

Sun Role Manager 4.1

Upgrade Guide



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Preface

This guide provides detailed information and step-by-step instructions on upgrading the Sun™ Role Manager Identity Management and Compliance product.

Role Manager Overview

The Sun Role Manager software (formerly Vaau's RBACx product) is a comprehensive Identity Management and Compliance solution that enables companies to proactively enforce internal security control policies and automate critical identity management processes.

The Sun Role Manager software (Role Manager) is based on the Java™ 2 Platform, Enterprise Edition (J2EE™ platform), utilizing a 3-tiered model. Requirements of the 3-tier architecture are a web server, an application server and a database server. The Role Manager application comes bundled with Apache Tomcat 5.5.16 which serves as both – a web server and an application server. Other Java based application servers such as WebSphere, JBoss, WebLogic etc. are also supported by Role Manager. Supported database servers include Microsoft SQL Server, Oracle®, IBM DB2 etc. Role Manager can be easily integrated on Windows, UNIX® or platforms that are based on the UNIX system.

This guide is designed to provide administrators and technical staff with a comprehensive set of instructions to upgrade Role Manager.

Who Should Use This Guide

This guide is designed for Role Manager administrators, software deployment teams and system administrators who are responsible for installing/upgrading Role Manager on the target systems.

Document Conventions

The following conventions are used in this guide –

Information in ...	Indicates ...
<Italics>	A variable whose value is name of the directory
BOLD TEXT	Information that you must type exactly as shown
TEXT	File name



CHAPTER 1

Overview of the Upgrade Process

This chapter provides an overview of the Sun™ Role Manager software (Role Manager) upgrade process. The information is organized as follows

- Upgrade Advantages
- Upgrade Phases
- Example of a Typical Upgrade

Upgrade Advantages

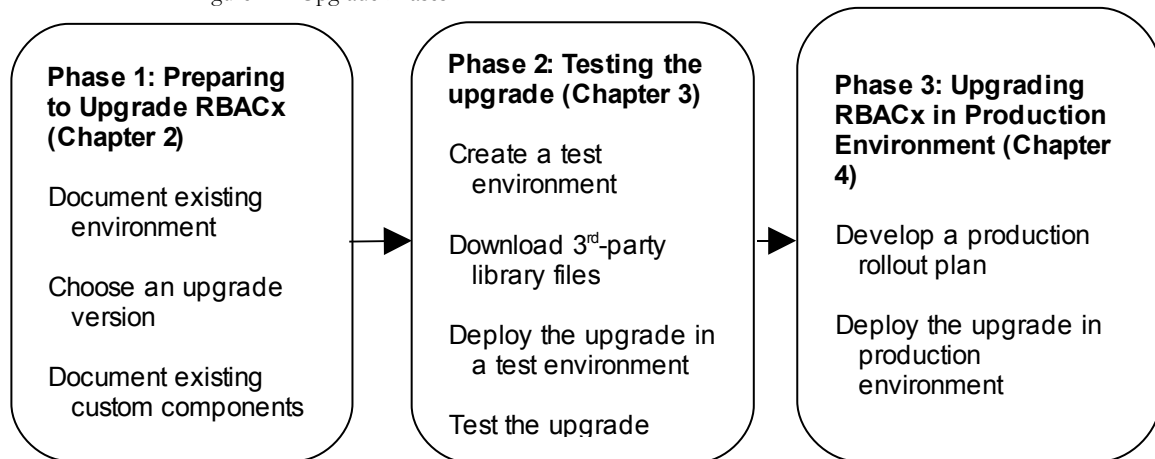
Sun Microsystems provides regular updates of its Role Manager software. Upgrading a release of Role Manager provides numerous advantages, a few of them outlined below

- Access to more advanced features and functionality
- A more secure software for a more secure environment
- Continued eligibility for full support and services

Upgrade Phases

The illustration below lists the major phases of the upgrade process, summarizing the required tasks to be performed for each phase completion. This document provides steps through each phase.

Figure 1-1: Upgrade Phases



Example of a Typical Upgrade

For this example, assume that Role Manager is being upgraded from 4.0 release to 4.1 release.

1. Read following documentation to understand important product changes
 - R Role Manager 4.0 Release Notes
 - R Role Manager Release Notes for the version being upgraded to, in this example Sun Role Manager 4.1 Release Notes.
2. Document existing environment, which includes
 - D Platform - Including setups of application server and database
 - P Role Manager installation - Including file folder locations and configurations
 - R Custom components - Including custom configurations and utilities
3. Backup existing database and Role Manager file structure. Backing up the database and file structure gives the ability to reinstate the working environment back to the previous release, if necessary.
4. Create a test environment that resembles functionality of the production environment
5. Develop a comprehensive test plan. The goal of the test plan is to confirm that all currently utilized product functionality remains operational after the test and before deployment on the production environment
6. Check the version level of the infrastructure components, for e.g. operation system, the JDK software, application server, database, resource etc., to confirm upgraded product support
7. Rebuild any custom java classes and utilities against target product libraries
8. Complete the entire upgrade before attempting to start the application server and resuming activity

Note the following additional considerations –

1. Some releases may require a database schema upgrade. For example, upgrading from Role Manager release 4.0 to 4.1 requires a database schema upgrade. The necessary files would be available in db_scripts folder of the upgrade package.
2. If rbacxmessages.properties is extracted from WEB-INF/classes directory for customized messages, the file needs to be extracted and customized again to reflect the previous customizations
3. For customized logo, create a backup of customer_logo.gif file found under the path <RBACx Expanded .war>/images
4. Any customized report(s) would require a backup from the folder <RBACx Install Directory>/reports
5. If jobs.xml is extracted from <RBACx Expanded .war>/WEB-INF/ directory for customized Cron Expression for User Imports, Account Imports etc. the file needs to be extracted and customized to retain previous customized Cron Expression. It is not recommended to backup and replace jobs.xml on the target release as jobs.xml is subjected to changes in new releases.

Following is a sample Cron Expression –

```
<property name="cronExpression">
    <value>0 0/5 * * * ?</value>
</property>
```

6. It is also recommended to extract scheduling-context.xml file located under <RBACx Expanded.war>/WEB-INF/ for customized triggering/scheduling. To reflect previous customizations, its required that customized changes be made in target release scheduling-context.xml file. Following is a sample extract that would require changes in target release scheduling-context.xml

```
<property name="jobDetails">
    <list>
        <!--ref bean="usersImportJob"/-->
        <!--ref bean="accountsImportJob"/-->
        <!--ref bean="rolesImportJob"/-->
        <!--ref bean="glossaryImportJob"/-->
        <!--ref bean="policiesImportJob"/-->
        <!--ref bean="certificationReminderJob"/-->
        <!--ref bean="reportReminderJob"/-->
        <!--ref bean="stableFolderCleanUpJob"/-->
        <!--ref bean="accountsMaintenanceJob"/-->
        <!--ref bean="roleMembershipRuleJob"/-->
        <ref bean="fullTextIndexMaintenancedJob"/>
        <ref bean="workflowStepSLAJob"/>
        <ref bean="roleMembershipJob"/>
    </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="certificationReminderTrigger"/-->
        <!--ref bean="reportReminderTrigger"/-->
        <!--ref bean="stableFolderCleanUpTrigger"/-->
        <!--ref bean="accountsMaintenanceTrigger"/-->
        <!--ref bean="roleMembershipRuleTrigger"/-->
        <ref bean="fullTextIndexMaintenanceTrigger"/>
        <ref bean="workflowStepSLATrigger"/>
        <ref bean="roleMembershipJobTrigger"/>
    </list>
</property>
```

```
        </list>  
</property>
```




Preparing to Upgrade Role Manager

This section describes how to prepare to upgrade Role Manager. The information is organized as follows

- Documenting the existing environment
- Choosing the upgrade version

Documenting the existing environment

Upgrading to a more-recent Role Manager release might affect the setup of the current environment. By assessing and documenting the platform, Role Manager installation, and custom work as described in this section, the best path and the extent of upgrade complexity can be determined.

Document Existing Platform

To determine the best upgrade path, record the current environment settings, including –

- Application Servers
- Database Servers
- Java Runtime Environment
- Supported Resources
- Web Servers

Application Servers

Record the application server version and note any additional service packs. In addition, record the following –

- Operating system version and service packs installed (if any)
- Java Development Kit (JDK) required by the application server

Database Servers

Record the database server version and note any additional service packs.

Java Runtime Environment

Record the current installed JDK

Supported Resources

Record supported resources name, versions, and any installed service packs. Supported resources would include integrated provisioning servers.

Web Servers

Record the web server and note any additional service pack

Document Role Manager Installation

The following section describes methods for collecting the following information –

- Role Manager release and build version

Role Manager Version

The Role Manager release and build versions can be obtained by navigating to the following directory

<SRM Installation directory>/META-INF

In this directory, locate the file MANIFEST.MF and view in a text-editor. The tag “Implementation-Version” displays the Role Manager release version, for e.g.

Implementation-Version: 4.1.0.20080903_406_3061

Another source to capture the Role Manager version information is from the log files, which states the Role Manager version once the application is started.

Document Custom Components

This section describes methods to record custom components including –

- Custom File-System Objects
- Custom Repository Objects

Custom File-System Objects

It may be required to upgrade custom file-system objects for proper functionality with later Role Manager releases. List any customized file-system objects in the environment including –

- Modified JavaServer Pages™ (JSP™ technology)
- Modified rbacxmessages.properties File
- Customized Property Files
- Customized Resource Adapters (and Other Custom Java)
- Custom Utilities

Modified JSPs

Recent Role Manager versions might include API changes. If JSP software has been modified in installation, it would have to be updated when upgrading. Any JSP that was shipped with the product and changed during a deployment (or a custom JSP that uses Role Manager APIs) must be changed to work with the new JSP structure and API changes for the target release

Modified rbacxmessages.properties File

Record any changes made to default rbacxmessages.properties file

Customized Property Files

Record any changes made to other property files on the system

Customized Resource Adapters (and Other Custom Java)

Customized resource adapters may require recompilation, depending on the target Role Manager version. All custom Java that uses Role Manager APIs (including custom resource adapters) require a recompile during upgrading. Also, consider other Java classes that use the Role Manager library.

Custom Utilities

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

Custom Repository Objects

It may be required to upgrade custom repository objects for proper functionality with later Role Manager releases. Record customized repository objects in the environment including –

- Modified Email Templates
- Custom Repository Schema
- Custom Reports
- Custom Cron Expression
- Custom Import Triggers

Modified Email Templates

Custom email templates may require an export to take advantage of current product enhancements

Custom Repository Schema

If upgrading from an earlier version of Role Manager to the target version requires a schema change, then a schema update is required

Custom Reports

Any custom reports extracted from <RBACx Install Directory>/reports would have to be merged with reports of the target version

Custom Cron Expression

Custom Cron expression would have to be merged into jobs.xml in the target version. NOTE: any occurrence of REPLACE_ME needs to be changed to FILE_SERVER for feeds imported through CSV

Custom Import Triggers

Custom import trigger expression extracted from the previous release of scheduling-context.xml would need to be merged into scheduling-context.xml of the target version, and uncomment necessary regular import triggers

Open the following files under the directory <RBACx Expanded .war>/WEB-INF using a text editor and replace any occurrences of \$RBACX_HOME with <RBACX Install Directory>, for e.g.

```
C:\Program Files\Sun\RM_4.1      (Windows Platform)
/opt/Sun/RM_4.1                  (UNIX Platform)
```

Files to be modified –

1. conf-context.xml, lines to be modified –

```
<property name="locations">
    <list>
        <value>file:/$RBACX_HOME/conf/jdbc.properties</value>
        <value>file:/$RBACX_HOME/conf/mail.properties</value>
        <value>file:/$RBACX_HOME/conf/ldap.properties</value>
        <value>file:/$RBACX_HOME/conf/iam.properties</value>
    </list>
</property>
.
.
.
<property name="basenames">
    <list>
        <value>file:/$RBACX_HOME/conf/serverMessages.properties</value>
    </list>
</property>
.
.
.
<property name="basenames">
```

```
        <list>
          <value>file:/$RBACX_HOME/conf/customMessages.properties</value>
        </list>
      </property>
      .
      .
      .
    <property name="basenames">
      <list>
        <value>file:/$RBACX_HOME/conf/customImages.properties</value>
      </list>
    </property>
    <property name="resourceBasePath">
      <value>file:/$RBACX_HOME/resources/images</value>
    </property>
```

2. reporting-context.xml, lines to be modified –

```
<property name="reportLocation">
  <value>file$RBACX_HOME/reports</value>
</property>
```

3. search-context.xml, lines to be modified -

```
<bean name="fullTextSearchEngine"
class="com.vaau.commons.search.searchengine.solr.EmbeddedSolrSearchEngine">

  <constructor-arg index="0" value="$RBACX_HOME/.indexes/" />

</bean>
```

4. Open workflows.xml file under <RBACx Expanded .war>/WEB-INF/classes directory using a text editor and replace any occurrences of \$RBACX_HOME with <RBACX Install Directory>

```
<workflows>
  <workflow name="Role Creation Workflow" type="file"
location="$RBACX_HOME/conf/workflows/role-creation-workflow.xml"/>
  <workflow name="Role Modification Workflow" type="file"
location="$RBACX_HOME/conf/workflows/role-modification-workflow.xml"/>
  <workflow name="Role Membership Workflow" type="file" location="$RBACX_HOME/
conf/workflows/role-user-membership-workflow.xml"/>
  <workflow name="Mass Modification Workflow" type="file"
location="$RBACX_HOME/conf/workflows/mass-modification-workflow.xml"/>
  <workflow name="Policy Creation Workflow" type="file" location="$RBACX_HOME/
conf/workflows/policy-creation-workflow.xml"/>
  <workflow name="Policy Modification Workflow" type="file"
location="$RBACX_HOME/conf/workflows/policy-modification-workflow.xml"/>
</workflows>
```

Choose an Upgrade Version

After completing inventory assessments, it must be decided which Role Manager version fulfills the requirements. Some users prefer the latest version, while others prefer more mature versions that already have service packs available. In general, one should upgrade to the most recent Role Manager release that is available during the testing time frame.

After choosing the target Role Manager release, it should be determine whether the current platform is supported at the upgrade level

- Read the Release Notes for the target Role Manager release
- Read the known issues to determine whether to upgrade the operating system, JDK software, application server, or any resources.



Upgrading Role Manager in a Test Environment

This section provides guidelines for setting up and deploying the upgrade in a test environment. The information is organized as follows

- Creating a Test Environment
- Download 3rd-Party Library Files
- Preparing to Upgrade the Test Environment
- Deploying the Upgrade in a Test Environment
- Testing the Upgrade Deployment Package

Creating a Test Environment

The test environment being setup should mimic the production environment as closely as possible. Duplicate the following items, using the same hardware and software versions for the test environment that's used in the production environment –

- Application Server
- Database Server
- Web Server (optional component)
- Common client machine with the corporate image and browser
- Resources and other integrated applications
- Role Manager version and configuration

Download 3rd-Party Library Files

For proper functionality of the target Role Manager release, a few 3rd-party files are required to be downloaded prior to any upgrade process. Assume that all the downloaded libraries are placed in a folder named as

```
C:\Sun\RM_4.1\RM_Lib (Windows Platform)
/opt/Sun/RM_4.1/RM_Lib (UNIX Platform)
```

The location where the files have been downloaded would be referred as \$RBACX_LIB

- Download weka.jar file from http://dlc.sun.com/rolemanager/Data_Mining/weka/for_rbacx-4.1.x
This file is required to carry out any role-mining related functionality of Role Manager
- Based on the type of database implemented, corresponding drivers the support the JDBC™ API (JDBC drivers) have to be downloaded and setup on target system. The .jar files necessary for establishing a JDBC connection are available on Sun's Support FTP. The files can be downloaded from http://dlc.sun.com/rolemanager/Database_Drivers

The following table shows information about on or more .jar files needed to be copied for your database type.

Database Type	File Name
Microsoft SQL Server	jtds-1.2.jar
Oracle	ojdbc14.jar
IBM DB2	db2jcc.jar, db2jcc_license_cu.jar
MySQL	mysql-connector-java-5.1.5-bin.jar

- Upon identifying the type of Provisioning Servers integrated to the application, corresponding library files would have to be downloaded from http://dlc.sun.com/rolemanager/Provisioning_Server_Connectivity

Preparing to Upgrade the Test Environment

Before upgrading the Role Manager installation in the test environment, perform the following tasks

1. Backup the current Role Manager installation
2. Rename customized Role Manager repository objects
3. Verify the environment

Backup the Current Role Manager Installation

Before updating, it is important to back up both the directory where Role Manager is installed and the database that Role Manager is using. A third-party backup software or a backup utility supplied with the operating system can be utilized to backup Role Manager file system. To back up the database, refer to the database documentation for recommended backup procedures.

Before creating backups, it's recommended to shut-down the Role Manager instance running on the system. Then, use the backup utilities to back up the database and the file system where Role Manager is installed.

Rename Customized Role Manager Repository Objects

Role Manager 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.

Verify the Environment

Before upgrading Role Manager in the test environment, verify the following –

- Verify all servers are present on the network
- Verify the schema is up-to-date
- Verify the location of Role Manager application

Deploying the Upgrade in a Test Environment

This section explains how to deploy an upgrade in a test environment. The information is organized as follows –

- Upgrade the environment
- Restore customization after the upgrade

Upgrade the Environment

The instructions in the following sections use commands that are specific to a Windows installation and a Tomcat application server. Depending on the environment and application server, the commands may differ slightly.

On a Windows Platform

Use the following steps to upgrade Role Manager manually on a supported Windows platform –

1. Stop the application server
2. Update the Role Manager database
3. Enter the following commands on the test environment –

```
set INSPATH=Path of upgrade software, e.g. C:\RM_Upgrade
```

```
set RBACXWAR=Path to SRM deployment directory.
```

```
For e.g.: <tomcat install directory>\webapps
```

```
set RM_Lib=Path to downloaded 3rd-party library files
```

```
set RBACXHOME=Path to SRM installation directory.
```

```
For e.g.: C:\Program Files\Sun\RM_4.1
```

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

4. Run pre-process

```
mkdir %TEMP%
```

```
cd /d %TEMP%
```

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

5. Copy downloaded 3rd-party library files to the Role Manager library folder

```
copy %RM_Lib%\*. * %TEMP%\WEB-INF\lib
```

6. Remove report-related files from <SRM Installation Directory>\reports folder

7. Copy target Role Manager version specific reports (based on the database server) to <SRM Installation Directory>\reports folder. For the steps below, its assumed that target database server is of type MySQL

```
copy %INSPATH%\reports\mysql\*. * %RBACXHOME%\reports
```

8. Copy advanced search related files from upgrade folder to <SRM Installation Directory>\conf

```
xcopy %INSPATH%\conf\indexes\*. * %RBACXHOME%\conf\indexes\
```

9. Copy workflow related files from upgrade folder to <SRM Installation Directory>\conf

```
xcopy %INSPATH%\conf\workflows\*. * %RBACXHOME%\conf\workflows\
```

9. Open iam.properties file under <SRM Installation Directory>\conf using a text editor. Replace any occurrences of \$RBACX_HOME with <SRM Installation directory> path

10. Modify the following files replacing \$RBACX_HOME with <SRM Installation directory> path as described on page 10 – 11

■ conf-context.xml (located under %TEMP%\WEB-INF)

■ reporting-context.xml (located under %TEMP%\WEB-INF)

- search-context.xml (located under %TEMP%\WEB-INF)
 - workflows.xml (located under %TEMP%\WEB-INF\classes)
11. Apply any customization necessary for the environment to the extracted .war file in %TEMP% directory
 12. Remove Role Manager files from the application server work directory
 13. Repackage .war file in %TEMP% directory if changes are made as outlined in step 5. Enter the following commands on the test environment –

```
cd %TEMP%
```

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

14. Start the application server
15. Address the following URL `http(s)://APPSERVERNAME:PORT/rbacx/welcome.action`. When the Welcome screen appears, enter rbacxadmin credentials and check if the installation is successful.
16. View rbacx.log to check if you have received any errors. If rbacx.log states the following, then the installation is successful.

```
23:04:11,071 INFO [ContextLifecycleListener] Sun Role Manager (build:
4.1.0.20080902_406_3061) Started
```

On a UNIX Platform

Use the following steps to upgrade Role Manager manually on a supported UNIX platform –

1. Stop the application server
2. Upgrade the Role Manager database
3. Enter the following commands on the test environment –

```
export INSPATH=Path of upgrade software, e.g. /opt/RM_Upgrade
```

```
export RBACXWAR=Path to SRM deployment directory.
```

For e.g.: `<tomcat install directory>/webapps`

```
export RM_Lib=Path to downloaded 3rd-party library files
```

```
export RBACXHOME=Path to SRM Installation directory.
```

For e.g.: `/opt/Sun/RM_4.1`

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

4. Run pre-process

```
mkdir $TEMP
```

```
cd $TEMP
```

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

5. Copy downloaded 3rd-party library files to the Role Manager library folder

```
cp $RM_Lib/*.* $TEMP/WEB-INF/lib/.
```

6. Remove report-related files from `<SRM Installation Directory>/reports` folder
7. Copy target Role Manager version specific reports (based on the database server) to `<SRM Installation Directory>/reports` folder. For the steps below, it's assumed that target database server is of type MySQL

```
copy $INSPATH/reports/mysql/*. * $RBACXHOME/reports/.
```

8. Copy advanced search related files from upgrade folder to <SRM Installation Directory>\conf

```
mkdir $RBACX_HOME/conf/.indexes
```

```
cp $INSPATH/conf/.indexes/*. * $RBACXHOME/conf/.indexes/.
```

9. workflow related files from upgrade folder to <SRM Installation Directory>/conf

```
mkdir $RBACXHOME/conf/workflows
```

```
cp $INSPATH/conf/workflows/*. * $RBACXHOME/conf/workflows/.
```

9. Open iam.properties file under <SRM Installation Directory>\conf using a text editor. Replace any occurrences of \$RBACX_HOME with <SRM Installation directory> path

10. Modify the following files replacing \$RBACX_HOME with <SRM Installation directory> path as described on page 10 – 11

- conf-context.xml (located under \$TEMP/WEB-INF)

- reporting-context.xml (located under \$TEMP/WEB-INF)

- search-context.xml (located under \$TEMP/WEB-INF)

- workflows.xml (located under \$TEMP/WEB-INF/classes)

11. Apply any customization necessary for the environment to the extracted .war file in \$TEMP directory

12. Remove Role Manager files from the application server work directory

13. Repackage .war file in \$TEMP directory if changes are made as outlined in step 5. Enter the following commands on the test environment **t** –

```
cd $TEMP
```

```
jar -cvfm %RBACXWAR%/rbacx.war .
```

14. Start the application server

15. Address the following URL [http\(s\)://APPSERVERNAME:PORT/rbacx/welcome.action](http(s)://APPSERVERNAME:PORT/rbacx/welcome.action). When the Welcome screen appears, enter rbacxadmin credentials and check if the installation is successful.

16. View rbacx.log to check if you have received any errors. If rbacx.log states the following, then the installation is successful.

```
23:04:11,071 INFO [ContextLifecycleListener] Sun Role Manager (build:
4.1.0.20080902_406_3061) Started
```

Restore Customization After Upgrade

Once the upgrade process has been completed, setup the customized repository objects to restore customization of the application.

Testing the Upgrade Deployment Package

Testing is crucial before deploying the development upgrade image to the production environment.

Develop and Execute Test Plan

Create and execute an effective test plan for the development package. A generic test plan includes –

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

Document All Changes

It is very important to document all changes that occurred during the test upgrade. When documenting the test upgrade process, consider the following –

- List the version control system used
- Verify that all existing customizations are tagged and stored in the version control system
- Check in all new customizations after completing the test upgrade cycle,
- Create an image that consists of all the changed objects Role Manager stored in the test system during the test upgrade. Deploy this image into production after upgrading the production environment



Upgrading Role Manager in the Production Environment

This section contains information and suggestions for upgrading the production environment. It contains the following sections –

- 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 with the following basic guidelines –

- t 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.
- c Create workflows, and email templates.
- C Document any amendments to the plan, which includes documenting other 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

Deploying the Upgrade in a Production Environment

This section provides instructions for deploying the Role Manager upgrade into the production environment.

Before Beginning Upgrade Process

Before starting to upgrade Role Manager in a production environment, it is necessary to backup the production data –

1. Stop all processes and all client access, and then shutdown Role Manager.
2. Take a baseline snapshot of the file system objects, operating system, JDK software, repository, and Web applications
3. Clean up unnecessary files and hotfixes

Deploy the Upgrade

Perform the following steps to deploy the Role Manager upgrade –

1. Deploy from the packaged development environment
2. Import any modifications based on differences between test and product environments
3. Remember to migrate jdbc.properties suitable for production environment.
4. On successful deployment on the application server, address the following URL to check if the installation is successful:

`http://<APPSERVERNAME>:PORT/rbacx/welcome.action`