require review and recompilation depending on the target Oracle Identity Analytics version. Plan to re-evaluate the code in these scripts to ensure that they align with database schema changes or application modifications.

- **Modified JavaServer Pages (JSP Files)**

  Recent Oracle Identity Analytics versions may include API changes. If JSP files were modified during installation, they need to be updated when upgrading. Any JSP file that shipped with the product and was modified during a deployment (or any custom JSP file that uses Oracle Identity Analytics APIs) should be updated so that it is compatible with the JSP structure and API in the target release.

Documenting Custom Repository Objects

Oracle recommends upgrading custom repository objects. Repository objects that may have been customized include the following:

- **Modified Email Templates**

  Custom e-mail templates may require an export to take advantage of current product enhancements.

- **Custom Repository Schema**

  If a schema change occurred since Oracle Identity Analytics was last installed or upgraded, a schema update is required.

- **Custom Reports**
  - Changes made to any reports in the `$RBACX_HOME/reports` directory should be incorporated into the reports present in the latest version of Oracle Identity Analytics.
  - Do not overwrite reports in the target release with previous versions because any changes made to the Oracle Identity Analytics schema will cause the reports to break.
  - Custom reports uploaded to Oracle Identity Analytics may require modification in order to comply with schema changes.

    Note - The `$RBACX_HOME` environment variable denotes the path to Oracle Identity Analytics Installation directory.

- **Custom Workflow Steps**

  Document all custom workflow steps created during Oracle Identity Analytics implementation. These steps would need to be recreated in the newer version of Oracle Identity Analytics.

- **Custom CRON Expression**

  Custom CRON expressions must be included in the latest version of the Oracle Identity Analytics `jobs.xml` file, otherwise the CRON expressions will be lost.

- **Custom Import Triggers**

  To retain previous triggering/scheduling customizations, changes should also be made in the target release `scheduling-context.xml` file

Note – Any occurrence of REPLACE_ME needs to be changed to FILE_SERVER for feeds imported through the Oracle Identity Analytics file importer module.

Choosing the Upgrade Version

After completing the inventory assessment, choose the version of Oracle Identity Analytics that fulfills your requirements. You may want the latest version, or you may want a more mature version that has service packs available. It is a recommended that you upgrade to the most recent Oracle Identity Analytics release that is available during your testing time frame.

After choosing the target Oracle Identity Analytics release, verify that your current platform is supported.

Also, do the following:

- Read the Release Notes for the target Oracle Identity Analytics release. Pay special attention to the Known Issues section to determine if you need to upgrade the operating system, the JDK software, the application server, or any resources.

◆ ◆ ◆ CHAPTER 8

Upgrading Oracle Identity Analytics in a Test Environment

Creating a Test Environment

Create a test environment similar to the production environment. Replicate the following items from the production environment using the same hardware and software versions:

- Application server
- Database server
- Web server (optional component)
- Common client machine with the corporate image and browser
- Resources and other integrated applications
- Oracle Identity Analytics version and configuration

Downloading Third-party Library Files

Third-party files need to be downloaded prior to upgrading. Downloaded files should be saved to a library folder, which will be referred to as `RM_LIB`. For example,

- **Windows**

  `C:\RM_Lib`

- **UNIX**

  `/opt/RM_Lib`

The `jasper-jdt.jar` File

Download the `jasper-jdt.jar` file from this site:

http://dlc.sun.com/rolemanager/Certification_And_Reporting/

This file is required by the Oracle Identity Analytics certification and reporting feature.

JDBC Drivers

The JAR files for establishing a JDBC connection can be downloaded from this site:

http://dlc.sun.com/rolemanager/Database_Drivers/

The JAR files that are required for each database type are summarized in the following table.

Database Type	File Name
IBM DB2	`db2jcc.jar, db2jcc_license_cu.jar`
Microsoft SQL Server	MS SQL Server jTDS JDBC driver is included in the Oracle Identity Analytics WAR file and does not need to be downloaded separately.
MySQL	MySQL drivers are included in the Oracle Identity Analytics WAR file and do not need to be downloaded separately.
Oracle	`ojdbc14.jar` / `ojdbc5.jar` / `ojdbc6.jar`

Note – Drivers for MS SQL Server (jTDS) and MySQL are bundled in the Oracle Identity Analytics WAR file. Do not install jTDS or MySQL drivers in the Oracle Identity Analytics `lib` directory.

Provisioning Server Connectivity Files

Depending on which third-party provisioning server you are using with Oracle Identity Analytics (CA eTrust, IBM Tivoli Identity Manager, or Oracle Identity Manager), you need to download the corresponding library files for that provisioning server. You do not need to download library files if you are using Oracle Identity Analytics as your provisioning server.

Download provisioning server connectivity files from this site:

http://dlc.sun.com/rolemanager/Provisioning_Server_Connectivity/

Configuring the RBACX_HOME Environment Variable

Before upgrading Oracle Identity Analytics you need to configure the RBACX_HOME environment variable. The RBACX_HOME variable should be permanently set to the directory where you will install Oracle Identity Analytics. To create a permanent environment variable, refer to your operating system documentation for instructions.

To temporarily set the $RBACX_HOME environment variable, type the following command at a command line. The $RBACX_HOME environment variable will remain valid for the length of your session.

- **Windows**:

  `set RBACX_HOME=`*Path to the Oracle Identity Analytics installation directory*

- **UNIX**:

  `export RBACX_HOME=`*Path to the Oracle Identity Analytics installation directory*

Note –

- A permanent $RBACX_HOME environment variable should be created under the application server's owner profile. Oracle Identity Analytics deployment will fail if RBACX_HOME is declared in a profile inaccessible by the application server.
- For a clustered deployment, the $RBACX_HOME environment variable needs to be created on every cluster member.

Configuring JVM Options

- You should determine your memory need and set values in your application server's JVM accordingly.

  The recommended memory settings are as follows:

  ```
  -Xmx2048m -Xms2048m
  ```

  Depending on your specific implementation, you might need to increase these recommended values if you face performance issues with the web interface. Keeping a low minimum value minimizes garbage collection, whereas keeping a higher value decreases response time in the web interface.

- IPv4 is required by Oracle Identity Analytics for network communication. Refer to the operating system documentation for instructions to enable IPv4 stack. Add the following JVM option to enforce IPv4 preference over IPv6:

  ```
  -Djava.net.preferIPv4Stack=true
  ```

Refer to your application server's documentation for information about configuring JVM options.

Preparing to Upgrade the Test Environment

Before upgrading the Oracle Identity Analytics installation in the test environment, do the following:

Before You Begin -

Shut down the Oracle Identity Analytics instance running on the system before backing up your files.

1. **Back up the current Oracle Identity Analytics installation**

   Before upgrading, back up the Oracle Identity Analytics database and the directory where Oracle Identity Analytics is installed. Use third-party backup software or a backup utility supplied with the operating system to back up the Oracle Identity Analytics file system. To back up the database, refer to the documentation provided by your database vendor.

2. **Back up customized Oracle Identity Analytics repository objects**

   Oracle Identity Analytics provides a set of database objects, such as workflow task definitions, that are usually customized for an environment. The upgrade process replaces some of these objects in the database after saving them in the file system.

3. **Verify the environment**

   Before upgrading Oracle Identity Analytics in the test environment, verify the following:

   - All servers are present on the network
   - The schema is up-to-date
   - The location of the Oracle Identity Analytics application is correct

Deploying the Upgrade in a Test Environment

Deploying an upgrade in a test environment includes the following tasks:

- Upgrading the database
- Upgrading the environment
- Restoring customizations after the upgrade

To Upgrade the Oracle Identity Analytics Schema on the Database Server on a Windows Platform

Before You Begin - You should have created a backup of the Oracle Identity Analytics database.

Go to the section that contains instructions for your database server.

Microsoft SQL Server

If SQL Server is installed locally, you can upgrade the Oracle Identity Analytics schema using either the command prompt or the SQL Server Query Analyzer tool *or* the Management Studio tool. If SQL Server is not installed locally, use the SQL Server Query Analyzer tool or the Management Studio tool to upgrade the schema.

- To upgrade the schema from a command prompt, follow these steps:
  1. Navigate to the directory containing the upgrade scripts (`C:\RM_Upgrade\db`) by typing:

     ```
     C:\> cd C:\RM_Upgrade\db
     ```

  2. Run the following command(s) to execute the upgrade script(s):

     ```
     C:\> sqlcmd -S localhost -i
     rbacx-previous_version_To_current_version_mssql.sql -U rbacxservice -P
     rbacxservice -d rbacx
     ```

- To create the schema using Query Analyzer or Management Studio, follow these steps:
  1. Log in to the database server as `rbacxservice`.
  2. Click the Open Query File menu and locate the `rbacx-`*previous_version*`_To_`*current_version*`_mssql.sql` file.
  3. Execute the SQL file.

     This will upgrade the `rbacx` database on the server.

Oracle

You can upgrade the Oracle Identity Analytics schema using either the command prompt or the Oracle iSQL Plus Web Console (available in Oracle 10g Database Server). If the Oracle Database Server is not installed locally, use the iSQL Plus Web Console to upgrade the schema.

- To upgrade the schema from a command prompt, follow these steps:
  1. Navigate to the directory containing the upgrade scripts (`C:\RM_Upgrade\db`) by typing:

     ```
     C:\> cd C:\RM_Upgrade\db
     ```

  2. Run the following command(s) to execute the upgrade script(s):

     ```
     C:\> sqlplus rbacxservice/rbacxservice
     @rbacx-previous_version_To_current_version_oracle.sql
     ```

- To create the schema using the iSQL Plus Web Console, follow these steps:
  1. Open the following URL in a web browser.

     The default port for the iSQL Plus Web Console is `5560`.

     `http://`*hostname*`:5560/isqlplus`
  2. Select Load Script and browse to `C:\RM_Upgrade\db`.
  3. Locate the file `rbacx-`*previous_version*`_To_`*current_version*`_oracle.sql` and click Load.

     The Oracle Identity Analytics upgrade schema creation script is loaded into the workspace window.

4. Click Execute.

   The script is executed and the Oracle Identity Analytics schema is upgraded on the system.

DB2

The following steps assume that the DB2 database server is installed locally. One of the following authorizations is required to upgrade the database:

```
sysadm
```

```
sysctrl
```

To upgrade the schema from a command prompt, follow these steps:

1. Navigate to the directory containing the upgrade scripts (`C:\RM_Upgrade\db`) by typing:

   ```
   C:\> cd C:\RM_Upgrade\db
   ```

2. Run the following command(s) to execute the upgrade script(s):

   ```
   C:\> db2cmd
   ```

   ```
   db2 connect to rbacx user rbacxservice using rbacxservice
   ```

   ```
   db2 -tvf rbacx-previous_version_To_current_version_db2.sql
   ```

MySQL

The following assumes that the MySQL database server is installed locally.

To upgrade the schema from a command prompt, run the following command(s) to execute the upgrade script(s):

```
C:\> mysql --user=rbacxservice --password=rbacxservice <
rbacx-previous_version_to_current_version_mysql.sql rbacx
```

Note – If you are using MySQL 5.0, `lower_case_table_names` variable needs to be changed from its default value. Make the following change to `lower_case_table_names` in MySQL's configuration file.

```
lower_case_table_names=1
```

To Upgrade the Oracle Identity Analytics Schema on the Database Server on a UNIX Platform

Before You Begin - You should have created a backup of the Oracle Identity Analytics database.

Oracle

You can upgrade the Oracle Identity Analytics schema using either the command prompt or the Oracle iSQL Plus Web Console (available in Oracle 10g Database Server). If the Oracle Database Server is not installed locally under the `/opt` directory, use the iSQL Plus Web Console to upgrade the schema.

- To upgrade the schema from a command prompt, follow these steps:
  1. Navigate to directory containing the upgrade scripts (`/opt/RM_Upgrade/db`) by typing:

     ```
     $ su - oracle
     ```

     ```
     $ export ORACLE_HOME=/opt/oracle/product/10.2.0
     ```

     ```
     $ cd /opt/RM_Upgrade/db
     ```

  2. Run the following command(s) to execute the upgrade script(s):

     ```
     $ ./sqlplus rbacxservice/rbacxservice
     @rbacx-previous_version_To_current_version_oracle.sql
     ```

     The Oracle Identity Analytics database schema is upgraded on Oracle Database server.
- To create the schema using the iSQL Plus Web Console, follow these steps:
  1. Open the following URL in a web browser.

     The default port for the iSQL Plus Web Console is 5560.

     `http://hostname:5560/isqlplus`

  2. Select Load Script and browse to `/opt/RM_Upgrade/db`.
  3. Locate the file `rbacx-previous_version_To_current_version_oracle.sql` and click Load.

     The Oracle Identity Analytics schema upgrade script is loaded into the workspace window.

  4. Click Execute.

     The script is executed and the Oracle Identity Analytics schema is upgraded on the system.

DB2

The following steps assume that the DB2 database server is installed locally. One of the following authorizations is required to upgrade the database:

```
sysadm
```

```
sysctrl
```

To upgrade the schema using a terminal session, follow these steps:

1. Navigate to the directory containing the upgrade scripts (`/opt/RM_Upgrade/db`) by typing:

   ```
   # cd /opt/RM_Upgrade/db
   ```

2. Run the following command(s) to execute the upgrade script(s):

   ```
   db2 connect to rbacx user rbacxservice using rbacxservice
   ```

```
db2 -tvf rbacx-previous_version_To_current_version_db2.sql
```

MySQL

The following assumes that the MySQL database server is installed locally.

To upgrade the schema from a command prompt, run the following command(s) to execute the upgrade script(s):

```
$ mysql -user=rbacxservice -password=rbacxservice<
rbacx-previous_version_To_current_version_mysql.sql rbacx
```

Note – If you are using MySQL 5.0, `lower_case_table_names` variable needs to be changed from its default value. Make the following change to `lower_case_table_names` in MySQL's configuration file.

```
lower_case_table_names=1
```

To Upgrade the Environment on a Windows Platform for a Standalone Deployment

Use the following steps to upgrade Oracle Identity Analytics manually on a supported Windows platform.

1. Stop the application server.
2. Update the Oracle Identity Analytics database.
3. Type the following commands in the test environment:

   `set INSPATH=`*Path to the upgrade software* (For example, `set INSPATH=C:\RM_Upgrade`)

   `set RBACXWAR=`*Path to the Oracle Identity Analytics deployment directory* (For example, `set RBACXWAR=`*Tomcat install directory*`\webapps`)

   `set RM_LIB=`*Path to the downloaded third-party library files* (For example, `set RM_LIB=C:\RM_Lib`)

   `set TEMP=`*Path to the temporary directory*
4. Run the pre-process commands:

   ```
   mkdir %TEMP%
   ```

   ```
   cd %TEMP%
   ```

   ```
   jar -xvf %INSPATH%\rbacx.war
   ```
5. Copy the downloaded third-party library files to the Oracle Identity Analytics library directory.

   ```
   copy %RM_LIB%
   ```

```
* %TEMP%\WEB-INF\lib
```

6. Remove report-related files from the *Oracle Identity Analytics Installation Directory*\reports directory

   ```
   rmdir /s /q %RBACX_HOME%\reports
   ```

7. Copy the target Oracle Identity Analytics version-specific reports based on the database server to the *Oracle Identity Analytics Installation Directory*\reports folder.

   The following sample steps assume that the target database server is MySQL.

   ```
   xcopy %INSPATH%\reports %RBACX_HOME%\reports /I/E
   ```

   ```
   xcopy %RBACX_HOME%\reports\mysql
   ```

   ```
   * %RBACX_HOME%\reports
   ```

8. Remove search-related files from the *Oracle Identity Analytics Installation Directory*\.indexes directory

   ```
   rmdir /s /q %RBACX_HOME%\.indexes
   ```

9. Copy the files related to advanced search from the upgrade folder to the *Oracle Identity Analytics Installation Directory*\.indexes folder.

   ```
   xcopy %INSPATH%\.indexes %RBACX_HOME%\.indexes /I/E
   ```

10. Make changes to the following files located under %INSPATH%\conf directory to reflect customizations as documented in "Documenting Custom Components" on page 53.

    - **iam.properties** - In a text editor, replace any occurrences of $RBACX_HOME with the Oracle Identity Analytics installation directory path.
    - **jdbc.properties** - In a text editor, edit the following lines, substituting $SERVER_NAME and $PORT_NUMBER with the host name and connectivity port of the target database. Refer to "UNIX: To Create the Oracle Identity Analytics Schema on the Database Server" on page 24 for instructions.
    - **ldap.properties** - Refer to *Authenticating With LDAP* for instructions on LDAP customizations.
    - **rm_idm_init.xml** - This file is required by Oracle Identity Analytics to exchange and manage information with Identity Manager.

11. Remove the configuration related directory from *Oracle Identity Analytics Installation Directory* directory

    ```
    rmdir /s /q %RBACX_HOME%\conf
    ```

12. Copy configuration directory and files from the upgrade directory to the *Oracle Identity Analytics Installation Directory* directory.

    ```
    xcopy %INSPATH%\conf %RBACX_HOME%\conf /I/E
    ```

13. Apply any customizations necessary for the environment to the extracted .war file in the %TEMP% directory.

14. Make the following changes if there are multiple instances of Oracle Identity Analytics, standalone or clustered, on the same subnet.
    a. Navigate to `%TEMP%\WEB-INF` directory.
    b. In a text editor, open `application-context.xml`, find bean id `commManager`, and examine the `constructor-arg` value.
    c. Set the `constructor-arg` value with a unique instance name, for example `value="SRM-Instance-1"`.
    d. In a text editor, open `search-context.xml`, find bean id `searchConfiguration`, and examine the `constructor-arg` value.
        - The deployment is a standalone, `constructor-arg` defaults to a value of `0`, which is specified as `value="0"`.
    e. Navigate to `%TEMP%\WEB-INF\classes` directory and do the following:
        i. In a text editor, open `oscache.properties` (located in the `%TEMP%\WEB-INF\classes`), and find the `cache.cluster.multicast.ip` property.
        ii. Uncomment `cache.cluster.multicast.ip` by removing `#` at the start of the line. Each Oracle Identity Analytics instance requires a unique `cache.cluster.multicast.ip` value.
15. To migrate `Role Provisioning` and `Identity Audit` rules, open `scheduling-context.xml` using a text editor and find bean id `quartzSchedulerFactoryBean`.
    a. Examine the `jobDetails` list. Uncomment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.
    b. Examine the `triggers` list. Uncomment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`
16. Repackage the `.war` file in the `%TEMP%` directory if changes are made. Type the following commands in the test environment:

    ```
    cd %TEMP%
    ```

    ```
    jar -cvfM %RBACXWAR%\rbacx.war .
    ```
17. Uninstall Oracle Identity Analytics from the application server.
18. Deploy the rebuild Oracle Identity Analytics `.war` file on the target application server. Refer to Chapter 4, "Deploying Oracle Identity Analytics," for instructions on Oracle Identity Analytics deployment.
19. Start the application server.
20. Go to the following address in a browser:
    `https://`*Hostname*`:`*Port-Number*`/rbacx/welcome.action`

    When the Welcome screen appears, enter your `rbacxadmin` user name and password and verify that the installation is successful.
21. Open the `rbacx.log` file and check for errors.

The installation is successful if the following message appears in the `rbacx.log` file:

```
Oracle Identity Analytics (build: 11.1.1.3.0.20100727_21_7842) Started
```

22. `Role Provisioning` and `Identity Audit` rules are automatically migrated by Oracle Identity Analytics when started for the first time. The migration jobs should be disabled for any subsequent restarts. To disable the jobs, navigate to the `rbacx.war` directory exploded by the application server and locate `scheduling-context.xml` under `rbacx\WEB-INF`. Open it using a text editor and find bean ID `quartzSchedulerFactoryBean`.
    a. Examine the `jobDetails` list. Comment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.
    b. Examine the `triggers` list. Comment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`.

To Upgrade the Environment on a UNIX Platform for a Standalone Deployment

Use the following steps to upgrade Oracle Identity Analytics manually on a supported UNIX platform.

1. Stop the application server.
2. Update the Oracle Identity Analytics database.
3. Type the following commands in the test environment:

    `export INSPATH=`*Path to the upgrade software* (For example, `export INSPATH=/opt/RM_Upgrade`)

    `export RBACXWAR=`*Path to the Oracle Identity Analytics deployment directory* (For example, `export RBACXWAR=`*Tomcat install directory*`/webapps`)

    `export RM_LIB=`*Path to the downloaded third-party library files* (For example, `export RM_LIB=/opt/RM_Lib`)

    `export TEMP=`*Path to the temporary directory*

4. Run the pre-process commands:

    ```
    mkdir $TEMP

    cd $TEMP

    jar -xvf $INSPATH/rbacx.war
    ```

5. Copy the downloaded third-party library files to the Oracle Identity Analytics library directory.

    ```
    cp $RM_LIB/* $TEMP/WEB-INF/lib
    ```

6. Remove report-related files from the *Oracle Identity Analytics Installation Directory*`/reports` directory.

```
/usr/bin/rm -f $RBACX_HOME/reports
```

7. Copy the target Oracle Identity Analytics version-specific reports based on the database server to the *Oracle Identity Analytics Installation Directory*`/reports` folder.

   The following sample steps assume that the target database server is MySQL.

   ```
   cp -R $INSPATH/reports $RBACX_HOME/.
   ```

   ```
   cp -R $RBACX_HOME/reports/mysql/* $RBACX_HOME/reports/.
   ```

8. Remove search-related files from the *Oracle Identity Analytics Installation Directory*`/.indexes` directory.

   ```
   /usr/bin/rm -f $RBACX_HOME/.indexes
   ```

9. Copy the files related to advanced search from the upgrade folder to *Oracle Identity Analytics Installation Directory*`/.indexes`

   ```
   cp -R $INSPATH/.indexes $RBACX_HOME/.
   ```

10. Make changes to the following files located under `$INSPATH/conf` directory to reflect customizations as documented in "Documenting Custom Components" on page 53.

    - **iam.properties** - In a text editor, replace any occurrences of `$RBACX_HOME` with the Oracle Identity Analytics installation directory path.
    - **jdbc.properties** - In a text editor, edit the following lines, substituting $SERVER_NAME and $PORT_NUMBER with the host name and connectivity port of the target database. Refer to "UNIX: To Create the Oracle Identity Analytics Schema on the Database Server" on page 24 for instructions.
    - **ldap.properties** - Refer to *Authenticating With LDAP* for instructions on LDAP customizations.
    - **rm_idm_init.xml** - This file is required by Oracle Identity Analytics to exchange and manage information with Identity Manager.

11. Remove the configuration related directory from *Oracle Identity Analytics Installation Directory* directory

    ```
    /usr/bin/rm -f $RBACX_HOME/conf
    ```

12. Copy configuration directory and files from the upgrade directory to the *Oracle Identity Analytics Installation Directory* directory.

    ```
    cp -R $INSPATH/conf $RBACX_HOME/.
    ```

13. Apply any customizations necessary for the environment to the extracted `.war` file in the `$TEMP` directory.

14. Make the following changes if there are multiple instances of Oracle Identity Analytics, standalone or clustered, on the same subnet.

    a. Navigate to `$TEMP/WEB-INF` directory.

    b. In a text editor, open `application-context.xml`, find bean id `commManager`, and examine the `constructor-arg` value.

c. Set the `constructor-arg` value with a unique instance name, for example `value="SRM-Instance-1"`.

d. In a text editor, open `search-context.xml`, find bean id `searchConfiguration`, and examine the `constructor-arg` value.

- The deployment is a standalone, `constructor-arg` defaults to a value of `0`, which is specified as `value="0"`.

e. Navigate to `$TEMP/WEB-INF/classes` directory and do the following:

i. In a text editor, open `oscache.properties` (located in the `$TEMP/WEB-INF/classes`), and find the `cache.cluster.multicast.ip` property.

ii. Uncomment `cache.cluster.multicast.ip` by removing `#` at the start of the line. Each Oracle Identity Analytics instance requires a unique `cache.cluster.multicast.ip` value.

15. To migrate `Role Provisioning` and `Identity Audit` rules, open `scheduling-context.xml` using a text editor and find bean id `quartzSchedulerFactoryBean`.

a. Examine the `jobDetails` list. Uncomment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.

b. Examine the `triggers` list. Uncomment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`

16. Repackage the `.war` file in the `$TEMP` directory if changes are made. Type the following commands in the test environment:

```
cd $TEMP
```

```
jar -cvfM $RBACXWAR/rbacx.war .
```

17. Uninstall Oracle Identity Analytics from the application server.

18. Deploy the rebuild Oracle Identity Analytics `.war` file on target application server.

Refer to Chapter 4, "Deploying Oracle Identity Analytics," for instructions on Oracle Identity Analytics deployment.

19. Start the application server.

20. Go to the following address in a browser:
`https://`*Hostname*`:`*Port-Number*`/rbacx/welcome.action`

When the Welcome screen appears, enter your `rbacxadmin` user name and password and verify that the installation is successful.

21. Open the `rbacx.log` file and check for errors.

The installation is successful if the following message appears in the `rbacx.log` file:

```
Oracle Identity Analytics (build: 11.1.1.3.0.20100727_21_7842) Started
```

22. `Role Provisioning` and `Identity Audit` rules are automatically migrated by Oracle Identity Analytics when started for the first time. The migration jobs should be disabled for any subsequent restarts. To disable the jobs, navigate to the `rbacx.war` directory exploded

by the application server and locate `scheduling-context.xml` under `rbacx/WEB-INF`. Open it using a text editor and find bean ID `quartzSchedulerFactoryBean`.

a. Examine the `jobDetails` list. Comment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.

b. Examine the `triggers` list. Comment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`.

To Upgrade the Environment on a Windows Platform for a Clustered Deployment

Use the following steps to upgrade Oracle Identity Analytics manually on a supported Windows platform.

1. Stop the application server.
2. Update the Oracle Identity Analytics database.
3. Type the following commands in the test environment:

   `set INSPATH=`*Path to the upgrade software* (For example, `set INSPATH=C:\RM_Upgrade`)

   `set RBACXWAR=`*Path to the Oracle Identity Analytics deployment directory* (For example, `set RBACXWAR=`*Tomcat install directory*`\webapps`)

   `set RM_LIB=`*Path to the downloaded third-party library files* (For example, `set RM_LIB=C:\RM_Lib`)

   `set TEMP=`*Path to the temporary directory*

4. Run the pre-process commands:

   ```
   mkdir %TEMP%

   cd %TEMP%

   jar -xvf %INSPATH%\rbacx.war
   ```

5. Copy the downloaded third-party library files to the Oracle Identity Analytics library directory.

   ```
   copy %RM_LIB%* %TEMP%\WEB-INF\lib
   ```

6. Remove report-related files from the *Oracle Identity Analytics Installation Directory*`\reports` directory

   ```
   rmdir /s /q %RBACX_HOME%\reports
   ```

7. Copy the target Oracle Identity Analytics version-specific reports based on the database server to the *Oracle Identity Analytics Installation Directory*`\reports` folder.

   The following sample steps assume that the target database server is MySQL.

   ```
   xcopy %INSPATH%\reports %RBACX_HOME%\reports /I/E

   xcopy %RBACX_HOME%\reports\mysql * %RBACX_HOME%\reports
   ```

8. Remove search-related files from the *Oracle Identity Analytics Installation Directory*\.indexes directory

   ```
   rmdir /s /q %RBACX_HOME%\.indexes
   ```

9. Copy the files related to advanced search from the upgrade folder to the *Oracle Identity Analytics Installation Directory*\.indexes folder.

   ```
   xcopy %INSPATH%\.indexes %RBACX_HOME%\.indexes /I/E
   ```

10. Make changes to the following files located under %INSPATH%\conf directory to reflect customizations as documented in "Documenting Custom Components" on page 53.

    - **iam.properties** - In a text editor, replace any occurrences of $RBACX_HOME with the Oracle Identity Analytics installation directory path.

      Note: When the application server is clustered, the nodes can maintain localized import/export directories, or utilize import/export directories on a NFS share. If the nodes use a shared NFS location for import/export, substitute $RBACX_HOME with the path to the NFS share.

    - **jdbc.properties**
      - In a text editor, edit the following lines, substituting $SERVER_NAME and $PORT_NUMBER with the host name and connectivity port of the target database. Refer to "UNIX: To Create the Oracle Identity Analytics Schema on the Database Server" on page 24 for instructions.
      - Make the following change to jdbc.properties for clustered Quartz support, and save the file:

        ```
        jdbc.quartz.isClustered=true
        ```

    - **ldap.properties** - Refer to *Authenticating With LDAP* for instructions on LDAP customizations.
    - **rm_idm_init.xml** - This file is required by Oracle Identity Analytics to exchange and manage information with Identity Manager.

11. Remove the configuration related directory from *Oracle Identity Analytics Installation Directory* directory

    ```
    rmdir /s /q %RBACX_HOME%\conf
    ```

12. Copy configuration directory and files from the upgrade directory to the *Oracle Identity Analytics Installation Directory* directory.

    ```
    xcopy %INSPATH%\conf %RBACX_HOME%\conf /I/E
    ```

13. Apply any customizations necessary for the environment to the extracted .war file in the %TEMP% directory.

14. Make the following changes to enable Oracle Identity Analytics support for clustered application server deployments.

    a. Navigate to %TEMP%\WEB-INF directory.

b. In a text editor, open `application-context.xml`, find bean ID `commManager`, and examine the `constructor-arg` value.

c. Set the `constructor-arg` value as the cluster name-for example, `value="Prod-1-Cluster"`.

- If Oracle Identity Analytics is deployed on multiple clusters within the same subnet, you should define unique `constructor-arg` values for each deployment. For example, if both clusters `Prod-Cluster` and `QA-Cluster` have Oracle Identity Analytics deployed, the `constructor-arg` values of each should be set to `Prod-Cluster` and `QA-Cluster` respectively.
- Members of the same cluster should have the same `constructor-arg` value.

d. In a text editor, open `search-context.xml`, find bean id `searchConfiguration`, and examine the `constructor-arg` value.

- For a clustered deployment, `constructor-arg` defaults to a value of `1` or `2` depending on the location of the `.indexes` directory.
  i. To set the `constructor-arg` value, do the following:
  - If each clustered node will be accessing *local* individual `.indexes` directories, set `constructor-arg` to `1`. For example, `value="1"`
  - If clustered nodes will be accessing *a shared*

    `.indexes`

    directory, set `constructor-arg` to `2`. For example, `value="2"`. The `.indexes` directory needs to be located on an NFS share location where each clustered node has read-write permission. Edit `indexLocation` such that the NFS share location replaces `$RBACX_HOME` in the `value` field.

e. If multiple instances of Oracle Identity Analytics, standalone or clustered, exist on the same subnet, navigate to the `%TEMP%\WEB-INF\classes` directory and do the following:

i. In a text editor, open `oscache.properties` (located in the `%TEMP%\WEB-INF\classes` directory), and find the `cache.cluster.multicast.ip` property.

ii. Uncomment `cache.cluster.multicast.ip` by removing `#` at the start of the line. Each non-member instance requires a unique `cache.cluster.multicast.ip` value.

15. To migrate `Role Provisioning` and `Identity Audit` rules, open `scheduling-context.xml` using a text editor and find bean id `quartzSchedulerFactoryBean`.

a. Examine the `jobDetails` list. Uncomment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.

b. Examine the `triggers` list. Uncomment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`

16. Repackage the `.war` file in the `%TEMP%` directory if changes are made. Type the following commands in the test environment:

```
cd %TEMP%

jar -cvfM %RBACXWAR%\rbacx.war .
```

17. Uninstall Oracle Identity Analytics from the application server.
18. Deploy the rebuild Oracle Identity Analytics `.war` file on the target application server. Refer to Chapter 4, "Deploying Oracle Identity Analytics," for instructions about Oracle Identity Analytics deployment.
19. Start the application server.
20. Go to the following address in a browser:
    `https://`*Hostname*`:`*Port-Number*`/rbacx/welcome.action`

    When the Welcome screen appears, enter your `rbacxadmin` user name and password and verify that the installation is successful.
21. Open the `rbacx.log` file and check for errors.

    The installation is successful if the following message appears in the `rbacx.log` file:

    ```
    Oracle Identity Analytics (build: 11.1.1.3.0.20100727_21_7842) Started
    ```
22. `Role Provisioning` and `Identity Audit` rules are automatically migrated by Oracle Identity Analytics when started for the first time. The migration jobs should be disabled for any subsequent restarts. To disable the jobs, navigate to the `rbacx.war` directory exploded by the application server and locate `scheduling-context.xml` under `rbacx\WEB-INF`. Open it using a text editor and find bean id `quartzSchedulerFactoryBean`.
    a. Examine the `jobDetails` list. Comment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.
    b. Examine the `triggers` list. Comment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`.

To Upgrade the Environment on a UNIX Platform for a Clustered Deployment

Use the following steps to upgrade Oracle Identity Analytics manually on a supported UNIX platform.

1. Stop the application server.
2. Update the Oracle Identity Analytics database.
3. Type the following commands in the test environment:

    `export INSPATH=`*Path to the upgrade software* (For example, `export INSPATH=/opt/RM_Upgrade`)

    `export RBACXWAR=`*Path to the Oracle Identity Analytics deployment directory* (For example, `export RBACXWAR=`*Tomcat install directory*`/webapps`)

`export RM_LIB=`*Path to the downloaded third-party library files*. (For example, `export RM_LIB=/opt/RM_Lib`)

`export TEMP=`*Path to the temporary directory*

4. Run the pre-process commands:

   ```
   mkdir $TEMP
   ```

   ```
   cd $TEMP
   ```

   ```
   jar -xvf $INSPATH/rbacx.war
   ```

5. Copy the downloaded third-party library files to the Oracle Identity Analytics library directory.

   ```
   cp $RM_LIB/* $TEMP/WEB-INF/lib
   ```

6. Remove report-related files from the *Oracle Identity Analytics Installation Directory*`/reports` directory.

   ```
   /usr/bin/rm -f $RBACX_HOME/reports
   ```

7. Copy the target Oracle Identity Analytics version-specific reports based on the database server to the *Oracle Identity Analytics Installation Directory*`/reports` folder.

   The following sample steps assume that the target database server is MySQL.

   ```
   cp -R $INSPATH/reports $RBACX_HOME/.
   ```

   ```
   cp -R $RBACX_HOME/reports/mysql/* $RBACX_HOME/reports/.
   ```

8. Remove search-related files from the *Oracle Identity Analytics Installation Directory*`/.indexes` directory.

   ```
   /usr/bin/rm -f $RBACX_HOME/.indexes
   ```

9. Copy the files related to advanced search from the upgrade folder to *Oracle Identity Analytics Installation Directory*`/.indexes`

   ```
   cp -R $INSPATH/.indexes $RBACX_HOME/.
   ```

10. Make changes to the following files located under `$INSPATH/conf` directory to reflect customizations as documented in "Documenting Custom Components" on page 53.

    - **iam.properties** - In a text editor, replace any occurrences of `$RBACX_HOME` with the Oracle Identity Analytics installation directory path.

      Note: When the application server is clustered, the nodes can maintain localized import/export directories, or utilize import/export directories on a NFS share. If the nodes use a shared NFS location for import/export, substitute `$RBACX_HOME` with the path to the NFS share.

    - **jdbc.properties**

      - In a text editor, edit the following lines, substituting $SERVER_NAME and $PORT_NUMBER with the host name and connectivity port of the target database. Refer to "UNIX: To Create the Oracle Identity Analytics Schema on the Database Server" on page 24 for instructions.

- Make the following change to `jdbc.properties` for clustered Quartz support, and save the file:

  ```
  jdbc.quartz.isClustered=true
  ```

- **ldap.properties** - Refer to *Authenticating With LDAP* for instructions on LDAP customizations.
- **rm_idm_init.xml** - This file is required by Oracle Identity Analytics to exchange and manage information with Identity Manager.

11. Remove the configuration related directory from *Oracle Identity Analytics Installation Directory* directory

    ```
    /usr/bin/rm -f $RBACX_HOME/conf
    ```

12. Copy configuration directory and files from the upgrade directory to the *Oracle Identity Analytics Installation Directory* directory.

    ```
    cp -R $INSPATH/conf $RBACX_HOME/.
    ```

13. Apply any customizations necessary for the environment to the extracted `.war` file in the `$TEMP` directory.
14. Make the following changes to enable Oracle Identity Analytics support for clustered application server deployments.
    a. Navigate to `$TEMP/WEB-INF` directory.
    b. In a text editor, open `application-context.xml`, find bean id `commManager`, and examine the `constructor-arg` value.
    c. Set the `constructor-arg` value as the cluster name-for example, `value="Prod-1-Cluster"`.
       - If Oracle Identity Analytics is deployed on multiple clusters within the same subnet, you should define unique `constructor-arg` values for each deployment. For example, if both clusters `Prod-Cluster` and `QA-Cluster` have Oracle Identity Analytics deployed, the `constructor-arg` values of each should be set to `Prod-Cluster` and `QA-Cluster` respectively.
       - Members of the same cluster should have the same `constructor-arg` value.
    d. In a text editor, open `search-context.xml`, find bean id `searchConfiguration`, and examine the `constructor-arg` value.
       - For a clustered deployment, `constructor-arg` defaults to a value of `1` or `2` depending on the location of the `.indexes` directory.
         i. To set the `constructor-arg` value, do the following:
            - If each clustered node will be accessing *local* individual `.indexes` directories, set `constructor-arg` to `1`. For example, `value="1"`
            - If clustered nodes will be accessing *a shared*

              ```
              .indexes
              ```

directory, set `constructor-arg` to 2. For example, `value="2"`. The `.indexes` directory needs to be located on an NFS share location where each clustered node has read-write permission. Edit `indexLocation` such that the NFS share location replaces `$RBACX_HOME` in the `value` field.

e. If multiple instances of Oracle Identity Analytics, standalone or clustered, exist on the same subnet, navigate to the `$TEMP/WEB-INF/classes` directory and do the following:

i. In a text editor, open `oscache.properties` (located in the `$TEMP/WEB-INF/classes` directory), and find the `cache.cluster.multicast.ip` property.

ii. Uncomment `cache.cluster.multicast.ip` by removing `#` at the start of the line. Each non-member instance requires a unique `cache.cluster.multicast.ip` value.

15. To migrate `Role Provisioning` and `Identity Audit` rules, open `scheduling-context.xml` using a text editor and find bean id `quartzSchedulerFactoryBean`.

a. Examine the `jobDetails` list. Uncomment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.

b. Examine the `triggers` list. Uncomment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`

16. Repackage the `.war` file in the `$TEMP` directory if changes are made. Type the following commands in the test environment:

```
cd $TEMP
jar -cvfM $RBACXWAR/rbacx.war .
```

17. Uninstall Oracle Identity Analytics from the application server.

18. Deploy the rebuild Oracle Identity Analytics `.war` file on target application server.

Refer to Chapter 4, "Deploying Oracle Identity Analytics," for instructions on Oracle Identity Analytics deployment.

19. Start the application server.

20. Go to the following address in a browser:
`https://`*Hostname*`:`*Port-Number*`/rbacx/welcome.action`

When the Welcome screen appears, enter your `rbacxadmin` user name and password and verify that the installation is successful.

21. Open the `rbacx.log` file and check for errors.

The installation is successful if the following message appears in the `rbacx.log` file:

```
Oracle Identity Analytics (build: 11.1.1.3.0.20100727_21_7842) Started
```

22. `Role Provisioning` and `Identity Audit` rules are automatically migrated by Oracle Identity Analytics when started for the first time. The migration jobs should be disabled for any subsequent restarts. To disable the jobs, navigate to the `rbacx.war` directory exploded by the application server and locate `scheduling-context.xml` under `rbacx/WEB-INF`. Open it using a text editor and find bean id `quartzSchedulerFactoryBean`.

a. Examine the `jobDetails` list. Comment `rmeRuleMigrationJob` and `identityAuditDataMigrationJob`.

b. Examine the `triggers` list. Comment `rmeRuleMigrationJobTrigger` and `identityAuditDataMigrationTrigger`.

To Restore Customization after the Upgrade

1. Once the upgrade process is complete, set up the customized repository objects to restore application customizations.

Testing the Upgrade Deployment Package

Testing is a crucial step before deploying the upgraded image to the production environment.

To Develop and Execute a Test Plan

Create and execute an effective test plan for the development package. A generic test plan should include the following items.

1. Introduction
   - Description of this document
   - Related documents
   - Schedule and milestones
2. Resource requirements
   - Hardware
   - Software (test tools)
3. Features to test / test approach
   - New features testing
   - Regression testing
4. Features not to test
5. Test deliverables
6. Dependencies / risk

To Record All Changes

It is important to document all changes that occur during the test upgrade. Consider documenting the following during the test upgrade process:

- List the version control system in use

- Verify that all existing customizations are tagged and stored in the version
- Control system
- Check all new customizations after completing the test upgrade cycle
- Create an image that consists of all the changed objects that Oracle Identity Analytics stored in the test system during the test upgrade. Deploy this image into production after upgrading the production environment.

◆ ◆ ◆ CHAPTER 9

Upgrading Oracle Identity Analytics in a Production Environment

Upgrading Oracle Identity Analytics in the production environment involves the following two steps:

- Developing a production rollout plan
- Deploying the upgrade in a production environment

Developing a Production Rollout Plan

To develop a successful production rollout plan, incorporate the information gathered while upgrading the test environment based on the following guidelines:

1. Create and document the production deployment image. Import any upgraded objects and files (not the entire environment) from the test environment. Create a deployment image that is compatible with the development process
2. Create workflows and email templates
3. Document any amendments to the plan, including special procedures that apply to the production environment. For example:
   - Scheduling an outage for the application
   - Scheduling database administrator support
   - Notifying users before taking the system offline
   - Shutting down specific resources, processes, or applications that are used in production

Before Beginning the Upgrade Process

Before starting to upgrade Oracle Identity Analytics in a production environment, create a backup of the production data.

To Back Up Production Data

1. Stop all processes and all client access, and shut down Oracle Identity Analytics.
2. Take a baseline snapshot of the file system objects, the operating system, the JDK software, the repository, and the Web applications.
3. Clean up any unnecessary files and hotfixes.

Deploying the Upgrade in a Production Environment

This section provides instructions for deploying the Oracle Identity Analytics upgrade in a production environment.

To Deploy the Upgrade

1. Deploy from the packaged development environment.
2. Import any modifications based on differences between the test and production environments.
3. Migrate a copy of `jdbc.properties` that is suitable for a production environment.
4. Upon successfully deploying Oracle Identity Analytics to the application server, go to the following address in a browser : `https://`*Hostname*`:`*Port-Number*`/rbacx/welcome.action`

   When the Welcome screen appears, enter your `rbacxadmin` user name and password and verify that the installation is successful.
5. Open the `rbacx.log` file and check for errors.

   The installation is successful if the following message appears in the `rbacx.log` file:

   ```
   Oracle Identity Analytics (build: 11.1.1.3.0.20100727_21_7842) Started
   ```