

Oracle® Fusion Middleware

Upgrading SOA Suite and Business Process Management

12c (12.2.1)

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This guide provides instructions for upgrading and redeploying your Oracle SOA Suite 11g applications to Oracle SOA Suite 12c.

Oracle Fusion Middleware Upgrading SOA Suite and Business Process Management, 12c (12.2.1)

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Preface

The following topics describe the intended audience, typographical conventions and additional resources that may be helpful during the upgrade process:

[Audience](#)

[Related Documents](#)

[Conventions](#)

Audience

This document is intended for administrators who are familiar with Oracle Fusion Middleware installation, upgrade, and administration tasks.

Related Documents

The following documents provide important pre-upgrade information and should be used in conjunction with the information documented in this guide:

- *Planning an Upgrade of Oracle Fusion Middleware*
- *Understanding Oracle Fusion Middleware*
- *Upgrading with the Upgrade Assistant*
- *Upgrading Oracle WebLogic Server*
- *Upgrading to the Oracle Fusion Middleware Infrastructure*
- *Administering Oracle User Messaging Service*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.

Convention	Meaning
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

What's New in This Guide

The following topics introduce the new and changed features of the Oracle Fusion Middleware upgrade tools and processes.

It also provides information about this book and provides pointers to additional information.

[New and Changed Features for Fusion Middleware 12c](#)

New and Changed Features for Fusion Middleware 12c

Before you begin the upgrade to SOA 12c, review the new features and changes available in Oracle Fusion Middleware 12c. In particular, refer to the following sections in *Understanding Oracle Fusion Middleware*:

- [New and Changed Features for 12c \(12.2.1\)](#)
- [New and Deprecated Terminology for 12c \(12.2.1\)](#)
- [What is the WebLogic Management Framework?](#)
- In 12c, Oracle Fusion Middleware uses a new Reconfiguration Wizard, which upgrades your existing 11g domains to 12c.

For more information, see "Reconfiguring a Domain" in *Upgrading Oracle WebLogic Server*.

Introduction to Oracle SOA Suite and Business Process Management Upgrade

Learn how the upgrade to Oracle Fusion Middleware SOA Suite and Business Process Management 12c is performed. The procedures explain how to upgrade a production version of Oracle SOA Suite 11g or a previous 12c release, including the Oracle Fusion Middleware component configurations in that domain, to this release.

[Understanding the Oracle SOA Suite and Business Process Management Upgrade to 12c](#)

[Understanding the Starting Points for a SOA Suite 12c \(12.2.1\) Upgrade](#)

[Understanding the Interoperability and Compatibility Restrictions Before You Upgrade](#)

[Understanding SOA Domain Upgrade Restrictions](#)

[Understanding the Standard SOA Upgrade Topologies](#)

[Understanding the SOA Suite and BPM Upgrade Process Flow](#)

[Understanding the SOA Suite and BPM Upgrade Procedures](#)

[Understanding How to Use this Guide for Your Upgrade](#)

There are different upgrade paths depending on what is in your pre-upgrade environment. This guide covers all of the supported upgrade paths, so it is important that you understand which procedures to follow.

1.1 Understanding the Oracle SOA Suite and Business Process Management Upgrade to 12c

When upgrading your SOA Suite 11g environment to SOA Suite and Business Process Management 12c (12.2.1), you should understand how your pre-upgrade environment will be affected by the upgrade. For example, schemas and domain directory upgrades are performed "in place" which updates the existing 11g files during the upgrade. The 12c (12.2.1) Oracle Home binaries are upgraded "out of place" as the binaries are installed in a new directory.

The upgrade to 12c (12.2.1) includes the midtier and the schemas. You cannot perform a midtier-only or schema-only upgrade.

The list below describes how the upgrade is performed for the following Infrastructure and SOA Suite components:

- Oracle WebLogic Server, JRF and SOA Oracle Home Binaries - Upgraded Out of Place

You will install the Oracle Infrastructure 12c (12.2.1) (which includes WebLogic Server and JRF) and SOA Suite and Business Process Management 12c (12.2.1) distribution binaries in a new Oracle home. The upgrade of binaries is considered "out of place" as the 11g binaries are not overwritten.

- Schemas - Upgraded In Place

The 11g schemas are upgraded to 12c "in place" which means that the Upgrade Assistant updates and overwrites the schemas during the upgrade process. The servers must be down during this process.

- Instances - Migrated during the schema upgrade

The upgrade of active and closed instances from 11g to 12c happens automatically as part of the schema upgrade. You can manage the upgrade using administration scripts.

- Domain Directory Reconfiguration - Upgraded In Place

The existing SOA domain is upgraded "in place". During the upgrade you will identify the location of the 11g SOA domain and the 11g domain will be reconfigured to point to the new SOA 12c (12.2.1) home directory.

- Domain Component Configuration - Upgraded In Place

After the reconfiguration of the 11g SOA domain, the Upgrade Assistant is used again to upgrade any remaining domain component configurations that require an upgrade in the new SOA 12c (12.2.1) home directory.

Note:

Oracle recommends that you perform your domain upgrades in place. However, if an out-of-place domain upgrade is required, see "Performing an Out-of-Place Domain Directory Upgrade".

1.2 Understanding the Starting Points for a SOA Suite 12c (12.2.1) Upgrade

You can upgrade to Oracle SOA Suite and Business Process Management 12c (12.2.1) from the following production 11g starting points:

- SOA Suite and Business Process Management 12c (12.1.3)
- SOA Suite 11g (11.1.1.9, 11.1.1.7, and 11.1.1.6)
- SOA Suite 11g (11.1.1.5) or earlier - Not Supported

If you are running SOA 11g (11.1.1.5) or earlier, you must first upgrade to SOA 11g (11.1.1.6 or 11.1.1.7) before you can upgrade. For more information, see [Oracle® Fusion Middleware Upgrade Guide for Oracle SOA Suite, WebCenter Portal, and ADF](#) in the Oracle Fusion Middleware 11g (11.1.1.7) upgrade documentation library.

1.3 Understanding the Interoperability and Compatibility Restrictions Before You Upgrade

Before you begin the upgrade process from SOA Suite and BPM 11g to 12c, you must read and understand how all of the components within your 11g domain will be

impacted by the upgrade. *Understanding Interoperability and Compatibility* provides a detailed matrix of which components can and cannot be upgraded together. In general, you cannot upgrade a domain that contains components that are not yet available in Oracle Fusion Middleware 12c (12.2.1). There are other restrictions on the components that can be upgraded to 12c (12.2.1) and you need to be sure that you have reviewed this information carefully before you proceed with the upgrade.

See Also: [Understanding SOA Domain Upgrade Restrictions](#)

1.4 Understanding SOA Domain Upgrade Restrictions

Some domains cannot be upgraded to 12c (12.2.1) because of known limitations and configuration changes from previous Fusion Middleware releases. Review the following to ensure your domains are not impacted by these restrictions. Domains that are impacted by these restrictions cannot be upgraded.

DO NOT ATTEMPT TO UPGRADE A DOMAIN THAT IS UNSUPPORTED.

The following list describes the known SOA domain upgrade restrictions.

- **Domains that include SOA Core Extension cannot be upgraded in-place to 12.2.1.**

If your pre-upgrade environment contains SOA Core Extension, then you cannot upgrade to this release of Oracle Fusion Middleware. An upgrade of SOA Core Extension is not supported in 12c (12.2.1). If you want to include SOA Core Extension in your 12.2.1 domain, you will have to manually migrate the files. Contact Oracle Support for more information.

- **Domains that include the Cloud Adapters Pack should not be upgraded to 12.2.1**

If your 12.1.3 domain includes the Cloud Adapters Pack, you cannot upgrade to 12.2.1.

- **Domains that include Oracle Enterprise Repository cannot be upgraded to 12.2.1**

If your 12.1.3 domain include Oracle Enterprise Repository (OER), you cannot upgrade to 12.2.1.

1.5 Understanding the Standard SOA Upgrade Topologies

This upgrade documentation provides detailed instructions for upgrading two typical SOA Suite configurations. These topologies are referred to as the Oracle Fusion Middleware 12c standard upgrade topologies. Specifically, for the purposes of this guide, a standard installation topology consists of a WebLogic Server domain that contains an Administration Server and a cluster containing two Managed Servers or a standalone domain.

A standalone domain is a container for system components, such as Oracle HTTP Server. It has a directory structure similar to an Oracle WebLogic Server domain, but it does not contain an Administration Server or Managed Servers. It can contain one or more instances of system components of the same type, such as Oracle HTTP Server, or a mix of system component types. For more information on the standalone topology, see *What Is a Standalone Domain?*

Your actual topology may vary, but the topologies described in this guide provide an example that can be used as a guide to upgrade similar SOA Suite component

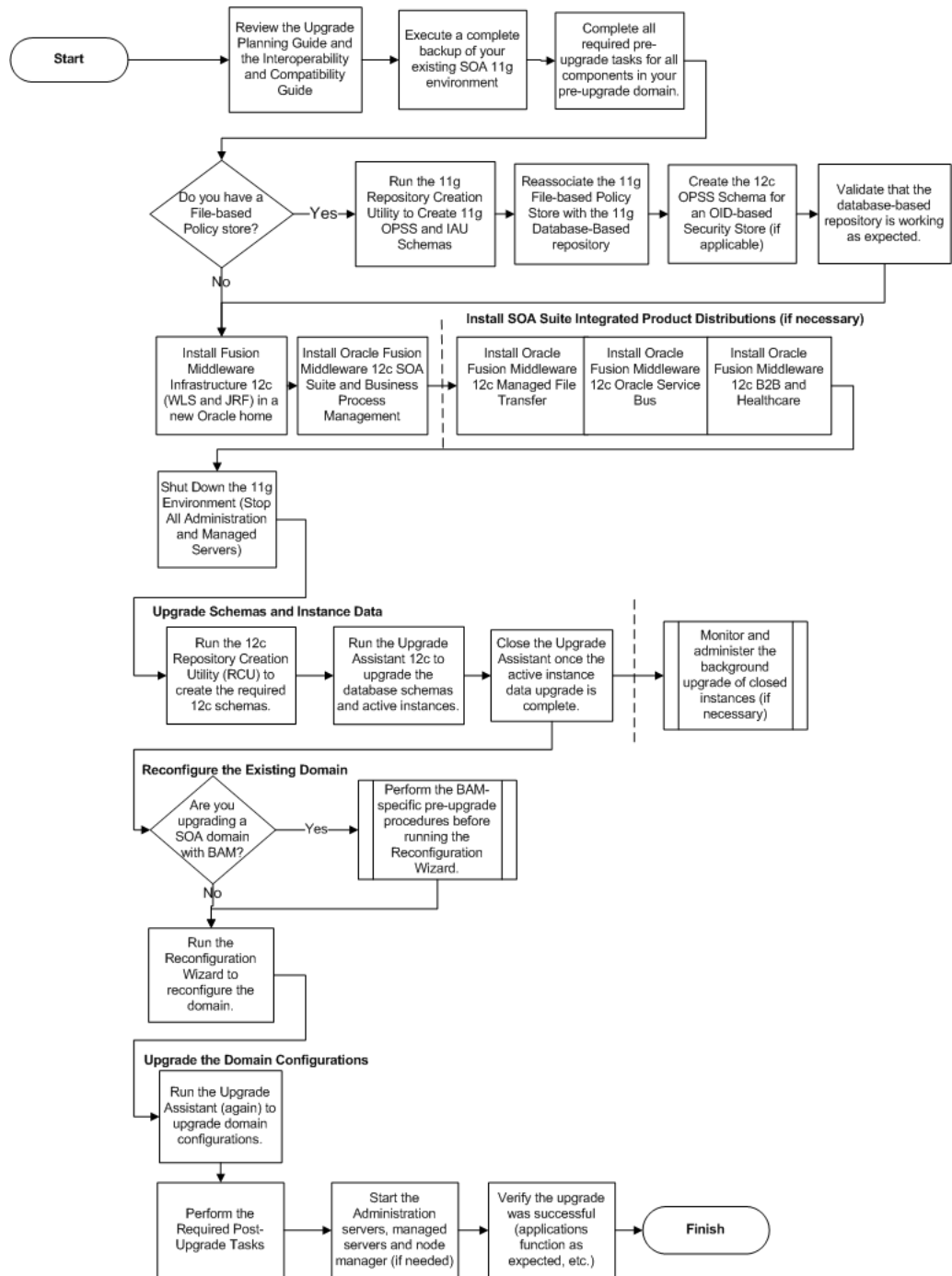
topologies. For more information on the standard topologies and building an enterprise deployment, see *Planning an Installation of Oracle Fusion Middleware*.

For more information on setting up the 12c SOA Suite topologies, see:

- *Installing and Configuring Oracle SOA Suite and Business Process Management*
- *Enterprise Deployment Guide for Oracle SOA Suite*

1.6 Understanding the SOA Suite and BPM Upgrade Process Flow

This section describes the high-level steps for upgrading the Oracle Fusion Middleware SOA Suite:



1.7 Understanding the SOA Suite and BPM Upgrade Procedures

Table 1-1 Task Descriptions for Upgrading Oracle SOA Suite

Table 1-1 (Cont.) Task Descriptions for Upgrading Oracle SOA Suite

Description	More Information
<p>Review the Oracle Fusion Middleware 12c Concepts Guide and the Planning an Upgrade Guide before you begin the upgrade.</p> <p>These guides provide important information about upgrading to Fusion Middleware 12c. You should understand the new 12c terminology changes and new requirements.</p>	<p>See <i>Understanding Oracle Fusion Middleware</i></p> <p>See <i>Planning an Upgrade of Oracle Fusion Middleware</i></p> <p>See <i>Understanding Interoperability and Compatibility</i></p>
<p>Perform ALL applicable pre-upgrade tasks for the Oracle Fusion Middleware environment such as creating a complete backup, reassociating file-based security stores, and verifying system requirements.</p>	<p>Oracle Fusion Middleware 12c Pre-Upgrade Checklist</p>
<p>Perform all of the required pre-upgrade tasks for the components you are upgrading.</p>	<p>For all required pre-upgrade tasks, see the Oracle Fusion Middleware 12c Pre-Upgrade Checklist.</p> <p>For SOA-specific pre-upgrade tasks, see Performing SOA-Specific Pre-Upgrade Tasks</p> <p>For SOA domains that include Oracle BAM, see Performing the Pre-Upgrade Tasks for Oracle BAM</p> <p>When upgrading Oracle Service Bus (with or without Oracle SOA), see Performing Pre-Upgrade Tasks for Oracle Service Bus (OSB)</p>
<p>You must install Fusion Middleware Infrastructure 12c (12.2.1) in a NEW Oracle home on the same host as the 11g production deployment before you begin the upgrade.</p> <p>In 12c, Oracle home is used to describe the 11g Middleware home.</p>	<p>See <i>Installing and Configuring the Oracle Fusion Middleware Infrastructure</i></p> <p>NOTE: Install but do not use the Configuration Wizard to configure the domain. You will use the Reconfiguration Wizard during the upgrade.</p>
<p>Install SOA Suite and Business Process Management 12c (12.2.1) and any integrated SOA-integrated distributions (Oracle HTTP Server, Oracle Service Bus, etc) in your newly created Oracle home.</p>	<p>See Installing Oracle SOA Suite and Business Process Management 12c</p> <p>NOTE: You must install the Fusion Middleware 12c (12.2.1) distributions for each SOA-integrated product you are upgrading. For example, if you are upgrading a SOA 11g environment with Oracle Service Bus, you must acquire the Oracle Service Bus 12c (12.2.1) distribution as well as the Oracle SOA Suite and BPM 12c (12.2.1) distribution. A complete list of distributions is provided in <i>Planning an Installation of Oracle Fusion Middleware</i>.</p>
<p>Shut down the 11g Environment (stop all Administration and Managed Servers)</p>	<p>See Stopping SOA Servers and Processes</p>
<p>Launch the 12c (12.2.1) Repository Creation Utility (RCU) and create the new required 12c schemas.</p>	<p>See Creating the Required SOA Schemas Before You Upgrade from 11g</p>

Table 1-1 (Cont.) Task Descriptions for Upgrading Oracle SOA Suite

Description	More Information
Run the Upgrade Assistant to upgrade the 11g database schemas and to upgrade all active (in flight) instance data to 12c (12.2.1).	See Upgrading Schemas Using the Upgrade Assistant NOTE: The upgrade of active instance data is started automatically when running the Upgrade Assistant. Once the data is successfully upgraded to the new 12.2.1 environment, you can close the Upgrade Assistant. The closed instances will continue to upgrade through a background process. For more information, see Administering and Monitoring the Upgrade of SOA Instances .
You can manage and administer the ongoing upgrade of closed instances using the administration SQL scripts or Oracle Fusion Middleware Enterprise Manager Control.	See Administering and Monitoring the Upgrade of SOA Instances .
NOTE: If the 11g SOA domain that you are upgrading includes Oracle Business Activity Monitoring (BAM), you must complete all of the BAM-specific pre-upgrade tasks before you run the Reconfiguration Wizard. If you do not complete these steps before you attempt to run the Reconfiguration Wizard, then the upgrade will fail.	See Upgrading SOA with Oracle Business Activity Monitoring (Oracle BAM) NOTE: Business Activity Monitoring (BAM) has been completely redesigned in 12c, and requires additional steps before reconfiguring the domain and after the upgrade.
Run the Reconfiguration Wizard to reconfigure the domain and node manager.	See Reconfiguring the Domain Using the Reconfiguration Wizard
Run the Upgrade Assistant (again) to upgrade domain configurations.	See Upgrading the Domain Component Configurations Using the Upgrade Assistant
Perform the required post-upgrade configuration tasks (if needed).	See Performing Post Upgrade Tasks
Start the Administration and Managed Servers and node manager.	See Starting and Stopping Servers
Make sure that all of the upgraded components are working as expected.	See Verifying the Domain Component Configurations Upgrade

1.8 Understanding How to Use this Guide for Your Upgrade

There are different upgrade paths depending on what is in your pre-upgrade environment. This guide covers all of the supported upgrade paths, so it is important that you understand which procedures to follow.

The following table describes the procedures you will use based on your pre-upgrade environment. If your pre-upgrade environment includes other Oracle Fusion Middleware components, such as OracleWebCenter, you must refer to the component-specific upgrade guide for more information. For a complete list of upgrade guides available for this release, see Oracle Fusion Middleware 12c Upgrade Documentation .

If your pre-upgrade environment includes...	Refer to these upgrade procedures:
Required for All Upgrades:	Oracle Fusion Middleware Pre-Upgrade Checklist

If your pre-upgrade environment includes...	Refer to these upgrade procedures:
All upgrades must first complete the required pre-upgrade tasks for Oracle Fusion Middleware AND the component-specific upgrade tasks documented for each upgrade path. Failure to complete the pre-upgrade tasks may result in a failed upgrade.	Performing SOA-Specific Pre-Upgrade Tasks
Oracle SOA Suite and Business Process Management (BPM) 11g	Upgrading to SOA Suite and Business Process Management 12c (12.2.1)
Oracle SOA Suite and Business Process Management (BPM) 12c	Upgrading Oracle SOA Suite and Business Process Management from a Previous 12c Release
Clustered SOA and BPM Environment	Upgrading a Clustered SOA Environment
Oracle SOA Suite with Oracle Business Activity Monitoring (BAM) 11g	Upgrading SOA with Oracle Business Activity Monitoring (Oracle BAM)
Oracle SOA Suite with Oracle Business Activity Monitoring (BAM) 12c	Upgrading Oracle SOA Suite with Business Activity Monitoring (BAM) 12c from a Previous 12c Release
Domain with Oracle Business Activity Monitoring 11g Only	<p>Not Supported — You cannot upgrade a BAM-only domain, but you can Import/Export BAM objects to 12c.</p> <p>Exporting All Oracle BAM 11g Artifacts from the Existing Domain</p>
Oracle Service Bus (OSB) 11g with SOA Suite	Upgrading Oracle Service Bus
Oracle Service Bus (OSB) 11g without SOA Suite	Upgrading an OSB Domain (Without SOA)
Oracle User Messaging Service 11g or 12c	Performing pre-Upgrade Tasks for User Messaging Service (UMS)
SOA Domain with AIAFP 11g or SOA Core Extension 12c	Not Supported

Pre-Upgrade Checklist

You must complete all applicable tasks before you begin the upgrade process. Failure to do so may result in a failed upgrade.

The tasks described in this pre-upgrade checklist assume that you have read *Planning an Upgrade to Oracle Fusion Middleware 12c* and understand the requirements of this upgrade.

Note:

The pre-upgrade procedures you perform depend on the configuration of your existing system, the components you are upgrading, and the environment you want to create at the end of the upgrade and configuration process.

In addition to the common, pre-upgrade procedures described here, you may also have component-specific tasks to perform. Consult your component-specific upgrade documentation for other required procedures.

Table 2-1 *Tasks to Perform Before You Upgrade to Oracle Fusion Middleware 12c*

Task	Description	Documentation
Create a complete backup of your pre-upgrade environment.	REQUIRED FOR ALL UPGRADES. Back up all system-critical files and database(s) that contain any schemas that are to be upgraded before you begin your upgrade. If the upgrade fails, you need to restore your pre-upgrade environment and begin the upgrade again.	Creating a Complete Backup (Required)

Table 2-1 (Cont.) Tasks to Perform Before You Upgrade to Oracle Fusion Middleware 12c

Task	Description	Documentation
<p>Verify that you are installing and upgrading your product on a supported hardware and software configuration.</p> <p>NOTE: Do not attempt an upgrade if you are unable to use the latest supported operating system. As with all supported configurations, failure to comply with these requirements may cause your upgrade to fail.</p>	<p>As part of the upgrade planning process, you already verified that your hardware and software configurations (including operating systems) are supported by the latest certifications and requirements documents.</p> <p>Just before you start the upgrade, verify this information again, as the certification requirements may have changed.</p> <p>Make sure that you have applied the latest patches to your components before you upgrade.</p>	<p>Verifying Certification and System Requirements</p>
<p>Remove any outdated or unused data before you upgrade.</p>	<p>To optimize performance, consider purging data and objects that will not be used in the upgraded environment.</p>	<p>Purging Unused Data</p>
<p>Clone your production environment to use as an upgrade testing platform.</p>	<p>In addition to creating a complete backup of your system files, you should also clone your production environment. This environment can be used to test the upgrade.</p>	<p>Cloning Your Production Environment for Testing (Recommended)</p>
<p>Verify that you are running a 64-bit operating system. Most Oracle Fusion Middleware 12c components require a 64-Bit operating system.</p>	<p>Required only if you are currently running a 32-bit operating system.</p>	<p>Migrating from a 32-Bit to a 64-Bit Operating System</p>
<p>Depending on your upgrade starting point, you may be required to create new 12c schemas before an upgrade.</p>	<p>Oracle Fusion Middleware 12c requires that you use the Repository Creation Utility (RCU) to create new schemas before you can upgrade your existing environment.</p>	<p>Creating the Required Schemas Before an Upgrade</p>
<p>If you are using a file-based policy store, then you must reassociate it to a database-based policy store.</p>	<p>This step is not required if you are upgrading from a previous 12c release.</p>	<p>Reassociating File-based Policy Stores to Database-based Policy Stores (Required)</p>
<p>Understand the schema requirements when using an OID-based security store.</p>	<p>If you are using an OID-based security store, you need to create a 12c OPSS schema before you upgrade.</p>	<p>Creating the 12c OPSS Schema for an OID-based Security Store</p>
<p>Oracle recommends that you maintain the highest level of security for all Fusion Middleware security stores.</p>	<p>Before the upgrade, back up your existing security stores and then upgrade them using the security store-specific procedures.</p>	<p>Upgrading Security Stores to the Latest Version</p>

Table 2-1 (Cont.) Tasks to Perform Before You Upgrade to Oracle Fusion Middleware 12c

Task	Description	Documentation
Some of the security algorithms used in Fusion Middleware 12c require additional policy files for the JDK.	Required only if you plan to use enhanced encryption (such as AES 256). Oracle recommends that you apply the required policy files to the JDK before you upgrade.	Using Enhanced Encryption (AES 256)
Create a new Non-SYSDBA user to avoid running the upgrade as SYS AS SYSDBA.	Oracle recommends that you create a non-SYSDBA user called fmw to run Upgrade Assistant with only those privileges required by the Upgrade Assistant.	Creating a Non-SYSDBA User
Oracle Database Users: Before upgrading an Edition-Based Redefinition (EBR) enabled schema, you must connect to the database server and create an edition on the database server for 12c (12.2.1).	This step is required only if you are using an Edition-Based Redefinition (EBR) database.	Creating an Edition on the Server for Edition-Based Redefinition (Optional)
Download and install the new 12c products in to a new Oracle home before you upgrade.	Install the 12c (12.2.1) versions of the products you already have in your pre-upgrade environment. Note that some products have not yet been released for 12c (12.2.1), but will become available in a future release.	Downloading and Installing the 12c Oracle Fusion Middleware Product Distributions
Run the Readiness Check on your production environment before you begin the upgrade.	The Upgrade Assistant can be run in <code>-readiness</code> mode to detect potential issues that could prevent a successful upgrade.	Running a Pre-Upgrade Readiness Check
Use the component-specific upgrade documentation to complete your upgrade.	The documentation covers component-specific tasks that are required for the upgrade. Some of the tasks are performed before the upgrade and some are performed after. Always consult your Oracle Fusion Middleware upgrade documentation to ensure you have a successful upgrade.	Locating the Component-Specific Upgrade Documentation

[Creating a Complete Backup \(Required\)](#)

Before you install any new 12c distributions and begin upgrading your Oracle Fusion Middleware 11g or 12c deployment, be sure you have backed up all system-critical files; including all of the databases that host your Oracle Fusion Middleware schemas.

[Cloning Your Production Environment for Testing \(Recommended\)](#)

Oracle strongly recommends that you create a copy of your actual production environment, upgrade the cloned environment, verify that

the upgraded components work as expected, and then (and only then) upgrade your production environment.

Verifying Certification and System Requirements

The certification matrix and system requirements documents should be used in conjunction with each other to verify that your environment meets the necessary requirements for installation.

Migrating from a 32-Bit to a 64-Bit Operating System

Most Oracle Fusion Middleware 12c components require a 64-Bit operating system. If you are running a 32-bit environment, then you must migrate your 32-bit environment to a 64-bit software environment before you upgrade.

Purging Unused Data

Purging unused data before an upgrade can optimize the upgrade process. Automated purge scripts are available for some components and can run before an upgrade to purge unused and obsolete data.

Creating the Required Schemas Before Upgrade

Before you upgrade, you may be required to create new schemas for your 12c deployment. To determine which additional schemas need to be created for 12c, compare the component schemas you have in your existing environment to the schemas required for your upgrade.

Reassociating File-based Policy Stores to Database-based Policy Stores (Required)

Oracle Fusion Middleware 12c uses database-based policy stores. A database-based policy store is recommended for a production environment. If you are using a file-based or OID-based policy store, you must reassociate the store to a database-based store prior to upgrade.

Upgrading Security Stores to the Latest Version

Upgrading to the latest version of the OPSS security store enable you to use enhanced features and fixes. OPSS security store is a part of Oracle Fusion Middleware product installation and therefore, you can use the Upgrade Assistant directly to upgrade the OPSS schema.

Creating a Non-SYSDBA User

Oracle recommends that you create a non-SYSDBA user to run the Upgrade Assistant. The user created using this procedure has the privileges required to complete the upgrade.

Using Enhanced Encryption (AES 256)

The Java platform defines a set of APIs spanning major security areas, including cryptography, public key infrastructure, authentication, secure communication, and access control. These APIs allow developers to easily integrate security mechanisms into their application code. If you plan to use enhanced encryption (such as AES 256), Oracle recommends that you apply these policy files to the JDK before you upgrade.

Creating an Edition on the Server for Edition-Based Redefinition (Optional)

Edition-based redefinition enables you to upgrade an Oracle Database component of an application, such as PL/SQL objects, views, and

synonyms, while it is in use, thereby minimizing or eliminating down time.

Maintaining Custom Domain Environment Settings

Every domain includes dynamically generated domain and server startup scripts, such as `setDomainEnv`. Oracle recommends that you do not modify these startup scripts, as any changes made to them are overwritten during subsequent domain upgrade and reconfiguration operations.

Downloading and Installing the 12c Oracle Fusion Middleware Product Distributions

Oracle Fusion Middleware product distributions are available for download on Oracle Technology Network (OTN) and Oracle Software Delivery Cloud.

Using the Upgrade Assistant to Run a Pre-Upgrade Readiness Check

The Upgrade Assistant can be run in the **-readiness** mode to perform a read-only, pre-upgrade check on your domain. If issues are detected, you can correct them before starting the actual upgrade.

Locating the Component-Specific Upgrade Documentation

The component specific upgrade documentation provides upgrade procedure and information for every individual component including Oracle WebLogic Server, Oracle Fusion Middleware Infrastructure, Oracle HTTP Server, Oracle SOA Suite and Oracle Business Process Management, Oracle Webcenter, User Messaging Service, and Oracle Data Integrator.

2.1 Creating a Complete Backup (Required)

Before you install any new 12c distributions and begin upgrading your Oracle Fusion Middleware 11g or 12c deployment, be sure you have backed up all system-critical files; including all of the databases that host your Oracle Fusion Middleware schemas.

For more information, see *Backing Up Your Oracle Fusion Middleware Environment and Upgrading and Preparing Your Oracle Databases for 12c*.

2.2 Cloning Your Production Environment for Testing (Recommended)

Oracle strongly recommends that you create a copy of your actual production environment, upgrade the cloned environment, verify that the upgraded components work as expected, and then (and only then) upgrade your production environment.

Upgrades cannot be reversed. In most cases, if an error occurs, you must stop the upgrade and restore the entire environment from backup and begin the upgrade process from the beginning. Identifying potential upgrade issues in a development environment can eliminate unnecessary downtime.

Note: Cloning procedures are component-specific. At a high level, you will install the pre-upgrade version of your component domain on a test machine, create the required schemas using the Repository Creation Utility (RCU), and perform the upgrade. Depending on what you are upgrading, you may be required to perform additional cloning tasks to replicate your production environment. Your component-specific upgrade documentation provides the complete upgrade procedure.

Additional benefits of running an upgrade in a cloned production environment include the following:

- Uncover and correct any upgrade issues.
- Practice completing an end-to-end upgrade.
- Understand the upgrade performance and how purge scripts can help.
- Understand the time required to complete the upgrade.
- Understand the database resource usage (such as temporary tablespace; PGA, etc).

Note: You can run the pre-upgrade Readiness Check on the cloned production environment to help identify potential upgrade issues with your data, but you must perform a complete test upgrade on a cloned environment to ensure a successful upgrade.

2.3 Verifying Certification and System Requirements

The certification matrix and system requirements documents should be used in conjunction with each other to verify that your environment meets the necessary requirements for installation.

Note: When checking the certification, system requirements, and interoperability information, be sure to check specifically for any 32-bit or 64-bit system requirements. It is important for you to download software specifically designed for the 32-bit or 64-bit environment, explicitly.

Warning: Make sure that your current environment has been patched to the latest patch set BEFORE you begin the upgrade. Certifications are based on fully patched environments unless stated otherwise.

Verify Your Environment Meets Certification Requirements

Oracle has tested and verified the performance of your product on all certified systems and environments. Make sure that you are installing your product on a supported hardware or software configuration

Verify System Requirements and Specifications

It is important to verify that the system requirements such as disk space, available memory, specific platform packages and patches, and other operating system-specific items are met.

Verify that the database hosting Oracle Fusion Middleware is supported

You must have a supported Oracle database configured with the required schemas before you run Fusion Middleware 12c.

Verify that the JDK is certified for this release of Oracle Fusion Middleware.

Before you can install any Oracle Fusion Middleware product using a generic installer, you must download and install a supported JDK on your system.

2.3.1 Verify Your Environment Meets Certification Requirements

Oracle has tested and verified the performance of your product on all certified systems and environments. Make sure that you are installing your product on a supported hardware or software configuration

Whenever new certifications occur, they are added to the proper certification document right away. New certifications can occur at any time, and for this reason the certification documents are kept outside of the documentation libraries and are available on Oracle Technology Network. For more information, see Certification Matrix for 12c (12.2.1).

2.3.2 Verify System Requirements and Specifications

It is important to verify that the system requirements such as disk space, available memory, specific platform packages and patches, and other operating system-specific items are met.

The Oracle Fusion Middleware System Requirements and Specifications document should be used to verify that the requirements of the certification are met. For example, if the certification document indicates that your product is certified for installation on 64-Bit Oracle Linux 7, this document should be used to verify that your Oracle Linux 7 system has met the required minimum specifications, like disk space, available memory, specific platform packages and patches, and other operating system-specific items. This document is updated as needed and resides outside of the documentation libraries. The latest version is available on Oracle Technology Network.

For a complete description of the system requirements for installing and upgrading to Oracle Fusion Middleware 12c, see Review System Requirements and Specifications.

Note: When you install the Oracle Fusion Middleware Release 12c software in preparation for upgrade, you should use the same user account that you used to install and configure the Oracle Fusion Middleware 11g software. On UNIX operating systems, this will ensure that the proper owner and group is applied to new Oracle Fusion Middleware 12c files and directories

2.3.3 Verify that the database hosting Oracle Fusion Middleware is supported

You must have a supported Oracle database configured with the required schemas before you run Fusion Middleware 12c.

It is assumed that you understand the Oracle Database requirements when upgrading and ensure that the database hosting Oracle Fusion Middleware is supported and has sufficient space to perform an upgrade.

2.3.4 Verify that the JDK is certified for this release of Oracle Fusion Middleware.

Before you can install any Oracle Fusion Middleware product using a generic installer, you must download and install a supported JDK on your system.

Make sure that the JDK is installed outside of the Oracle home. The Oracle Universal Installer validates that the designated Oracle home directory is empty, and the install does not progress until an empty directory is specified. If you install JDK under Oracle home, you may experience issues in future operations. Therefore, Oracle recommends that you use install the JDK in the `/home/oracle/products/jdk` directory. You can then use the `java -jar` command to run the installer JAR file.

For more information on the difference between generic and platform-specific installers, see *Understanding the Difference Between Generic and Platform-Specific Distributions* in the *Oracle Fusion Middleware Download, Installation, and Configuration Readme Files*.

To download the required JDK, use your browser to navigate to the following URL and download the Java SE JDK:

<http://www.oracle.com/technetwork/java/javase/downloads/index.html>

2.4 Migrating from a 32-Bit to a 64-Bit Operating System

Most Oracle Fusion Middleware 12c components require a 64-bit operating system. If you are running a 32-bit environment, then you must migrate your 32-bit environment to a 64-bit software environment before you upgrade.

Note: When checking the certification, system requirements, and interoperability information, be sure to check specifically for any 32-bit or 64-bit system requirements. It is important for you to download software specifically designed for the 32-bit or 64-bit environment, explicitly.

Make sure to validate the migration to ensure all your Oracle Fusion Middleware 11g software is working properly on the 64-bit machine, and only then perform the upgrade to Oracle Fusion Middleware 12c.

In these tasks, **host** refers to the 32-bit source machine and **target** refers to the new 64-bit target machine.

Note: These steps assume that your database is located on a separate host and will not be moved.

Upgrading an operating system typically involves the following:

Caution: These steps are provided as an example of the operating system upgrade process and may or may not include all of the procedures you must perform to update your specific operating system. Consult your operating system's upgrade documentation for more information.

Procure the Hardware that Supports your Upgrade's 64-bit Software Requirement

Make sure that you have supported target hardware in place before you begin the upgrade process.

Stop all processes, including the Administration Server, Managed Servers, and Node Manager

You must stop all processes, including the Administration Server, Managed Servers, and Node Manager, if they are started on the host.

Back up all Files from the 32-bit Host Machine

Make sure that you have created a complete backup of your entire 11g deployment before you begin the upgrade process. These files can be used if there is an issue during the migration and you have to restart the process.

Set up the Target 64-bit Machine with the 11g Host Name and IP Address

The host name and IP address of the target machine must be made identical to the host. This requires you to change the IP address and name of the source machine or decommission the source machine to avoid conflicts in the network.

Restore the 11g Backup from 32-bit Host to 64-bit Host

Restore the files you backed up in Task 3 using the same directory structure that was used in 11g. The directory structure on the target machine must be identical to the structure of the host machine.

Install the 12c Product Distribution(s) on the Target Machine

Oracle recommends an Out-of-Place approach for upgrade. Therefore, you must install the 12c product distributions in a new Oracle home on the target machine.

Upgrade the Target 64-bit Environment Using the Standard Upgrade Procedure

After installing the product on the target machine, you must upgrade each component individually using an upgrade utility specified in the component-specific upgrade guide and complete any post-upgrade tasks.

2.4.1 Procure the Hardware that Supports your Upgrade's 64-bit Software Requirement

Make sure that you have supported target hardware in place before you begin the upgrade process.

2.4.2 Stop all processes, including the Administration Server, Managed Servers, and Node Manager

You must stop all processes, including the Administration Server, Managed Servers, and Node Manager, if they are started on the host.

For example, to stop the Administration Server, enter the following command:

```
DOMAIN_HOME/bin/stopWebLogic.sh username password [admin_url]
```

2.4.3 Back up all Files from the 32-bit Host Machine

Make sure that you have created a complete backup of your entire 11g deployment before you begin the upgrade process. These files can be used if there is an issue during the migration and you have to restart the process.

Note: If the upgrade from 32-bit to 64-bit takes place on the same machine, there is a risk of corrupting the source environment if the upgrade fails.

For more information on backing up your 11g files, see [Backing Up Your Environment](#) in *Oracle® Fusion Middleware Administrator's Guide*.

During the upgrade you must have access to the contents of the following:

- 11g Domain Home
- 11g /nodemanager directory located in *MW_HOME/wlserver_10.3/common/*

Some of the backup and recovery procedures described in [Backing Up Your Environment](#) in *Oracle® Fusion Middleware Administrator's Guide* are product-specific. Do not proceed with the upgrade until you have a complete backup.

2.4.4 Set up the Target 64-bit Machine with the 11g Host Name and IP Address

The host name and IP address of the target machine must be made identical to the host. This requires you to change the IP address and name of the source machine or decommission the source machine to avoid conflicts in the network.

The process of changing an IP address and host name varies by operating system. Consult your operating system's administration documentation for more information.

2.4.5 Restore the 11g Backup from 32-bit Host to 64-bit Host

Restore the files you backed up in Task 3 using the same directory structure that was used in 11g. The directory structure on the target machine must be identical to the structure of the host machine.

For detailed information about restoring your 11g files to the 64-bit target machine, see [Recovering Your Environment](#) in *Oracle® Fusion Middleware Administrator's Guide*.

2.4.6 Install the 12c Product Distribution(s) on the Target Machine

Oracle recommends an Out-of-Place approach for upgrade. Therefore, you must install the 12c product distributions in a new Oracle home on the target machine.

For detailed instructions on how to obtain 12c distributions, identify an installation user, and understand the directory structure for installation and configuration, see *Planning an Installation of Oracle Fusion Middleware*. Refer to the component-specific installation guides for the component(s) you are installing.

2.4.7 Upgrade the Target 64-bit Environment Using the Standard Upgrade Procedure

After installing the product on the target machine, you must upgrade each component individually using an upgrade utility specified in the component-specific upgrade guide and complete any post-upgrade tasks.

For a complete upgrade procedure, see the component-specific upgrade guide for the component(s) you are upgrading.

Note: The Node Manager upgrade procedure requires access to the original Node Manager files. Use the 11g Node Manger files that were backed up from the 32-bit source machine as part of [Back up all Files from the 32-bit Host Machine](#).

2.5 Purging Unused Data

Purging unused data before an upgrade can optimize the upgrade process. Automated purge scripts are available for some components and can run before an upgrade to purge unused and obsolete data.

For Oracle Data Integrator (ODI) Components

Purge the execution logs to avoid exporting and importing excessive data as part of work repository export/import in the next step. See [Purging the Logs](#)

For SOA Suite Components

If you are using purge scripts, wait until the purge is complete before starting the upgrade process. The upgrade may fail if the purge scripts are running while using the Upgrade Assistant to upgrade your schemas.

Note: If a large amount of data needs to be purged, consider partitioning tables or employing other data optimization strategies. Using scripts to remove large amounts of data may impact performance.

See [Developing a Purging and Partitioning Methodology](#) and [Developing a Database Growth Management Strategy](#)

2.6 Creating the Required Schemas Before Upgrade

Before you upgrade, you may be required to create new schemas for your 12c deployment. To determine which additional schemas need to be created for 12c, compare the component schemas you have in your existing environment to the schemas required for your upgrade.

Refer to the component-specific upgrade guides in order to identify the schemas that are required for your components. The Upgrade Assistant identifies all of the schemas that are available for an upgrade, and includes all the schemas in the upgrade. It also allows you to select the schemas that should be upgraded. For more information about , see [Identifying Schemas that Can be Upgraded with the Upgrade Assistant](#).

If you are upgrading from 11g, note the following:

- In 12c, there is a new schema that must be created before you can upgrade from 11g. The new **Service Table** schema (*prefix_STB*) stores basic schema configuration

information that can be accessed and used by other Oracle Fusion Middleware components during the domain creation. For more information, see Understanding the Service Table Schema.

Note: If you have not created the Service Table schema, you might encounter the error message UPGAST-00328 : The schema version registry table does not exist on this database. If that happens is it necessary to create the service table schema in order to run Upgrade Assistant.

- An OPSS schema is also required for 12c if your 11g environment is not already using an OPSS schema.
- The audit schema includes two additional schemas which also need to be created before running 12c. When upgrading audit services (`_IAU`), make sure that you select `_IAU_APPEND` and `_IAU_VIEWER` in addition to `_IAU`.

2.7 Reassociating File-based Policy Stores to Database-based Policy Stores (Required)

Oracle Fusion Middleware 12c uses database-based policy stores. A database-based policy store is recommended for a production environment. If you are using a file-based or OID-based policy store, you must reassociate the store to a database-based store prior to upgrade.

To reassociate file-based policy stores to database-based policy store, you must create an OPSS schema in the database and also create a data source in the WebLogic server.

If you are already using database-based policy store, then you do not have to perform these tasks.

Creating 11g OPSS and IAU Schemas

To use a database repository for the Oracle Platform Security Services (OPSS) security store, you must create the required schema and seed some initial data using the Oracle Fusion Middleware Repository Creation Utility (RCU). This setup is also required before reassociating the OPSS security store to a DB-based security store.

Reassociating the 11g Policy Store with the Database-Based Policy Store and OPSS Schema

The OPSS security store is the repository of system and application-specific policies, credentials, keys, and audit services. OPSS delegates the identity store service to the identity providers that are configured in the WebLogic server. Out-of-the-box, the OPSS security store is file-based. You must reassociate it to a database-based security store.

Validating that the Policy Store Reassociation is Successful

Reassociation modifies the domain configuration file: `DOMAIN_HOME/config/fmwconfig/jps-config.xml`. It deletes any configuration for the old store provider, inserts a configuration for the new store provider, and moves the policy and credential information from the source to the destination store.

Creating the 12c OPSS Schema for an OID-based Security Store

The only supported LDAP-based OPSS security store is **Oracle Internet Directory** (OID). An LDAP-based policy store is typically used in

production environments. If you are using an OID-based security store in 11g, you must create the new 12c schemas using the Repository Creation Utility (RCU).

2.7.1 Creating 11g OPSS and IAU Schemas

To use a database repository for the Oracle Platform Security Services (OPSS) security store, you must create the required schema and seed some initial data using the Oracle Fusion Middleware Repository Creation Utility (RCU). This setup is also required before reassociating the OPSS security store to a DB-based security store.

Create new 11g Oracle Platform Security Services (OPSS) and Audit Schemas (IAU) schemas in a supported Database using the 11g Repository Creation Utility.

For more information about creating 11g schemas, see [Obtaining and Running Repository Creation Utility](#) in the 11g version of the *Oracle Fusion Middleware Repository Creation Utility User's Guide*.

2.7.2 Reassociating the 11g Policy Store with the Database-Based Policy Store and OPSS Schema

The OPSS security store is the repository of system and application-specific policies, credentials, keys, and audit services. OPSS delegates the identity store service to the identity providers that are configured in the WebLogic server. Out-of-the-box, the OPSS security store is file-based. You must reassociate it to a database-based security store.

For complete information about reassociating the 11g OPSS schema with database-based repository, see [Reassociating the OPSS Security Store](#).

2.7.3 Validating that the Policy Store Reassociation is Successful

Reassociation modifies the domain configuration file: `DOMAIN_HOME/config/fmwconfig/jps-config.xml`. It deletes any configuration for the old store provider, inserts a configuration for the new store provider, and moves the policy and credential information from the source to the destination store.

Validating the Policy Store Reassociation using the Enterprise Manager Fusion Middleware Control

To verify that the policy store reassociation is successful:


1. Log in to Enterprise Manager Fusion Middleware Control.
2. Navigate to **Domain > Security > Security Provider Configuration**.
3. Click **Audit Service > Configure**.
4. Verify that the Provider Type is set to **Oracle Database**. If the Provider Type displays **File**, the reassociation is unsuccessful.

Security Provider Configuration

Use this page to configure WebLogic Domain policy and credential store providers, keystore and login modules used by Web Services Manager.

Security Stores

Current policy and credential store providers are shown below. To change the current policy and credential providers use the Change Association button.

Change Association  Edit		
Name	Provider Type	Location
Policy Store Credential Store Keystore	Oracle Database	./system-jazn-data.xml

Validating the Policy Store Reassociation by Viewing the jps-config.xml File

Alternatively, you can check the jps-config.xml file. The credstore.db, polycystore.db, and the keystore.db service instances refer to the database via the props.db.1 property.

After the reassociation, the jps-config.xml file must display:

```
<jpsContext name="default"
<serviceInstanceRef ref="credstore.db"/>
<serviceInstanceRef ref="keystore.db"/>
<serviceInstanceRef ref="polycystore.db"/>
<serviceInstanceRef ref="audit"/>
<serviceInstanceRef ref="idstore.ldap"/>
<serviceInstanceRef ref="trust"/>
<serviceInstanceRef ref="pdp.service"/>
</jpsContext>

<serviceInstance provider="polycystore.provider" name="polycystore.db"
  <property value="DB_ORACLE" name="polycystore.type"/>
  <propertySetRef ref="props.db.1"/>
</serviceInstance>

<propertySet name="props.db.1">
  <property value="cn=soa_domain" name="oracle.security.jps.farm.name"/>
  <property value="cn=jpsroot" name="oracle.security.jps.ldap.root.name"/>
  <property value="jdbc/opss" name="datasource.jndi.name"/>
</propertySet>
```

2.7.4 Creating the 12c OPSS Schema for an OID-based Security Store

The only supported LDAP-based OPSS security store is **Oracle Internet Directory** (OID). An LDAP-based policy store is typically used in production environments. If you are using an OID-based security store in 11g, you must create the new 12c schemas using the Repository Creation Utility (RCU).

You do not need to reassociate an OID-based security store before upgrade. While the Upgrade Assistant is running, select the OPSS schema. The Upgrade Assistant upgrades the OID-based security store automatically.

Note:

The 12c OPSS database schema is required so that you can reference the 12c schema during the reconfiguration of the domain. Your domain continues to use the OID-based security store after the upgrade is complete.

2.8 Upgrading Security Stores to the Latest Version

Upgrading to the latest version of the OPSS security store enable you to use enhanced features and fixes. OPSS security store is a part of Oracle Fusion Middleware product installation and therefore, you can use the Upgrade Assistant directly to upgrade the OPSS schema.

Before upgrading the OPSS security store, it is important to create a back up so that it can be recovered in case the upgrade fails. For details about backing up the security store, see [Backing Up and Recovering the OPSS Security Store](#).

schema_name

To check the version of the OPSS schema present on your system, run the following query on the database:

```
SELECT VERSION, STATUS, UPGRADED
FROM SCHEMA_VERSION_REGISTRY
WHERE OWNER='schema_name' ;
```

where, *schema_name* is the name of the OPSS schema. For example, DEV_OPSS.

To upgrade an OPSS schema using the Upgrade Assistant:

1. Start Upgrade Assistant by entering the following command:

```
cd oracle_common/upgrade/bin
./ua
```

2. On the left pane, select **Schemas** and click **Next**.
3. On the Schemas page, choose **Schemas** and click **Next**.
4. On the Available Components page, check **Oracle Platform Security Services** and click **Next**.
5. On the **Prerequisites** page, verify that all the listed prerequisites are met. Then check all boxes, and click **Next**.
6. Enter the correct IAU and OPSS schema details carefully.
7. On the left pane, click **Upgrade Summary**. The Upgrade Summary page displays the schemas to be upgraded.
8. Click **Upgrade**. The Upgrade Progress page displays the upgrading progress and the final status.

After the upgrade is complete, click **Finish** to dismiss the installer.

If you have already created a domain, then you can follow the procedure available in the topic: [Upgrading Schemas with Upgrade Assistant](#).

2.9 Creating a Non-SYSDBA User

Oracle recommends that you create a non-SYSDBA user to run the Upgrade Assistant. The user created using this procedure has the privileges required to complete the upgrade.

SYSDBA is an administrative privilege, required to perform high-level administrative operations such as creating, starting up, shutting down, backing up, or recovering the database. The SYSDBA system privilege is for a fully empowered database administrator. When you connect with the SYSDBA privilege, you connect with a default schema and not with the schema that is generally associated with your user name. For SYSDBA, this schema is SYS. Access to a default schema can be a very powerful privilege. For example, when you connect as user SYS, you have unlimited privileges on data dictionary tables. Therefore, Oracle recommends that you create a Non-SYSDBA user to upgrade the schemas. The privileges listed in this topic must be granted before starting the Upgrade Assistant.

Note: The v\$atrans table does not exist by default. You must run the XAVIEW.SQL script to create this table before creating the user. Moreover, grant on v\$atrans table is required only for Oracle Identity Manager. If you do not require Oracle Identity Manager for configuration or if you do not have the v\$atrans table, then remove the following line from the script:

```
grant select on v$atrans to FMW with grant option;
```

Note: If you are upgrading an ORASDPM schema that was created using RCU 11g (11.1.1.1.4 or earlier), and you subsequently upgraded ORASDPM to 11g (11.1.1.6 or later), the FMW user will need to grant the CREATE TABLE privilege to user <prefix>_ORASDPM before upgrading to 12c (12.2.1).

```
grant CREATE TABLE to <prefix>_ORASDPM;
```

Where <prefix> is the name given to the schema when it was created.

In the example below, welcome1 is the password. Make sure that you specify your actual password when granting privileges.

```
create user FMW identified by welcome1;
grant dba to FMW;
grant execute on DBMS_LOB to FMW with grant option;
grant execute on DBMS_OUTPUT to FMW with grant option;
grant execute on DBMS_STATS to FMW with grant option;
grant execute on sys.dbms_aqadm to FMW with grant option;
grant execute on sys.dbms_aqin to FMW with grant option;
grant execute on sys.dbms_aqjms to FMW with grant option;
grant execute on sys.dbms_aq to FMW with grant option;
grant execute on utl_file to FMW with grant option;
grant execute on dbms_lock to FMW with grant option;
grant select on sys.V_$INSTANCE to FMW with grant option;
grant select on sys.GV_$INSTANCE to FMW with grant option;
grant select on sys.V_$SESSION to FMW with grant option;
grant select on sys.GV_$SESSION to FMW with grant option;
grant select on dba_scheduler_jobs to FMW with grant option;
grant select on dba_scheduler_job_run_details to FMW with grant option;
```

```

grant select on dba_scheduler_running_jobs to FMW with grant option;
grant select on dba_aq_agents to FMW with grant option;
grant execute on sys.DBMS_SHARED_POOL to FMW with grant option;
grant select on dba_2pc_pending to FMW with grant option;
grant select on dba_pending_transactions to FMW with grant option;
grant execute on DBMS_FLASHBACK to FMW with grant option;
grant execute on dbms_crypto to FMW with grant option;
grant execute on DBMS_REPUTIL to FMW with grant option;
grant execute on dbms_job to FMW with grant option;
grant select on pending_trans$ to FMW with grant option;
grant select on dba_scheduler_job_classes to fmw with grant option;
grant select on SYS.DBA_DATA_FILES to FMW with grant option;
grant select on SYS.V_$ASM_DISKGROUP to FMW with grant option;
grant select on v$xsatrans$ to FMW with grant option;
grant execute on sys.dbms_system to FMW with grant option;
grant execute on DBMS_SCHEDULER to FMW with grant option;
grant select on dba_data_files to FMW with grant option;
grant execute on UTL_RAW to FMW with grant option;
grant execute on DBMS_XMLDOM to FMW with grant option;
grant execute on DBMS_APPLICATION_INFO to FMW with grant option;
grant execute on DBMS_UTILITY to FMW with grant option;
grant execute on DBMS_SESSION to FMW with grant option;
grant execute on DBMS_METADATA to FMW with grant option;
grant execute on DBMS_XMLGEN to FMW with grant option;
grant execute on DBMS_DATAPUMP to FMW with grant option;
grant execute on DBMS_MVIEW to FMW with grant option;
grant select on ALL_ENCRYPTED_COLUMNS to FMW with grant option;
grant select on dba_queue_subscribers to FMW with grant option;
grant execute on SYS.DBMS_ASSERT to FMW with grant option;

```

Note:

Oracle Database 11.2.0.3 Database Users ONLY: You must apply **Oracle Patch 13036331** before you begin the upgrade. Go to My Oracle Support to download the patch.

If you do not apply this patch, then you will have to grant additional privileges for some schemas.

2.10 Using Enhanced Encryption (AES 256)

The Java platform defines a set of APIs spanning major security areas, including cryptography, public key infrastructure, authentication, secure communication, and access control. These APIs allow developers to easily integrate security mechanisms into their application code. If you plan to use enhanced encryption (such as AES 256), Oracle recommends that you apply these policy files to the JDK before you upgrade.

Some of the security algorithms used in Fusion Middleware 12c require additional policy files for the JDK. For more information, see [Java Cryptography Architecture Oracle Providers Documentation](#).

If you do not apply these policy files to the JDK before you begin the upgrade, the upgrade can fail and you need to restore the entire pre-upgrade environment and start the upgrade from the beginning.

2.11 Creating an Edition on the Server for Edition-Based Redefinition (Optional)

Edition-based redefinition enables you to upgrade an Oracle Database component of an application, such as PL/SQL objects, views, and synonyms, while it is in use, thereby minimizing or eliminating down time.

Note: This task must be carried out only by the Oracle Database User, having DBA privileges.

Before upgrading an Edition-Based Redefinition (EBR) enabled schema, you must connect to the database server and create an edition on the database server for 12c. The new edition for 12c must be a child of your existing 11g or 12c edition.

To create an edition on the database server, log in as an SYS user (or another Oracle user that has DBA privileges) and enter the following command:

```
create edition Oracle_FMW_12_2_1 as child of
Oracle_FMW_11_1_1_7_0;
```

Where, `Oracle_FMW_11_1_1_7_0` is an example of the edition name you specified in RCU 11.1.1.7 when the 11.1.1.7 schemas were created. Be sure to provide the actual name used when creating the edition.

If the edition is created successfully, you get the following message:

```
Edition created.
```

During the upgrade, you are prompted to launch the Reconfiguration Wizard to reconfigure your existing domain. Before running the Reconfiguration Wizard, you must specify the database default edition. Use the following SQL to manually setup the default edition name for the database, for example:

```
ALTER DATABASE DEFAULT EDITION = Oracle_FMW_12_2_1;
```

2.12 Maintaining Custom Domain Environment Settings

Every domain includes dynamically generated domain and server startup scripts, such as `setDomainEnv`. Oracle recommends that you do not modify these startup scripts, as any changes made to them are overwritten during subsequent domain upgrade and reconfiguration operations.

To maintain your custom domain-level environment settings, creating a separate file to store the custom domain information before you upgrade.

For example, if you want to customize server startup parameters that apply to all servers in a domain, you can create a file called `setUserOverrides.cmd` (Windows) or `setUserOverrides.sh` (UNIX) and configure it to add custom libraries to the WebLogic Server classpath, specify additional java command line options for running the servers, or specify additional environment variables, for instance. Any custom settings you add to this file are preserved during domain upgrade operation and are carried over to the remote servers when using the `pack` and `unpack` commands.

Following is an example of startup customizations in a `setUserOverrides` file:

```
# add custom libraries to the WebLogic Server system claspath
if [ "${POST_CLASSPATH}" != "" ] ; then
    POST_CLASSPATH="${POST_CLASSPATH}${CLASSPATHSEP}${HOME}/foo/fooBar.jar"
export POST_CLASSPATH
```



```

else
  POST_CLASSPATH="${HOME}/foo/fooBar.jar"
  export POST_CLASSPATH
fi

# specify additional java command line options for servers
JAVA_OPTIONS="${JAVA_OPTIONS} -Dcustom.property.key=custom.value"

```

If the `setUserOverrides` file exists during a server startup, the file is included in the startup sequence and any overrides contained within this file take effect. You must store the `setUserOverrides` file in the `domain_home/bin` directory.

Note:

If you are unable to create the `setUserOverrides` script before an upgrade, you need to reapply your settings as described in [Re-apply Customizations to Startup Scripts](#).

2.13 Downloading and Installing the 12c Oracle Fusion Middleware Product Distributions

Oracle Fusion Middleware product distributions are available for download on Oracle Technology Network (OTN) and Oracle Software Delivery Cloud.

For more information on which site you should visit to obtain your distribution, see the [Oracle Fusion Middleware Download, Installation, and Configuration Readme Files](#) page.

After you have downloaded all the necessary software, you can proceed to install and configure your software.

To get started with your installations, refer to the [Install, Patch, and Upgrade common tasks](#) page in the Oracle Fusion Middleware 12c (12.2.1) Documentation Library on OTN.

Note: You must install the Fusion Middleware Infrastructure distribution before installing the component-specific distributions.

2.14 Using the Upgrade Assistant to Run a Pre-Upgrade Readiness Check

The Upgrade Assistant can be run in the `-readiness` mode to perform a read-only, pre-upgrade check on your domain. If issues are detected, you can correct them before starting the actual upgrade.

You can run the readiness check while the system is online. Depending on the comprehensiveness of the checks, the readiness checks can take more time to complete. Consider running the check during off-peak hours.

To perform a readiness check on your pre-upgrade environment, launch the Upgrade Assistant in `-readiness` mode:

1. Change directory to `ORACLE_HOME/oracle_common/upgrade/bin.` on UNIX operating systems or `ORACLE_HOME\oracle_common\upgrade\bin` on Windows operating systems.
2. To start the Upgrade Assistant on UNIX operating systems:

```
./ua -readiness
```

3. To start the Upgrade Assistant on Windows operating systems:

```
ua.bat -readiness
```

4. Provide the required information in each of the Upgrade Assistant screens.

The screens you see will vary depending on the upgrade options you select. The sections below describe the upgrade options and the information you will need to provide.

2.15 Locating the Component-Specific Upgrade Documentation

The component specific upgrade documentation provides upgrade procedure and information for every individual component including Oracle WebLogic Server, Oracle Fusion Middleware Infrastructure, Oracle HTTP Server, Oracle SOA Suite and Oracle Business Process Management, Oracle Webcenter, User Messaging Service, and Oracle Data Integrator.

The following table helps you determine which upgrade-specific tasks you will need to complete for your 12c upgrade:

Table 2-2 Component-Specific Upgrade Documentation

Product Area	If you are upgrading...	Use this upgrade document...
Oracle WebLogic Server - Standalone	An Oracle WebLogic Server that is not being managed by or registered to an existing Fusion Middleware 11g domain.	<i>Upgrading Oracle WebLogic Server</i>
Custom Oracle Application Developer Framework Applications with Oracle WebLogic Server (referred to as Infrastructure in 12c)	A managed 11g WebLogic Server domain that has been deployed with a set of custom Oracle Application Developer Framework applications.	<i>Upgrading to the Oracle Fusion Middleware Infrastructure</i>
Oracle HTTP Server - Managed or Standalone	An Oracle HTTP Server that is configured to work with a WebLogic domain for management functions is a managed server. An Oracle HTTP Server that is not managed by or registered to an Oracle WebLogic domain is a standalone server.	<i>Upgrading Oracle HTTP Server</i>
Oracle SOA Suite and BPM	SOA Suite components including: Business Process Management (BPM), Oracle Service Bus (OSB), Enterprise Security Services (ESS), Managed File Transfer (MFT), Business Activity Monitoring (BAM), and workflow instance data.	<i>Upgrading Oracle SOA Suite and Business Process Management</i>

Table 2-2 (Cont.) Component-Specific Upgrade Documentation

Product Area	If you are upgrading...	Use this upgrade document...
User Messaging Service	User Messaging Service.	<i>Administering Oracle User Messaging Service</i>
Oracle Data Integrator	Data Integrator.	<i>Upgrading Oracle Data Integrator</i>
Oracle WebCenter	WebCenter suite components including Content, Portal and Sites.	<i>Upgrading Oracle WebCenter</i>
Oracle Business Intelligence	Oracle Business Intelligence including BI Enterprise Edition, BI Publisher, and Essbase.	<i>Upgrading Oracle Business Intelligence</i>
Oracle Forms	Oracle Forms.	<i>Upgrading Oracle Forms</i>

Pre-Upgrade Tasks for SOA Suite and Business Process Management

Describes the required pre-upgrade tasks for Oracle SOA Suite components. These pre-upgrade tasks must be completed in addition to the standard Oracle Fusion Middleware pre-upgrade tasks described in the pre-upgrade checklist. .

Note:

Depending on which Oracle SOA 11g products are being upgraded, you may need to perform additional pre-upgrade tasks.

The tasks describe the general pre-upgrade tasks required when upgrading to SOA Suite and BPM 12c (12.2.1). Review the product-specific upgrade chapters for each product that is being upgraded to determine if additional tasks are required for your upgrade.

[Performing SOA-Specific Pre-Upgrade Tasks](#)

In addition to the Oracle Fusion Middleware pre-upgrade requirements, you may also be required to complete additional SOA-specific upgrade tasks depending on your pre-upgrade environment.

[Installing the 12c \(12.2.1\) Infrastructure Distributions Before Upgrade](#)

Install all of the required 12c distributions in a new Oracle home before upgrading to Oracle SOA Suite and Business Process Management 12c.

[Installing SOA Integrated Distributions](#)

You must install the 12c product distributions for each SOA integrated component you will be upgrading.

[Preparing to Upgrade SOA Schemas](#)

It is important that you understand how to prepare your schemas for an upgrade before you start the upgrade process.

3.1 Performing SOA-Specific Pre-Upgrade Tasks

In addition to the Oracle Fusion Middleware pre-upgrade requirements, you may also be required to complete additional SOA-specific upgrade tasks depending on your pre-upgrade environment.

This section includes pre-upgrade tasks that apply to any SOA, Business Process Management, or integrated products being upgraded to 12c (12.2.1). Perform only those tasks that apply to your environment.

Caution:

Failure to properly prepare for an upgrade may lead to unrecoverable errors and upgrade failures. Make sure that you have completed ALL applicable pre-upgrade tasks before beginning the upgrade.

The general pre-upgrade tasks include the following:

Pre-Upgrade Task	More Information
<p>Complete all general pre-upgrade tasks described in the Oracle Fusion Middleware 12c Upgrade Checklist (Required)</p> <p>CAUTION: DO NOT continue with the upgrade until this task has been completed.</p>	<p>Oracle Fusion Middleware 12c Pre-Upgrade Checklist</p>
<p>Run 11g Purge scripts before starting the upgrade to reduce downtime during the upgrade.</p>	<p>Purging Unused Data</p>
<p>Understand the Oracle Database requirements for upgrading to Oracle SOA Suite and BPM 12.2.1</p>	<p>Upgrading and Preparing the Fusion Middleware Database for a SOA Suite Upgrade</p>
<p>Verify that your tablespaces are sized appropriately (insufficient sizing will result in a failed upgrade).</p>	<p>Adding Datafiles to the SOAINFRA and IAS_TEMP Tablespaces</p>
<p>SOA Composer Users Only: Note that uncommitted changes are not available after upgrade.</p>	<p>Committing SOA Composer Changes Before Upgrade</p>
<p>Complete the required pre-upgrade tasks for User Messaging Service (UMS) if you are upgrading UMS as part of your SOA Suite upgrade.</p>	<p>Performing pre-Upgrade Tasks for User Messaging Service (UMS)</p>
<p>Complete the required pre-upgrade tasks for Oracle Service Bus (OSB) if you are upgrading OSB as part of your SOA Suite upgrade.</p>	<p>Pre-Upgrade Tasks for Oracle Service Bus (OSB)</p>
<p>Upgrade your standalone Oracle HTTP Server (if necessary).</p>	<p>Upgrading a Standalone Oracle HTTP Server</p>
<p>Install Oracle SOA Suite or Oracle Business Process Management Quick Start for Developers if you are upgrading custom applications</p>	<p>Upgrading Custom Applications Using Oracle JDeveloper 12c</p>
<p>Stop all 11g FMW servers and processes before you launch the Upgrade Assistant.</p>	<p>Stopping SOA Servers and Processes</p> <p>NOTE: All middle tier servers, such as soa_server1, MUST be stopped before starting the Upgrade Assistant.</p>

Purging Unused Data

Purging unused data before an upgrade can optimize the upgrade process.

Upgrading and Preparing the Fusion Middleware Database for a SOA Suite Upgrade

You must have a supported database configured with the required schemas before you can run Fusion Middleware 12c (12.2.1).

Adding Datafiles to the SOAINFRA and IAS_TEMP Tablespaces

Oracle recommends that you add more data files to the existing SOA database tablespace to prevent a failed upgrade.

Performing pre-Upgrade Tasks for User Messaging Service (UMS)

Complete the required pre-upgrade tasks for User Messaging Service (UMS) if you are upgrading UMS as part of your SOA Suite upgrade.

Pre-Upgrade Tasks for Oracle Service Bus (OSB)

You must complete the required pre-upgrade tasks for Oracle Service Bus (OSB) if you are upgrading OSB as part of your SOA Suite upgrade.

Upgrading a Standalone Oracle HTTP Server

If you are upgrading a standalone Oracle HTTP Server, then you should follow the instructions in *Upgrading Oracle HTTP Server*.

Upgrading Custom Applications Using Oracle JDeveloper 12c

If you have deployed custom applications to a SOA 11g domain, then the application deployments should function as they did in Oracle Fusion Middleware 11g after the upgrade procedure is complete.

Stopping SOA Servers and Processes

Before running Upgrade Assistant, you must shut down ALL Oracle Fusion Middleware Managed Servers, Administration Servers, and system components (such as OHS) that may be using the schemas or configurations you want to update.

Committing SOA Composer Changes Before Upgrade

If you do not commit or rollback your changes to the SOA Composer sandbox before you upgrade, your changes may not be propagated to the new environment.

3.1.1 Purging Unused Data

Purging unused data before an upgrade can optimize the upgrade process.

Purging unused data before an upgrade can optimize the upgrade process by reducing the number of instances, fault alerts, or adapter reports that will be upgraded to the new 12c deployment. Purging your closed instances can greatly improve the duration of the upgrade. Note, however, that if you purge your closed instances, you will not be able to view or report on them using Enterprise Manager 12c.

Caution:

Do not start the Upgrade Assistant while the purge scripts are running. Wait until the purge is complete before starting the upgrade process. The upgrade will fail if the purge scripts are running while using the Upgrade Assistant to upgrade your schemas. For more information on using purge scripts with the Upgrade Assistant, see [Using Purge Scripts Before You Upgrade](#).

For more information on using Auto Purge or purge scripts, see *Managing Database Growth*.

Note:

If a large amount of data needs to be purged, consider partitioning tables or employing other data optimization strategies. Using the scripts to remove large amounts of data may impact performance.

For more information, see *Developing a Purging and Partitioning Methodology* and *Developing a Database Growth Management Strategy*.

3.1.2 Upgrading and Preparing the Fusion Middleware Database for a SOA Suite Upgrade

You must have a supported database configured with the required schemas before you can run Fusion Middleware 12c (12.2.1).

It is imperative that you understand the Oracle Database requirements for upgrading to Oracle SOA Suite and BPM 12.2.1, and ensure that the database hosting Oracle Fusion Middleware is supported and has sufficient space to perform an upgrade. You must have a supported database configured with the required schemas before you can run Fusion Middleware 12c (12.2.1). Always refer to the latest database certification matrix for the most current information.

Verifying database requirements is part of the pre-upgrade checklist for Oracle Fusion Middleware 12c. If you have not reviewed these requirements, see "Upgrading and Preparing Your Oracle Databases for 12c (12.2.1)" in *Planning an Upgrade of Oracle Fusion Middleware*.

Note:

In 11g it was possible to run Oracle Service Bus without a database, as the SOA schema was not required. In 12c, however, you must have a supported database configured with the required SOA schemas before you can run OSB 12c (12.2.1).

For more information, see [Preparing to Upgrade SOA Schemas](#).

3.1.3 Adding Datafiles to the SOAINFRA and IAS_TEMP Tablespaces

Oracle recommends that you add more data files to the existing SOA database tablespace to prevent a failed upgrade.

While important for all tablespaces, it is especially important to make sure that the 11g SOAINFRA tablespace and IAS_TEMP tablespace are sized for a successful upgrade.

Note:

Once a database schema upgrade has failed due to a sizing error, you cannot simply add more disk space and retry the upgrade. The schemas have been left in an inconsistent state and may have been marked "INVALID". You cannot recover from this error without restoring the original, pre-upgrade environment from backups.

Two sample commands are provided below. Size the files according to your own use case scenarios.

To add datafiles to SOAINFRA tablespace:

Connect to the database as sysdba and run the following command:

```
alter tablespace <PREFIX>_SOAINFRA add datafile '<DB_HOME>/oradata/orcl/  
<New_SoaInfra_DBF_FileName>' size 1000M autoextend on next 30M maxsize unlimited;  
commit;
```

To add tempfiles to IAS_TEMP tablespace:

Connect to the database as sysdba and run the following command:

```
alter tablespace PREFIX_IAS_TEMP add tempfile '<DB_HOME>/oradata/orcl/  
<New_iastemp_dbf_filename>' size 1000M autoextend on next 30M maxsize unlimited;  
commit;
```

For more information on sizing your tablespaces before upgrade, see [Creating Datafiles and Adding Datafiles to a Tablespace](#).

3.1.4 Performing pre-Upgrade Tasks for User Messaging Service (UMS)

Complete the required pre-upgrade tasks for User Messaging Service (UMS) if you are upgrading UMS as part of your SOA Suite upgrade.

If you are upgrading User Messaging Service from 11g to 12c, you may need to perform additional pre-upgrade tasks such as manually copying the configuration files from the managed server to the Admin server. If you are upgrading UMS from a previous 12c release, then you will not have to perform this task again.

For more information, see [Upgrading User Messaging Service](#).

3.1.5 Pre-Upgrade Tasks for Oracle Service Bus (OSB)

You must complete the required pre-upgrade tasks for Oracle Service Bus (OSB) if you are upgrading OSB as part of your SOA Suite upgrade.

If you are upgrading a SOA domain with Oracle Service Bus, you must perform several required pre-upgrade tasks. See [Performing Pre-Upgrade Tasks for Oracle Service Bus \(OSB\)](#).

3.1.6 Upgrading a Standalone Oracle HTTP Server

If you are upgrading a standalone Oracle HTTP Server, then you should follow the instructions in *Upgrading Oracle HTTP Server*.

This guide explains how to upgrade Oracle HTTP Server 11g instances that have been configured so they are "associated with" an Oracle WebLogic Server domain. The

HTTP server upgrade is performed automatically when upgrading the domain to which the Oracle HTTP Server has been associated.

To upgrade a standalone Oracle HTTP Server instance (one that is *not* associated with an 11g domain) or to upgrade the HTTP server at another time, refer to *Upgrading Oracle HTTP Server*.

3.1.7 Upgrading Custom Applications Using Oracle JDeveloper 12c

If you have deployed custom applications to a SOA 11g domain, then the application deployments should function as they did in Oracle Fusion Middleware 11g after the upgrade procedure is complete.

If you want to take advantage of new Oracle 12c features, download and install the Oracle SOA Suite or Oracle Business Process Management Quick Start for Developers.

The Quick Start for Developers distributions provide Oracle JDeveloper 12c users with the required extensions for developing Oracle SOA Suite and Oracle Business Process Management applications.

For more information, see *Installing Oracle SOA Suite Quick Start for Developers*.

Note: Oracle QuickStart is required if you want to use new Oracle SOA 12c features.

3.1.8 Stopping SOA Servers and Processes

Before running Upgrade Assistant, you must shut down ALL Oracle Fusion Middleware Managed Servers, Administration Servers, and system components (such as OHS) that may be using the schemas or configurations you want to update.

Failure to shut down servers and processes may result in an incomplete or failed upgrade.

If you are running Node Manager, you should also stop the Node Manager. You can do this by closing the console window in which Node Manager is running, or by using the `stopNodeManager WLST` command.

Stop SOA servers and processes in this order:

1. Business Activity Monitoring (BAM) Managed Server
2. Oracle Service Bus (OSB) Managed Server
3. Service-Oriented Architecture (SOA) Managed Server
4. Oracle Web Services Manager (OWSM) Managed Server
5. Administration Servers
6. Node Managers
7. Webtier (including the Oracle HTTP Server)

Instructions for stopping an Oracle Fusion Middleware environment are provided in *Stopping an Oracle Fusion Middleware Environment*.

3.1.9 Committing SOA Composer Changes Before Upgrade

If you do not commit or rollback your changes to the SOA Composer sandbox before you upgrade, your changes may not be propagated to the new environment.

Before you start the upgrade, make sure that you have committed or rolled back any changes that you do or do not want propagated to the upgraded environment.

3.2 Installing the 12c (12.2.1) Infrastructure Distributions Before Upgrade

Install all of the required 12c distributions in a new Oracle home before upgrading to Oracle SOA Suite and Business Process Management 12c.

Oracle SOA Suite and Business Process Management and the integrated SOA components require the Fusion Middleware Infrastructure and Oracle HTTP Server (if applicable). These distributions must be installed before you install and configure Oracle SOA Suite and BPM 12c (12.2.1).

For more information, see *Installing Oracle Fusion Middleware Infrastructure*.

[Installing WebLogic Server and JRF Infrastructure](#)

[Installing Oracle HTTP Server](#)

3.2.1 Installing WebLogic Server and JRF Infrastructure

Before you can upgrade your existing SOA 11g components, you must first install an Oracle WebLogic Server and JRF using the 12c (12.2.1) Infrastructure distribution.

See *Installing and Configuring the Oracle Fusion Middleware Infrastructure* for detailed instructions.

Caution:

When installing the Infrastructure distributions, do not use the Configuration Wizard to configure the domain. You will use the new Reconfiguration Wizard to configure the 11g domain during the upgrade process.

Note:

You must have the 12c (12.2.1) Infrastructure distribution installed before you can upgrade to SOA 12c (12.2.1). The only application server that Oracle Fusion Middleware 12c (12.2.1) supports is the Oracle WebLogic Server.

If you previously installed and configured the Infrastructure components using the 12c (12.1.2) release, you must first upgrade to Infrastructure 12c (12.2.1).

For more information, see *Upgrading from a Previous Infrastructure 12c Release*.

3.2.2 Installing Oracle HTTP Server

If your 11g domain includes Oracle HTTP Server instances that are associated with the domain, you must install Oracle HTTP Server 12.2.1 on the following machines:

- On machines where 11g Oracle HTTP Server instances are running
- On the machine where Administration Server is running

For more information about installing Oracle HTTP Server 12.2.1, see [Installing the Oracle HTTP Server Software](#).

3.3 Installing SOA Integrated Distributions

You must install the 12c product distributions for each SOA integrated component you will be upgrading.

Before you upgrade SOA to this release, you must first install all of the integrated component distributions for the components you will be upgrading. Install only those distributions that will be used in your upgraded environment.

Refer to the product-specific installation guides for more information:

- *Installing and Configuring Oracle SOA Suite and Business Process Management*
- *Installing and Configuring Oracle Service Bus*
- *Administering Oracle User Messaging Service*
- *Installing and Configuring Managed File Transfer*
- *Installing Oracle Event Processing*
- *Installing and Configuring B2B and Healthcare*

Caution:

When installing the SOA 12c distributions, do not use the Configuration Wizard to configure the domain. You will use the new Reconfiguration Wizard to configure the existing 11g or 12c domain during the upgrade process.

3.4 Preparing to Upgrade SOA Schemas

It is important that you understand how to prepare your schemas for an upgrade before you start the upgrade process.

You must determine which of the schemas will be upgraded and which schemas you will need to create prior to upgrade. .

Note:

As part of the schema upgrade, all active and closed instances will be automatically upgraded. You will not lose your active or "in flight" 11g work flow instances during the upgrade.

If you do not want to upgrade instances, you must prevent the instance upgrade before you start the Upgrade Assistant.

For more information, See [Administering and Monitoring the Upgrade of SOA Instances](#) .

Identifying Existing SOA Suite and Business Process Management 11g Schemas

Before you upgrade, review the Oracle Fusion Middleware 11g schemas that are already installed in your database.

Creating the Required SOA Schemas Before You Upgrade from 11g

You may need to create the new 12c required schemas in a supported database before you can upgrade.

3.4.1 Identifying Existing SOA Suite and Business Process Management 11g Schemas

Before you upgrade, review the Oracle Fusion Middleware 11g schemas that are already installed in your database.

If you used the Repository Creation Utility (RCU) to create your 11g schemas, then you can connect to the database as SYSTEM, or as any other database user with DBA privileges, and use the following SQL command to see a list of the Oracle Fusion Middleware 11g schemas that are already installed in your database:

```
SET LINE 120
COLUMN MRC_NAME FORMAT A14
COLUMN COMP_ID FORMAT A20
COLUMN VERSION FORMAT A12
COLUMN STATUS FORMAT A9
COLUMN UPGRADED FORMAT A8
SELECT MRC_NAME, COMP_ID, OWNER, VERSION, STATUS, UPGRADED FROM
SCHEMA_VERSION_REGISTRY ORDER BY MRC_NAME, COMP_ID ;
```

The schemas that can be upgraded to 12.2.1 must be at versions 11.1.1.6.x or higher. You can use this list to review your domain schemas and to help you determine which schemas to create and which schemas you need to upgrade.

For a complete list of schemas that are available for upgrade to Oracle Fusion Middleware 12c (12.2.1), see [Identifying Schemas that Can be Upgraded with the Upgrade Assistant](#).

3.4.2 Creating the Required SOA Schemas Before You Upgrade from 11g

You may need to create the new 12c required schemas in a supported database before you can upgrade.

After installing your 12.2.1 components, you will need to create the new 12c required schemas in a supported database certified for use with this release of Oracle Fusion Middleware. [Table 3-1](#) describes which schemas should be created based on the upgrade:

Note: If you are upgrading from a previous 12c release, you do not have to create new schemas before upgrading. For information on upgrading from a previous 12c release, see [Upgrading Oracle SOA Suite and Business Process Management from a Previous 12c Release](#)

Table 3-1 Required Schemas for SOA and SOA integrated products

Table 3-1 (Cont.) Required Schemas for SOA and SOA integrated products

If you are upgrading...	Create these 12c schemas before you upgrade...
SOA Suite (SOA)	Service Table (_STB) Audit Services (_IAU) NOTE: If you created a 12.1.2 version of the _STB schema, you will have to upgrade it to 12.2.1.
Business Process Monitoring (BPM)	Schemas required for SOA Suite
Business Activity Monitoring (BAM)	Schemas required for SOA Suite And: WebLogic Services (_WLS)
Managed File Transfer (MFT)	Schemas required for SOA Suite
Oracle Service Bus (OSB)	SOA Infrastructure (_SOAINFRA) Service Table (_STB) User Messaging (_UMS) NOTE: It is possible to install Oracle Service Bus without running Oracle SOA, but you must create the _SOAINFRA and _STB schemas. For more information, see Upgrading an OSB Domain (Without SOA)
User Messaging Service (UMS)	Schemas required for SOA Suite See <i>Administering Oracle User Messaging Service</i>

For more information, see the following sections of the *Upgrading to the Oracle Fusion Middleware Infrastructure*:

- Determining Which Schemas to Create
- Creating the Required Schemas with the Repository Creation Utility

Note:

Oracle Fusion Middleware only supports schemas in a byte-mode database. The `nls_length_semantics` initialization parameter, on the database where the schemas reside, must be set to `BYTE`; setting this parameter to `CHAR` is not supported.

To check the values of this parameter using SQL*Plus, you can use the `show parameters` command:

```
prompt> sqlplus "sys/<password> as sysdba"SQL> show parameters
nls_length_semantics
```

Replace `<password>` with the actual password for the SYS user.

Alternatively, you can check the values by querying the `V$PARAMETER` view:

```
prompt> sqlplus "sys/password as sysdba"SQL> select name,value from v
$parameter;
```

For more information, refer to your database administration documentation.

Upgrading to SOA Suite and Business Process Management 12c (12.2.1)

This section provides the end-to-end procedure for upgrading a single-node, SOA Suite with Business Process Management 11g production installation to SOA Suite with Business Process Management 12c (12.2.1).

Note:

Oracle strongly recommends that you create a copy of your actual production environment, upgrade the cloned environment, verify that the upgraded components work as expected, and then (and only then) upgrade your production environment.

Identifying potential upgrade issues in a cloned environment can eliminate unnecessary downtime of your production environment.

Complete this - and all other required pre-upgrade steps - before you start the upgrade. For more information see Oracle Fusion Middleware 12c Pre-Upgrade Checklist and [Performing SOA-Specific Pre-Upgrade Tasks](#).

[Installing Oracle SOA Suite and Business Process Management 12c](#)

[Generating Log Files During SOAINFRA Schema Upgrade \(Recommended\)](#)

[Upgrading Schemas with the Upgrade Assistant](#)

Follow these tasks to upgrade your schemas with the Upgrade Assistant.

[Reconfiguring the Domain Using the Reconfiguration Wizard](#)

The Reconfiguration Wizard is a new tool in 12c. It is run in conjunction with the Upgrade Assistant to upgrade your domain to 12c.

[Upgrading the Domain Component Configurations Using the Upgrade Assistant](#)

Use the Upgrade Assistant to update any remaining WebLogic component configurations within the domain.

[Upgrading Oracle Business Process Management \(BPM\) Web Forms](#)

[Managing Your Upgraded Oracle Fusion Middleware 12c Software](#)

4.1 Installing Oracle SOA Suite and Business Process Management 12c

Before you can upgrade your existing SOA and Business Process Management (BPM) 11g components, you must first install the SOA Suite and Business Process Management 12c (12.2.1) distributions. Follow the instructions described in *Installing and Configuring Oracle SOA Suite and Business Process Management*.

Note:

If your SOA domain has other SOA-integrated components, you must install those distributions as well. See the Oracle Fusion Middleware documentation library for a complete list of installation guides. Be sure to review any of the component-specific chapters in this book to determine if additional pre-upgrade steps for your additional installations.

During the installation process, you will be instructed to configure the newly installed domain. When upgrading, however, do not use the Configuration Wizard to configure the SOA 12.2.1 domain. The Configuration Wizard is used to configure a new domain installation. During an upgrade, however, you will be upgrading your existing domain using the Reconfiguration Wizard described later in this guide.

4.2 Generating Log Files During SOAINFRA Schema Upgrade (Recommended)

To facilitate troubleshooting the upgrade, Oracle recommends that you generate log files when upgrading `_SOAINFRA` schema. Logging is disabled by default.

To enable logging:

1. Create the soainfra user directory with the name `UPGRADE_DIR`
2. Enable debugging logs by calling function `set_LogLevel(1)` or `ALTER PROCEDURE log_debug COMPILER PLSQL_CCFLAGS = 'debug_on:TRUE';`

You can also launch the Upgrade Assistant with logging parameters as shown in the UNIX example below:

```
./ua [-logLevel <log_level>] [-logDir <log_directory>]
```

For more information on generating and using log files, see [Launching the Upgrade Assistant with Optional Arguments](#).

4.3 Upgrading Schemas with the Upgrade Assistant

Follow these tasks to upgrade your schemas with the Upgrade Assistant.

[About Upgrading Schemas using the Upgrade Assistant](#)

The Upgrade Assistant provides two options for upgrading schemas: **Individually Selected Schemas** and **All Schemas Used By a Domain**.

[Identifying Schemas that Can be Upgraded with the Upgrade Assistant](#)

The Upgrade Assistant identifies and includes all the schemas that are available for an upgrade. You can also select the schemas you want to upgrade. If you want to review the list of available schemas before you begin the upgrade, query the schema version registry.

[Starting the Upgrade Assistant](#)

The Upgrade Assistant is used to upgrade schemas, component configurations and standalone system components.

[Upgrading SOA Schemas with the Upgrade Assistant](#)

[Verifying the Schema Upgrade](#)

[Verifying the Instance Upgrade \(if applicable\)](#)

[Checking for Invalid Database Objects](#)

[Upgrading Partitioned Schema Tables from 11g](#)

If you are upgrading an Oracle SOA 11g installation that includes schemas partitioned as described in the *Oracle SOA Suite 11g Administration Guide*, and you want to continue with this specific table partitioning strategy in SOA 12c (12.2.1), then you must complete these required steps to upgrade your partitioned schema tables.

4.3.1 About Upgrading Schemas using the Upgrade Assistant

The Upgrade Assistant provides two options for upgrading schemas: **Individually Selected Schemas** and **All Schemas Used By a Domain**.

Individually Selected Schemas

This option enables you to choose which component schemas to upgrade. Select this option when you have component schemas within the domain that you do not want to upgrade.

For example, if you want to make a trial run of Upgrade Assistant by creating schemas with RCU that are outside the domain, and then use Upgrade Assistant to upgrade them.

All Schemas Used By a Domain

This option allows the Upgrade Assistant to detect all of the available schemas within the specified domain and include them in the upgrade.

4.3.2 Identifying Schemas that Can be Upgraded with the Upgrade Assistant

The Upgrade Assistant identifies and includes all the schemas that are available for an upgrade. You can also select the schemas you want to upgrade. If you want to review the list of available schemas before you begin the upgrade, query the schema version registry.

Tip:

Compare the information you collect from the schema version registry and the corresponding schemas to determine whether there are schemas in your domain that are not available for an upgrade yet.

If you are using an Oracle database, connect to the database as a user having Oracle DBA privileges, and run the following from SQL*Plus to get the current version numbers:

```
SET LINE 120
COLUMN MRC_NAME FORMAT A14
COLUMN COMP_ID FORMAT A20
COLUMN VERSION FORMAT A12
COLUMN STATUS FORMAT A9
COLUMN UPGRADED FORMAT A8
SELECT MRC_NAME, COMP_ID, OWNER, VERSION, STATUS, UPGRADED FROM
SCHEMA_VERSION_REGISTRY ORDER BY MRC_NAME, COMP_ID ;
```

The following report is generated when saved to a SQL script, for example `version.sql`.

If the number in the "VERSION" is at 11.1.1.6.0 or higher, and the STATUS column is 'VALID', then the schema is supported for upgrade.

If an upgrade is not needed for a schema, the `schema_version_registry` table retains the schemas at their pre-upgrade version after the 12.2.1 upgrade.

Notes about the schemas that need to be upgraded

- For **most** components, the only schema version starting points that are valid for upgrading are 11g Release 1 (11.1.1.6, 1.1.1.7, 11.1.1.8, or 11.1.1.9) or 12c (12.1.2 or 12.1.3). If your schemas are not at a supported version, then you must upgrade them before using the 12c (12.2.1) upgrade procedures.

Some components, such as Oracle Enterprise Data Quality and Oracle Golden Gate Veridata, support an upgrade from versions other than the standard Oracle Fusion Middleware supported versions.

Refer to your component-specific installation and upgrade documentation for additional information about the schemas that are required for your upgrade.

- If you used a file-based policy store in 11g, then you must reassociate the file-based policy store with a database-based security store before running the Upgrade Assistant.

For more information see [Reassociating a File-Based Policy Store Before Upgrade](#).

- If you used an OID-based policy store in 11g, make sure that you have created new 12c OPSS schemas before upgrade.
- If you are upgrading an ORASDPM schema that was created using RCU 11g (11.1.1.1.4 or earlier), and you subsequently upgraded ORASDPM to 11g (11.1.1.6 or later), the FMW user will need to grant the CREATE TABLE privilege to user `<prefix>_ORASDPM` before upgrading to 12c (12.2.1).

```
grant CREATE TABLE to &lt;prefix>_ORASDPM;
```

Where `<prefix>` is the name given to the schema when it was created.

- You can only upgrade schemas for products that are available for upgrade in the Oracle Fusion Middleware 12c (12.2.1) release. **Do not attempt to upgrade a domain that includes components that are not yet available for upgrade to 12c (12.2.1).**

4.3.3 Starting the Upgrade Assistant

The Upgrade Assistant is used to upgrade schemas, component configurations and standalone system components.

Oracle recommends that you successfully complete the upgrade of schemas and component configurations for a single domain before beginning the upgrade of another domain.

Note: The Upgrade Assistant should be run by a non-SYSDBA user whenever possible. The steps to create a non-SYSDBA user are described in [Creating a Non-SYSDBA User](#).

To start the Upgrade Assistant:

1. On the Unix operating system, change directory to `ORACLE_HOME/oracle_common/upgrade/bin`.

On the Windows operating system, change directory to `ORACLE_HOME\oracle_common\upgrade\bin`.

2. Enter the following command to start the Upgrade Assistant:

On UNIX operating systems:

```
./ua
```

On Windows operating systems:

```
ua.bat
```

Provide the required information in each of the Upgrade Assistant screens. The screens that you see vary depending on the type of upgrade you select.

4.3.4 Upgrading SOA Schemas with the Upgrade Assistant

The Upgrade Assistant displays a sequence of screens listed in [Table 4-1](#) when upgrading schemas. Perform the respective action(s) for each of the screens. When Oracle SOA is selected, the `_IAU`, `_MDS`, `_OPSS`, `_SOAINFRA`, and `_UMS` schemas will be included in the upgrade.

Note: If you are upgrading an ORASDPM schema that was created using RCU 11g (11.1.1.1.4 or earlier), and you subsequently upgraded ORASDPM to 11g (11.1.1.6 or later), the FMW user will need to grant the CREATE TABLE privilege to user `<prefix>_ORASDPM` before upgrading to 12c (12.2.1).

```
grant CREATE TABLE to &lt;prefix>_ORASDPM;
```

Where `<prefix>` is the name given to the schema when it was created.

Table 4-1 Upgrade Assistant Screens: Upgrading Schemas

Screen	Description and Action Required
Welcome	This screen provides an overview of the Upgrade Assistant and some information about important pre-upgrade tasks.
Schemas	Select Individually Selected Schemas .

Table 4-1 (Cont.) Upgrade Assistant Screens: Upgrading Schemas

Screen	Description and Action Required
Available Components	<p>This screen provides a list of installed Oracle Fusion Middleware components that have schemas that can be upgraded. When you select a component, the schemas and any dependencies are automatically selected.</p> <p>For example, when Oracle SOA is selected, the <code>_MDS</code> and <code>_UMS</code> schemas will be included in the upgrade.</p> <p>When Managed File Transfer is selected, Audit Services, Enterprise Scheduler and Platform Security Services will be included in the upgrade.</p>
Domain Directory	<p>This screen appears if you selected Oracle Platform Security Services or Oracle Audit Services on the Available Components screen.</p> <p>Enter the absolute path to the existing WebLogic domain directory, or click Browse to navigate to and select the 11g domain directory you are upgrading.</p>
Prerequisites	<p>Check that the prerequisites for schema upgrade are met. You must select each prerequisite before you click Next.</p> <p>CAUTION: Upgrade Assistant will NOT verify that these prerequisites have been met.</p>



Table 4-1 (Cont.) Upgrade Assistant Screens: Upgrading Schemas

Screen	Description and Action Required
Schema Credentials	<p>Use this screen to enter database connection details for each of the schemas you are upgrading.</p> <ol style="list-style-type: none"> 1. Select a the database type from the Database Type drop-down menu. 2. Enter the database connection details, and click Connect. 3. Select the schema you want to upgrade from the Schema User Name drop-down menu, and then enter the password for the schema. In some cases, such as <code>_ORASDPM</code>, you will need to manually enter the Schema User Name and password. NOTE: The UCSUMS schema is not auto-populated. Enter <code>prefix_ORASDPM</code> as the user. Upgrade environment uses <code>_ORASDPM</code> as the schema name, whereas in the 12c environment it is referred to as the <code>_UMS</code> schema. 4. Click Next. <p>Notes:</p> <ul style="list-style-type: none"> • The following schemas require elevated login credentials (AS SYSDBA): <code>_OPSS</code>, <code>_IAU</code>, <code>_MDS</code>, and <code>_ODI</code> • The title of Schema Credentials screen varies, depending upon the schemas you are upgrading. For example, if you are upgrading the <code>_SOAINFRA</code> schema, the screen title appears as "SOAINFRA Schema". • For information on the fields required to connect to the database, click Help, or refer to Schema Credentials.
Examine	<p>Review the status of the Upgrade Assistant as it examines each component, verifying that the component is ready for upgrade.</p> <p>Verify that the Source Version displayed for each schema is listing the correct version number for the schema to be upgraded.</p>
Upgrade Summary	<p>Review the summary of the options that you have selected for schema upgrade. Verify that the correct Source and Target versions are listed for each schema you intend to upgrade.</p> <p>Click Upgrade to upgrade the schemas, or click Back if you wish to change the configurations.</p>
Upgrade Progress	<p>Review the status of the current upgrade process.</p> <p>NOTE: The progress bar on this screen displays the progress of the current upgrade procedure. It does not indicate the time remaining for the upgrade.</p> <p>Click Next when the upgrade is complete.</p>
Upgrade Success	<p>Click Close if the Upgrade was successful.</p> <p>If the upgrade failed or if you canceled the upgrade before it completed successfully, you should review the log files, restore the backed up environment, and restart the Upgrade Assistant.</p>

4.3.5 Verifying the Schema Upgrade

Use the following SQL command to verify that the schema version in `schema_version_registry` has been properly updated.

```
SET LINE 120
COLUMN MRC_NAME FORMAT A14
COLUMN COMP_ID FORMAT A20
COLUMN VERSION FORMAT A12
COLUMN STATUS FORMAT A9
COLUMN UPGRADED FORMAT A8
SELECT MRC_NAME, COMP_ID, OWNER, VERSION, STATUS, UPGRADED FROM
SCHEMA_VERSION_REGISTRY ORDER BY MRC_NAME, COMP_ID ;
```

Check that the number in the **VERSION** column matches the latest version number for that schema. See [Schemas That Require an Upgrade](#) to verify that the updated version number is correct for your schema(s).

In the query result, the **STATUS** field will be either **UPGRADING** or **UPGRADED** during the schema patching operation, and will become **VALID** when the operation is completed.

If the status appears as **INVALID**, the schema update failed. You should examine the logs files to determine the reason for the failure.

4.3.6 Verifying the Instance Upgrade (if applicable)

If instances were upgraded as part of your schema upgrade, verify that there were no errors with the instances.

- If the Upgrade Assistant reports that there are no additional instances to be upgraded, then simply close the Upgrade Assistant UI and continue with the remaining upgrade procedures (launching the Reconfiguration Wizard for example).
- If the Upgrade Assistant reports that there was an error during the instance upgrade, then correct the error(s) and resubmit the database job to complete the upgrade. You can also use the Report Upgrade Summary administration script (Option 1) to check the `UPGRADE ERROR COUNT` section of the report. For more information, see [Resolving Instance Upgrade Errors](#).
- If there are still closed instances to be upgraded, then you will be notified that the upgrade of the closed instances will continue in the background after you close the Upgrade Assistant. **Do not close the Upgrade Assistant until UA reports it is finished and you see the following:**

Oracle SOA

1. The Upgrade Assistant has successfully upgraded all active instances. You can now close the Upgrade Assistant.

2. The automated upgrade of closed instances will continue in the background after the Upgrade Assistant is exited and until the SOA server is started, at which point the upgrade will stop. You can schedule the upgrade of any remaining closed instances for a time when the SOA server is less busy.

Close the Upgrade Assistant and use the instance data administration scripts to administer and monitor the overall progress of this automated upgrade. For more information see "Administering and Monitoring the Upgrade of SOA Instance Data" in [Upgrading SOA Suite and Business Process Management](#).

4.3.7 Checking for Invalid Database Objects

If you are using an Oracle database, you should recompile database objects after running the Upgrade Assistant by connecting to the database as `SYS` and running the following from SQL*Plus:

```
SQL>@?/rdbms/admin/utlrp.sql
```

This will compile the database objects that were upgraded by Upgrade Assistant.

Then issue the following query to ensure there are no longer any invalid database objects:

```
SELECT owner, object_name FROM all_objects WHERE
status='INVALID' ;
```

None of the database objects for the upgraded schema should be invalid at this point. If there are any, run the `utlrp.sql` command again and check again. If the problem persists, you should file a service request.

4.3.8 Upgrading Partitioned Schema Tables from 11g

If you are upgrading an Oracle SOA 11g installation that includes schemas partitioned as described in the *Oracle SOA Suite 11g Administration Guide*, and you want to continue with this specific table partitioning strategy in SOA 12c (12.2.1), then you must complete these required steps to upgrade your partitioned schema tables.

Note: This procedure is required only if you plan to use the existing Oracle SOA 11g table partitioning strategy in your upgraded 12c environment. If you are upgrading from a previous 12c release, you will not need to complete this procedure.

Understanding the Upgrade of Partitioned Schema Tables

Oracle SOA Suite 12c introduces a new set of Fabric tables on which the equi-partitioning strategy is based. The procedure described below enables you to align the existing 11g strategy with the new 12c Fabric tables without rebuilding the dependent Service Engine tables like `BPEL`, for example. The partition alignment will model the new Fabric 12c table partitions against the now obsolete 11g `COMPOSITE_INSTANCE` partitions (which all other/existing partitions should already be aligned). The new 12c Fabric Table that will drive the equi-partitioning strategy is called "`SCA_FLOW_INSTANCE`".

Before You Begin

Review the following to understand how the upgrade may impact your deployment:

- To align the new SOA 12c Fabric tables, dummy/empty `RANGE` partitions will be added which are modeled on the now obsolete 11g `composite_instance` table. This means that approximately 10 new Fabric tables will be recreated into partitioned tables.
- You can convert `RANGE` partitioning to `INTERVAL-RANGE` partitioning during this process as Oracle Fusion Middleware SOA Suite 12c now supports both.

You can chose to continue with `RANGE` partitioning or convert to `INTERVAL-RANGE` partitioning as part of this process. An `INTERVAL-RANGE` table can house

both RANGE and INTERVAL-RANGE partitions with the first partition always being a RANGE partition (called a transition point). Note that when the tables are converted to INTERVAL-RANGE, there will still be the existing RANGE partitions until new INTERVAL-RANGE partitions are automatically allocated.

- The 11g SOA strategy did not provide any recommendations on the use of a MAXVALUE partitions. If you choose to convert to INTERVAL-RANGE partitioning and the MAXVALUE partition is not empty, then the table will need to be rebuilt. However, if the MAXVALUE partition is empty then it will just be dropped as part of the conversion to INTERVAL-RANGE. However, if the MAXVALUE partition is empty, then it will be dropped as part of the conversion. (INTERVAL-RANGE partitioning does not allow a MAXVALUE partition as partitions are automatically allocated.)
- The process involves the use of the TRS (Table Recreation Scripts) utility. You will be required to edit some of the generated scripts. The editing is required to correct the DDL syntax, as the generated DDL can vary between installations and RDBMS versions or may have been customized.
- The verification scripts in 12.2.1 are upgrade-aware and consider the instances in both the 12c sca_flow_instance and 11g composite_instance tables.

Note: Oracle recommends that you create a complete backup of the schemas and database before starting this process. Oracle also recommends that you execute this procedure in a test environment before attempting in production (including the verification scripts).

Process Overview

The upgrade of partitioned schema tables happens in two phases:

Phase 1: Generate the DDL script.

- Correct partition keys
- Honor any DDL changes
- Partition new 12c Fabric tables
Creates Dummy RANGE partitions modeled against “composite_instance”
- Handle MAXVALUE partition (if interval required)

Phase 2: Edit and run the DDL script.

- Edit the DDL script.
- Execute DDL script.
- Check Log files.

Phase 1: Generating the DDL Script

1. As SYSDBA, create TRS_DIR and grant read, write to <soainfra>..

```
SQL > create directory TRS_DIR as '../..';  
SQL> grant read,write on directory TRS_DIR to <soainfra>
```

2. Enable debug mode.

```
ALTER PROCEDURE debug_purge  COMPILE PLSQL_CCFLAGS = 'debug_on:TRUE' || REUSE
SETTINGS;
ALTER PROCEDURE log_info COMPILE PLSQL_CCFLAGS = 'debug_on:TRUE' REUSE ||
SETTINGS;
```

3. Navigate to the following directory:

```
12C_mwhome/soa/common/sql/soainfra/sql/oracle/122100/trs12/
```

4. Edit trs_migrate_exec.sql for any changes you require. The table below describes the parameters and available options:

Parameter	Options
range_interval	R (range) or I (interval)
interval_clause	'NUMTOYMINTERVAL(1, "MONTH")' Specified by SQL conversion functions <ul style="list-style-type: none"> • NUMTODSINTERVAL converts n to an INTERVAL DAY TO SECOND literal. • NUMTOYMINTERVAL converts number n to an INTERVAL YEAR TO MONTH literal.
partition	G (group1 or 2) or P (partial) Identifies 11g partitioning strategy
drop_flag	Drop original tables; true, false
redo_flag	Generate redo; true false
DOP	Degree of parallel
sql_trace	SQL Trace; true, false If true, ensure the soainfra user has been granted "alter session" privilege.

The following shows a sample code snippet. Make sure to provide your own parameter options.

```
set echo on;
set serverout on;
DECLARE
range_interval  varchar2(1)  := 'I';
interval_clause varchar2(40) := 'NUMTOYMINTERVAL(1, 'MONTH')';
partition      varchar2(1)  := 'G';
drop_flag      boolean      := true;
redo_flag      boolean      := false;
DOP            number       := 0;
sql_trace      boolean      := false;
BEGIN
  trs_mig.trs_migrate (range_interval, interval_clause, partition, drop_flag,
    redo_flag, DOP, sql_trace);
END;
/
```

5. Run `trs_migrate_exec.sql` to generate the DDL script.

Phase 2: Editing and Executing the DDL Script

Once the DDL script has been generated, you will need to edit the script before executing it.

1. Open the generated DDL script and search for comments about the `COMPOSITE_INSTANCE` partitions. You must update the DDL of each the new Fabric table and add these partitions wherever these comments are found.

```
CREATE TABLE "PART_SOAINFRA"."SCA_FLOW_INSTANCE_M"
  (    "FLOW_ID" NUMBER(*,0),
      "FLOW_CORRELATION_ID" VARCHAR2(100),
  ...
  TABLESPACE "DEV12_SOAINFRA" ;    <REMOVE SEMICOLON
/*                                <REMOVE COMMENTS (if
any)
REM The RANGE partitions are based on COMPOSITE_INSTANCE
REM  INTERVAL(NUMTOYMINTERVAL(1, 'MONTH'))
REM  (PARTITION p0 VALUES LESS THAN (TO_DATE('2007-02-01', 'YYYY-MM-DD')),
REM  (PARTITION p1 VALUES LESS THAN (TO_DATE('2007-03-01', 'YYYY-MM-DD')));
*/
PARTITION BY RANGE (CREATED_TIME)
INTERVAL(NUMTOYMINTERVAL(1, 'MONTH'))
(
PARTITION P0 VALUES LESS THAN (TO_DATE(TIMESTAMP' 2007-02-01 00:00:00' , 'YYYY-MM-
DD')),,    <REMOVE TIMESTAMP, 00:00:00 and LAST COMMA
```

The edited script should look like this:

```
CREATE TABLE "PART_SOAINFRA"."SCA_FLOW_INSTANCE_M"
  (    "FLOW_ID" NUMBER(*,0),
      "FLOW_CORRELATION_ID" VARCHAR2(100),
  ...
  TABLESPACE "DEV12_SOAINFRA"
PARTITION BY RANGE (CREATED_TIME)
INTERVAL(NUMTOYMINTERVAL(1, 'MONTH'))
(
PARTITION P0 VALUES LESS THAN (TO_DATE('2007-02-01', 'YYYY-MM-DD')),
PARTITION P1 VALUES LESS THAN (TO_DATE('2007-03-01', 'YYYY-MM-DD')));
.
```

2. Run/test the edited DDL script in a test environment first.
3. Check the log in `TRS_DIR` for errors.
4. Test verification scripts.

4.4 Reconfiguring the Domain Using the Reconfiguration Wizard

The Reconfiguration Wizard is a new tool in 12c. It is run in conjunction with the Upgrade Assistant to upgrade your domain to 12c.

When you use the Reconfiguration Wizard to reconfigure a WebLogic Server domain, the following items are automatically updated, depending on the applications in the domain:

- WLS core infrastructure
- Domain version

Note: The Reconfiguration Wizard does not update any of your own applications that are included in the domain.

Specifically, when you reconfigure a domain the following occurs:

- The domain version number in the config.xml file for the domain is updated to the Administration Server's installed WebLogic Server version.
- Reconfiguration templates for all installed Oracle products are automatically selected and applied to the domain. These templates define any reconfiguration tasks that are required to make the WebLogic domain compatible with the current WebLogic Server version.
- Start scripts are updated.

Note: Once the domain reconfiguration process starts, it is irreversible. Prior to running the Reconfiguration Wizard, ensure that you have backed up the domain as described in [Backing Up the Domain](#). If an error or other interruption occurs while running the Reconfiguration Wizard, you must restore the domain by copying the files and directories from the backup location to the original domain directory. This is the only way to ensure that the domain has been returned to its original state prior to reconfiguration.

Follow these instructions to reconfigure the existing domain using the Reconfiguration Wizard. For general information about how the domain is reconfigured, see [Reconfiguring WebLogic Domains](#).

[Backing Up the Domain](#)

Prior to running the Reconfiguration Wizard, make a backup copy of the domain directory.

[Starting the Reconfiguration Wizard](#)

[Reconfiguring the Domain](#)

4.4.1 Backing Up the Domain

Prior to running the Reconfiguration Wizard, make a backup copy of the domain directory.

1. Copy the source domain to a separate location to preserve the contents.
For example, copy C:\domains\mydomain to C:\domains\mydomain_backup.
2. Prior to updating the domain on each remote Managed Server, make a backup copy of the domain directory on each remote machine..
3. Verify that the backed up versions of the domain are complete.

If domain reconfiguration fails for any reason, you must copy all files and directories from the backup directory into the original domain directory to ensure that the domain is returned entirely to its original state prior to reconfiguration.

4.4.2 Starting the Reconfiguration Wizard

Start the Reconfiguration Wizard in graphical mode by doing the following:

1. Log in to the system on which the domain resides.
2. Open the command shell (on UNIX operating systems) or open a command prompt window (on Windows operating systems).
3. **Edition Based Database Users Only:** If your schemas are configured with EBR database, a default edition name must be manually supplied before you run the Reconfiguration Wizard.

Run the following SQL command to set the default edition:

```
ALTER DATABASE DEFAULT EDITION = edition_name;
```

where `edition_name` is the name of the child edition name.

4. Go to the following directory:

(UNIX Operating Systems) `ORACLE_HOME/oracle_common/common/bin`

(Windows Operating Systems) `ORACLE_HOME\oracle_common\common\bin`

where `ORACLE_HOME` is your Oracle home directory.

5. Execute the following command:

```
(UNIX Operating Systems) ./reconfig.sh -log=<log_file> -log_priority=ALL
```

```
(Windows Operating Systems) reconfig.cmd -log=<log_file> -log_priority=ALL
```

Replace `log_file` with the absolute path of the log file you'd like to create for the domain reconfiguration session. This can be helpful if you need to troubleshoot the reconfiguration process.

The parameter `-log_priority=ALL` ensures that logs are logged in fine mode.

Note:

When you run the `reconfig.cmd` or `reconfig.sh` command, the following error message might be displayed to indicate that the default cache directory is not valid:

```
*sys-package-mgr*: can't create package cache dir
```

You can change the cache directory by setting the environment variable `CONFIG_JVM_ARGS`. For example:

```
CONFIG_JVM_ARGS=-Dpython.cachedir=valid_directory
```

4.4.3 Reconfiguring the Domain

The Reconfiguration Wizard displays a sequence of screens listed in [Table 4-2](#). Perform the respective action(s) for each of the screens. Note that you may not see

every screen listed below. In addition, you may need to complete additional screens based on your environment setup. For more information, see Reconfiguring WebLogic Domains.

Table 4-2 Reconfiguration Wizard Screens

Reconfiguration Wizard Screen	Description and Action Required
Select Domain	Enter the absolute path to the existing domain directory, or click Browse to navigate to and select the domain directory.
Reconfiguration Setup Progress	Shows the progress of applying the reconfiguration templates.
Domain Mode and JDK	<p>Domain mode cannot be changed.</p> <p>Select the JDK to use in the domain or click Browse to navigate to the JDK you want to use.</p> <p>Note that Oracle Fusion Middleware 12c requires Java SE 7. For more information, see Verifying Certification and System Requirements.</p>
Database Configuration Type	<p>Use the RCU Data option to connect to the Server Table (<code>_STB</code>) schema. The Repository Creation Utility (RCU) will automatically use service table schema to load the other 12c schema credentials automatically. Always verify the data on the JDBC screens that follow.</p> <p>NOTE: For any existing 11g datasources, the reconfiguration will preserve the existing values. For new datasources where the schema was created by 12c RCU, the default connection data will be retrieved from the <code>_STB</code> schema. If no connection data for a given schema is found in the <code>_STB</code> schema, then the default connection data is used.</p> <p>For more information, click Help, or refer to Database Configuration Type.</p>
JDBC Data Sources	<p>This screen is displayed if you created custom data sources for a database-based OPSS security store or Audit Data store in 11g.</p> <p>Use this screen to configure the JDBC data sources defined in your domain source.</p> <p>For information about the fields on this page, click Help, or refer to JDBC Data Sources.</p>
JDBC Data Sources Test	<p>Test the data source connections you configured on the JDBC Data Sources screen.</p> <p>For information about the fields on this page, click Help, or refer to JDBC Data Sources Test.</p>

Table 4-2 (Cont.) Reconfiguration Wizard Screens

Reconfiguration Wizard Screen	Description and Action Required
JDBC Component Schema	<p>Specify the data source settings for each of the schemas listed on the screen, by selecting the check box adjacent to each schema name.</p> <p>Notes:</p> <ul style="list-style-type: none"> You must specify the 11g schema details for the schemas that you just upgraded. For the others, specify the 12.2.1 schema details. For information about the fields on this page, click Help, or refer to JDBC Component Schema.
JDBC Component Schema Test	<p>Test the configurations that you specified for the data sources in the previous screen. Select the check boxes adjacent to the names of the schemas to test, and click Test Selected Connections.</p> <p>The result of the test is indicated in the Status column. Click Next when the test is successful for all the schemas.</p>
Node Manager	<p>This screen is displayed only if the domain you are reconfiguring is currently using a per-host Node Manager. Use this screen to select the Node Manager configuration to use for the reconfigured domain. The resulting configuration depends on the combination of options you select for Node Manager Type and Node Manager Configuration.</p> <p>For information on per-domain and per-host Node Manager configurations, see Default Node Manager Configuration.</p>
Advanced Configuration	<p>The categories that are listed on this screen depend on the resources defined in the templates you selected for the domain during domain configuration.</p> <p>For example, when the SOA Suite and BPM template is being applied to the domain, select the Managed Servers, Clusters and Coherence if one or more of the following applies:</p> <ul style="list-style-type: none"> You have more than one managed server in a single domain (soa_server1 and bam_server1, for example) You need to modify cluster or coherence data <p>For information on using the other advanced configuration options, such as Node Manager, Deployments and Services, Domain Front End Host Capture and JMS File Store, see the online help.</p>

Table 4-2 (Cont.) Reconfiguration Wizard Screens

Reconfiguration Wizard Screen	Description and Action Required
Managed Servers	<p>You must specify the actual hostname for the Listen Address for each managed server in your domain.</p> <p>Do not use the default localhost or All Local Addresses option.</p> <p>You must specify the actual hostname as <i>hostname.company.com</i></p> <p>When upgrading from 12.1.3 to 12.2.1, you must assign the server to the appropriate Server Groups.</p>
Assign Servers to Machines	<p>If you have created servers as part of the upgrade process, then select the server name in the Servers list box and target them to the correct Node Manager Machine.</p> <p>Otherwise, no action is required on this screen when you are upgrading or reconfiguring the domain.</p>
Assign Servers to Clusters	<p>Cluster Upgrades Only: If you are upgrading clusters, use this screen to assign Managed Servers to clusters.</p> <p>Note that only Managed Servers are displayed in the Server list box. The Administration Server is not listed because it cannot be assigned to a cluster.</p>
Configuration Summary	<p>Review the configuration summary.</p> <p>Click Reconfig to reconfigure the domain, or click Back to change the configurations.</p>
Reconfiguration Progress	<p>Review the reconfiguration progress. Click Next when the process is complete.</p>

Note: SOA UPGRADES ONLY: When OWSMPM is in its own cluster and **not** part of SOA or OSB clusters, you should target only SOA-MGD-SVRS-ONLY user extensible server group to the SOA cluster, target only OSB-MGD-SVRS-ONLY to the OSB cluster and target WSMPM-MAN-SVER server group to OWSM . When upgrading 12.1.3 to 12.2.1, you also need to target BAM-MGD-SVRS-ONLY to BAM cluster.

Table 4-2 (Cont.) Reconfiguration Wizard Screens

Reconfiguration Wizard Screen	Description and Action Required
Reconfiguration Success	Review the final status of the reconfiguration process. Click Finish to exit the Reconfiguration Wizard.

4.5 Upgrading the Domain Component Configurations Using the Upgrade Assistant

Use the Upgrade Assistant to update any remaining WebLogic component configurations within the domain.

Follow the instructions in the following sections to upgrade any additional domain component configurations using the Upgrade Assistant.

Note:

Do not start the Administration Server before launching the Upgrade Assistant.

Starting the Upgrade Assistant

The Upgrade Assistant is used to upgrade schemas, component configurations and standalone system components.

Upgrading SOA Component Configurations

4.5.1 Starting the Upgrade Assistant

The Upgrade Assistant is used to upgrade schemas, component configurations and standalone system components.

Oracle recommends that you successfully complete the upgrade of schemas and component configurations for a single domain before beginning the upgrade of another domain.

Note: The Upgrade Assistant should be run by a non-SYSDBA user whenever possible. The steps to create a non-SYSDBA user are described in [Creating a Non-SYSDBA User](#).

To start the Upgrade Assistant:

1. On the Unix operating system, change directory to `ORACLE_HOME/oracle_common/upgrade/bin`.

On the Windows operating system, change directory to `ORACLE_HOME\oracle_common\upgrade\bin`.

2. Enter the following command to start the Upgrade Assistant:

On UNIX operating systems:

```
./ua
```

On Windows operating systems:

```
ua.bat
```

Provide the required information in each of the Upgrade Assistant screens. The screens that you see vary depending on the type of upgrade you select.

4.5.2 Upgrading SOA Component Configurations

The Upgrade Assistant displays a sequence of screens listed in [Table 4-3](#) when upgrading WebLogic Component Configurations. Perform the respective action(s) for each of the screens.

NOTE: The screens you see are based on your environment. You may or may not see all of the screens described below. For more information on using the Upgrade Assistant screens, see the online help.

Note:

Additional configuration tasks may be required.

After the Upgrade Assistant has successfully completes the upgrade of your schemas and component configurations, you may need to perform the tasks described in [Performing Post Upgrade Tasks](#) to ensure that your components continue to function as expected.

Table 4-3 Upgrade Assistant Screens: Upgrading WebLogic Component Configurations

Screen	Description and Action Required
Welcome	This screen provides an overview of the Upgrade Assistant and some information about important pre-upgrade tasks. Click Next to continue.
WebLogic Components	Select the All Configurations Used by a Domain option to upgrade component configurations for a managed WebLogic Server domain. You must enter the domain directory for the domain that you are upgrading now. Click Next .
OWSM Policy Manager	This screen is displayed if your 11g environment has multiple WebLogic Server domains, but the OWSM Policy Manager is only in one WLS domain and the OWSM agents are in other domains. Provide the credentials for the WebLogic Administration Server domain where the Oracle Web Services Manager (OWSM) Policy Manager is deployed. For information about the fields on this page, click Help , or refer to OWSM Policy Manager.
Component List	This screen provides a list of components that will be included in the domain component configuration upgrade.
Prerequisites	Check if the prerequisites for component configurations upgrade are met. CAUTION: The Upgrade Assistant will not validate that these prerequisites have been performed.

Table 4-3 (Cont.) Upgrade Assistant Screens: Upgrading WebLogic Component Configurations

Screen	Description and Action Required
UMS Configuration	This screen is presented if there are remote managed servers hosting UMS 11g configuration files. You must provide the credentials to these servers so that the Upgrade Assistant can access the configuration files. NOTE: You may be required to manually copy the UMS configuration files if the Upgrade Assistant is unable to locate them. See Upgrade Assistant: Copying UMS Configuration Files.
Examine	Review the status of the Upgrade Assistant as it examines each component, verifying that the component is ready for upgrade.
Upgrade Summary	Review the summary of the options that you have selected for schema upgrade. Click Upgrade to upgrade the schemas, or click Back if you wish to change the configurations.
Upgrade Progress	Review the status of the upgrade process. Click Next when the upgrade is complete.
Upgrade Success	Click Close if the Upgrade was successful. If the upgrade failed or if you canceled the upgrade before it completed successfully, you should review the log files, restore the backed up environment, and restart the Upgrade Assistant.

4.6 Upgrading Oracle Business Process Management (BPM) Web Forms

Most Oracle Business Process Management (BPM) Web Forms developed with BPM 11g (11.1.1.7.0) are compatible with 12c. There are a small number of cases where manual spacings are specified between elements and these forms may not work correctly in 12c. These forms must be upgraded manually. Without manual intervention, these forms will be in suspended mode. Those forms which do not use these manual layouts will work fine without migration.

To upgrade BPM Web Forms, a user with administrative privileges should navigate to the following URL and enter the administrator credentials when prompted.

```
http://hostname:port/workflow/DefaultToDoTaskFlow/migratewebforms
```

Loading this page starts the upgrade and shows the upgraded forms. If there are any errors, check the log file and if the error is recoverable, you can try loading the page again. If the error is not recoverable, try to deploy the BPM composite with the failed forms.

Note:

The URL can be launched multiple times, but the upgrade should not be run when there are active users using the web forms.

4.7 Managing Your Upgraded Oracle Fusion Middleware 12c Software

[Table 4-4](#) lists some common administration tasks you will likely want to perform after upgrading to Oracle SOA Suite and Business Process Management 12c (12.2.1). In addition, the component-specific administration guides may provide additional configuration tasks to perform after an upgrade.

Table 4-4 Basic Administration Tasks

Task	Description	More Information
Performing additional post-upgrade configuration steps for your component.	In addition to the post-upgrade tasks described Performing Post Upgrade Tasks , you may also need to perform additional configuration tasks to ensure your newly upgraded components function as expected.	<ul style="list-style-type: none"> • <i>Administering Oracle Fusion Middleware</i> • <i>Administering Oracle SOA Suite and Oracle Business Process Management Suite</i> • <i>Administering Oracle Service Bus</i> • <i>Administering Oracle User Messaging Service</i>
Getting familiar with Fusion Middleware administration tools	Get familiar with the various tools available which you can use to manage your environment.	Overview of Oracle Fusion Middleware Administration Tools
Configuring Secure Sockets Layer (SSL)	Learn how to set up secure communications among between Oracle Fusion Middleware components using SSL.	Configuring SSL in Oracle Fusion Middleware
Monitoring Oracle Fusion Middleware	Learn how to keep track of the status of Oracle Fusion Middleware components.	Monitoring Oracle Fusion Middleware

Upgrading Oracle SOA Suite and Business Process Management from a Previous 12c Release

The upgrade procedures vary depending on your starting point and the components in your existing domain. If you are upgrading from a previous 12c release, use these steps to upgrade to this release.

Select one of the following upgrade paths:

[Upgrading to SOA Suite and Business Process Management 12c from a Previous 12c Release](#)

Follow these steps to upgrade your Oracle SOA Suite and Business Process Management 12c deployment to this 12c release.

[Upgrading Oracle SOA Suite with Business Activity Monitoring \(BAM\) 12c from a Previous 12c Release](#)

If your existing 12c (12.1.3) deployment includes SOA Suite with Business Activity Monitoring (BAM), you will need to complete the following tasks to upgrade to the 12c (12.2.1) release.

[Targeting Server Groups Using the Reconfiguration Wizard](#)

When upgrading from a previous 12c release, you must manually target your servers to the appropriate server groups using the Reconfiguration Wizard.

5.1 Upgrading to SOA Suite and Business Process Management 12c from a Previous 12c Release

Follow these steps to upgrade your Oracle SOA Suite and Business Process Management 12c deployment to this 12c release.

If you are already running Oracle SOA Suite 12c, and want to upgrade to this version of Oracle SOA Suite and Business Process Management, you must complete the following tasks.

Note: If your Oracle SOA Suite 12c domain includes Business Activity Monitor (BAM), see [Upgrading Oracle SOA Suite with Business Activity Monitoring \(BAM\) 12c from a Previous 12c Release](#)

1. Complete the Oracle Fusion Middleware pre-upgrade checklist and perform any tasks related to your environment. [Pre-Upgrade Checklist](#)

Before you begin any upgrade, you must make sure that you have satisfied the required prerequisites for upgrading to this version of Oracle Fusion Middleware.

Also, make sure that you have created a complete backup before attempting any upgrades.

2. Complete any SOA-specific pre-upgrade tasks for your deployment. [Performing SOA-Specific Pre-Upgrade Tasks](#)

If your upgrade will include other components, review the component-specific pre-upgrade procedures.

3. Run the Pre-Upgrade Readiness Check again, if needed.

As part of the Oracle Fusion Middleware [Pre-Upgrade Checklist](#), you completed an initial pre-upgrade readiness check. Run the readiness check again just before you begin the upgrade.

Change directory to `ORACLE_HOME/oracle_common/upgrade/bin` on Unix operating systems or `ORACLE_HOME\oracle_common\upgrade\bin` on Windows operating systems.

On UNIX operating systems:

```
./ua -readiness
```

On Windows operating systems:

```
ua.bat
```

4. Start the Upgrade Assistant, again, to upgrade your schemas:

You can upgrade all schemas in the domain or individually select schemas to upgrade.

On UNIX operating systems:

```
./ua
```

On Windows operating systems:

```
ua.bat
```

Complete the Upgrade Assistant screens as described in the standard upgrade procedure: [Upgrading Schemas with the Upgrade Assistant](#)

5. Start the Reconfiguration Wizard to reconfigure the domain.

On UNIX operating systems:

```
ORACLE_HOME/oracle_common/common/bin
```

On Windows operating systems:

```
ORACLE_HOME\oracle_common\common\bin
```

where `ORACLE_HOME` is your Oracle home directory.

On UNIX operating systems:

```
./reconfig.sh -log=<log_file> -log_priority=ALL
```

On Windows operating systems:

```
reconfig.cmd -log=<log_file> -log_priority=ALL
```


Complete the Reconfiguration Wizard screens as described in the standard reconfiguration procedure: [Reconfiguring the Domain](#)

6. Start the Upgrade Assistant again to update the domain's component configurations.

Complete the Upgrade Assistant screens as described in the standard component configuration procedure: [Upgrading the Domain Component Configurations Using the Upgrade Assistant](#)

5.2 Upgrading Oracle SOA Suite with Business Activity Monitoring (BAM) 12c from a Previous 12c Release

If your existing 12c (12.1.3) deployment includes SOA Suite with Business Activity Monitoring (BAM), you will need to complete the following tasks to upgrade to the 12c (12.2.1) release.

1. Complete all required pre-upgrade tasks.

You must complete the pre-upgrade tasks before you begin this process. Refer to the [Pre-Upgrade Checklist](#) and any SOA-specific tasks that may be required for your deployed applications.

Note: Due to the complexity of the BAM 12c upgrade, it is strongly encouraged that you back up your environment before beginning this upgrade process.

2. Run a pre-upgrade readiness check using the Upgrade Assistant in `-readiness` mode.

Launch the Upgrade Assistant from the 12.2.1 Oracle home to review your 12.1.3 domain for upgrade readiness.

UNIX operating system users, navigate to `oracle_common/upgrade/bin` of the 12.2.1 Oracle home

Execute the following command: `./ua - readiness`

3. Upgrade the 12.1.3 schemas to 12.2.1 using the Upgrade Assistant 12c (12.2.1).

Launch the Upgrade Assistant from the 12.2.1 Oracle home to upgrade the 12.1.3 schemas.

UNIX operating system users, navigate to `oracle_common/upgrade/bin` of the 12.2.1 Oracle home

Execute the following command: `./ua`

Complete the Upgrade Assistant screens as described in the standard upgrade process: [Upgrading Schemas Using the Upgrade Assistant](#)

4. Upgrade the domain configurations using the Reconfiguration Wizard 12c (12.2.1).

Launch the Reconfiguration Wizard from the 12.2.1 Oracle home to upgrade the 12.1.3 domain.

UNIX operating system users, navigate to:

`oracle_common/common/bin` of the 12.2.1 Oracle home

Execute the following command: `./reconfig.sh`

Complete the Reconfiguration Wizard screens as described in the standard reconfiguration process: [Reconfiguring the Domain Using the Reconfiguration Wizard](#)

IMPORTANT: You must complete these additional tasks while running the Reconfiguration Wizard:

- a. On the **Component Datasources** screen, change the BAM Leasing Schema schema owner name to your newly created schema name. The schema owner name may incorrectly show `DEV_WLS_RUNTIME`.
- b. Complete the Reconfiguration Wizard Managed Server screen as described in [Targeting Server Groups Using the Reconfiguration Wizard](#)

5.3 Targeting Server Groups Using the Reconfiguration Wizard

When upgrading from a previous 12c release, you must manually target your servers to the appropriate server groups using the Reconfiguration Wizard.

If you are upgrading a domain that was created in a previous 12c release (such as 12.1.3), you **MUST** target your servers to the correct Server Groups during the domain reconfiguration phase of the upgrade. Failure to target these servers may result in a failed upgrade and excess downtime.

1. Launch the Reconfiguration Wizard.

(UNIX) `ORACLE_HOME/oracle_common/common/bin`

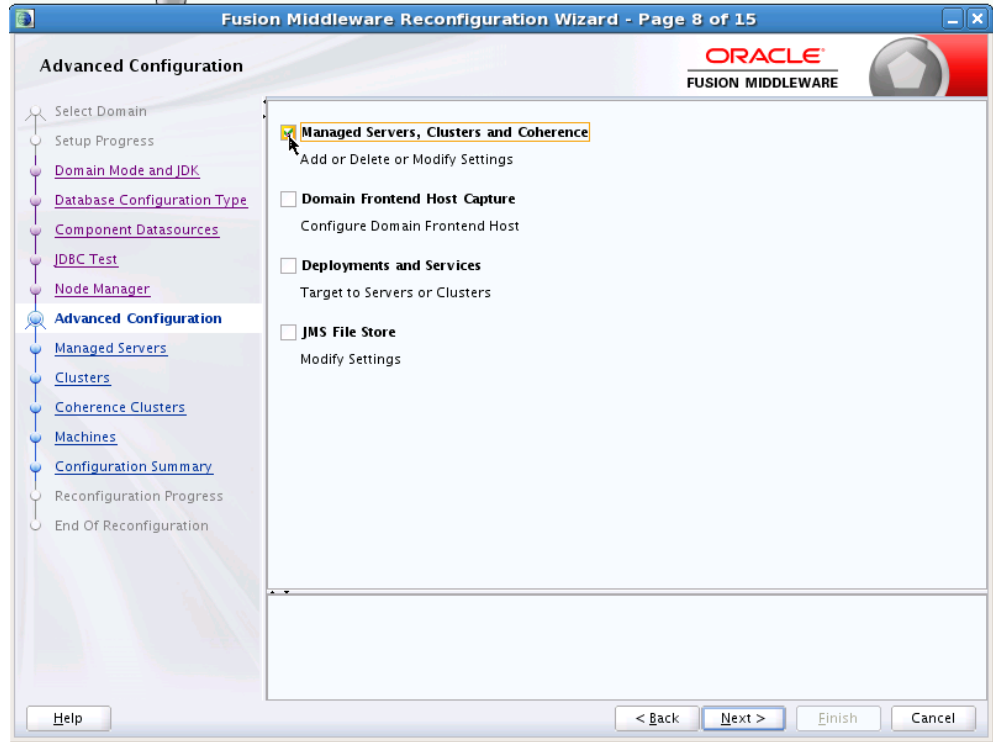
(Windows) `ORACLE_HOME\oracle_common\common\bin`

where `ORACLE_HOME` is your Oracle home directory.

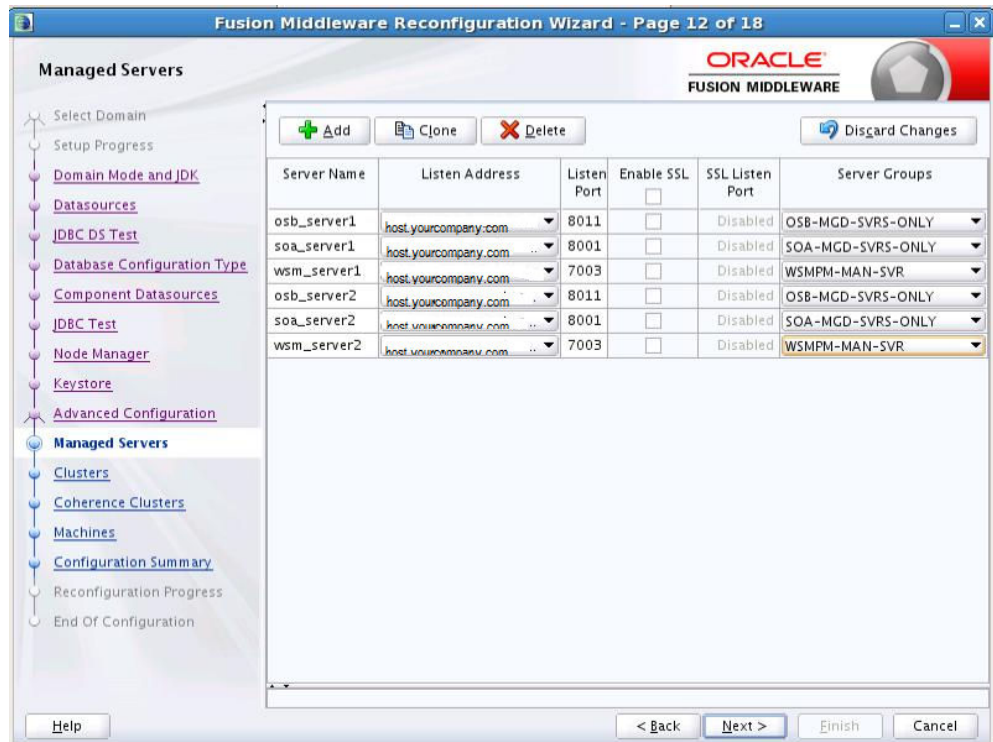
(UNIX) `./reconfig.sh -log=<log_file> -log_priority=ALL`

(Windows) `reconfig.cmd -log=<log_file> -log_priority=ALL`

2. Navigate to the **Advanced Configuration** screen and select **Managed Servers, Clusters, and Coherence**.



3. On the **Managed Servers** screen, target each server to the correct **Server Group** by selecting the correct group name from the Server Groups drop-down menu.



Note: When OWSMPM is in its own cluster and **not** part of SOA or OSB clusters, you should target only SOA-MGD-SVRS-ONLY user extensible server group to the SOA cluster, target only OSB-MGD-SVRS-ONLY to the OSB cluster and target WSMPPM-MAN-SVER server group to OWSM . When upgrading 12.1.3 to 12.2.1, you also need to target BAM-MGD-SVRS-ONLY to BAM cluster.

Component and Server	Server Group
SOA (soa_server1)	SOA-MGD-SVRS-ONLY
Oracle Service Bus — OSB (osb_server1)	OSB-MGD-SVRS-ONLY
Business Activity Monitoring — BAM (bam_server1)	BAM-MGD-SVRS-ONLY
Managed File Transfer — MFT (mft_server1)	MFT-MGD-SVRS-ONLY

Each of the servers should now be targeted to the correct server group and should not show as Unspecified.

Upgrading a Clustered SOA Environment

Describes the process of upgrading to a clustered SOA environment and performing post-upgrade configuration tasks.

[Understanding the SOA Cluster Upgrade Topology](#)

[Using Secured Task Forms in a Clustered Topology](#)

The task form is a Java Server Page XML (.jspx) file that you create in the Oracle JDeveloper designer where you created the SOA composite containing the human task.

[Upgrading a Clustered Topology](#)

[Propagating Domain Configuration on SOAHOST2](#)

Use these steps to propagate the newly upgraded files to another host.

[Post-Upgrade Tasks for Cluster Upgrades](#)

6.1 Understanding the SOA Cluster Upgrade Topology

[Figure 6-1](#) shows a sample topology of a clustered Oracle SOA Suite deployment with SOA, Oracle Web Services Manager (OWSM), Oracle Service Bus (OSB) and Oracle Business Activity Monitoring (Oracle BAM) in separate clusters across two application hosts, SOAHOST1 and SOAHOST2. The Oracle HTTP Server, Administration Server, Oracle Enterprise Manager Fusion Middleware Control and database are shared with both hosts.

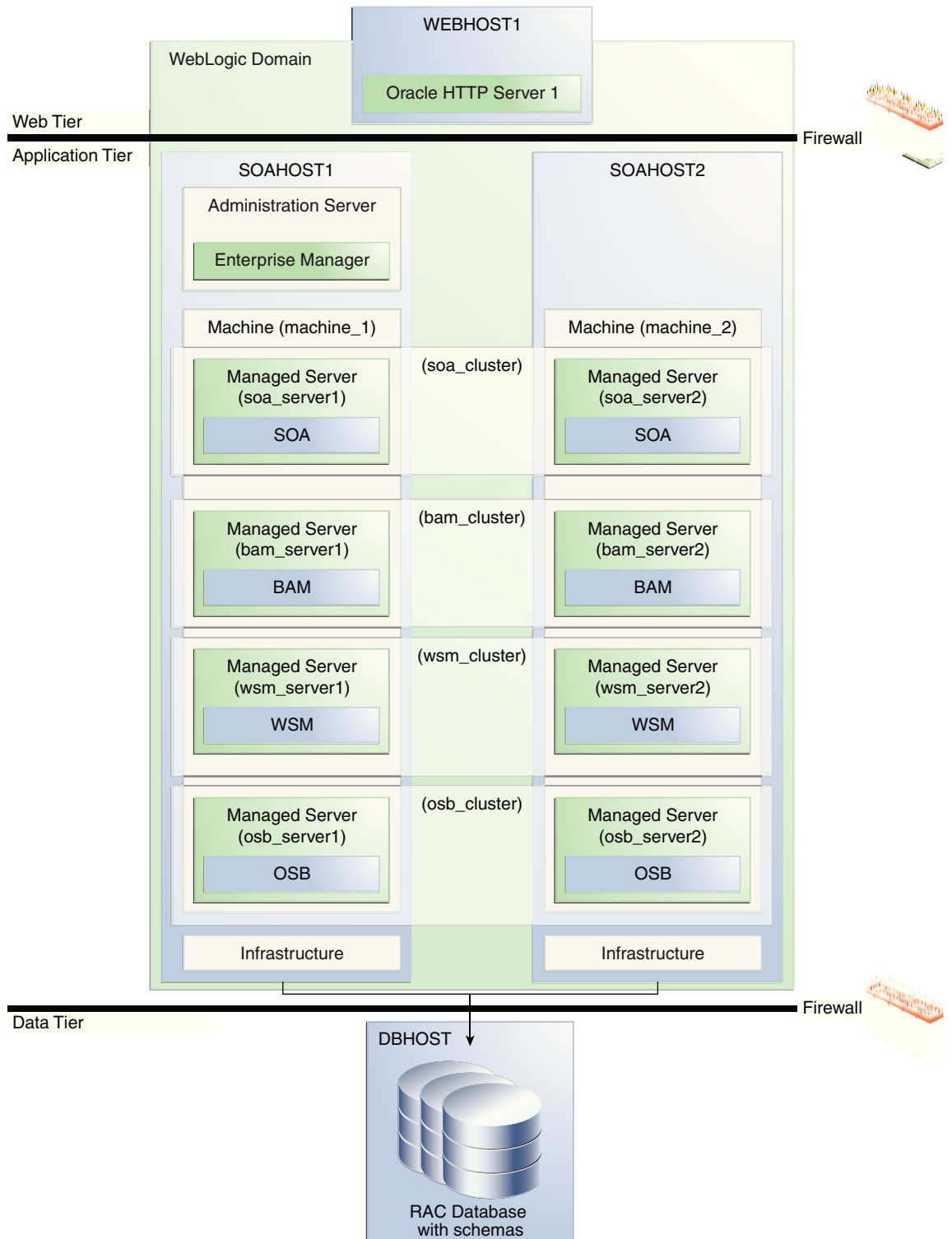
Specifically, this chapter describes the steps required to upgrade a WebLogic domain that contains multiple WebLogic Server clusters that are scaled out to multiple host computers. You can apply the concepts and procedures in this chapter to your own specific Oracle SOA Suite environment.

The steps required to upgrade this sample topology are described in the next section in [Table 6-1](#).

Note:

If you are upgrading Oracle BAM with SOA, see [Upgrading a SOA with Oracle BAM Domain to 12c](#).

Figure 6-1 Clustered SOA Topology



6.2 Using Secured Task Forms in a Clustered Topology

The task form is a Java Server Page XML (.jspx) file that you create in the Oracle JDeveloper designer where you created the SOA composite containing the human task.

If your SOA composite includes a human task form, or if task forms are deployed on non-SOA servers, then you must secure the task form after the upgrade.

6.3 Upgrading a Clustered Topology

[Table 6-1](#) lists the steps required to upgrade the example clustered, multi-host Oracle SOA Suite topology illustrated in [Figure 6-1](#).

Table 6-1 Oracle SOA Suite and BPM Cluster Upgrade Roadmap

Task	For More Information
Complete all of the applicable pre-upgrade tasks described in the Oracle Fusion Middleware Upgrade Checklist. CAUTION: Do not continue with the upgrade until this task has been completed.	Oracle Fusion Middleware 12c Pre-Upgrade Checklist
Review the upgrade topology, and identify SOAHOST1 and SOAHOST2 on your setup.	See, Understanding the SOA Cluster Upgrade Topology
Shut down the Administration Server, all the Managed Servers, and the Node Managers running on SOAHOST1 or SOAHOST2.	See, Stopping SOA Servers and Processes
Install 12.2.1 Infrastructure (WebLogic Server, OWSM, and JRF), SOA, OSB, and BAM on SOAHOST1 in a new Oracle home directory.	See, Installing the 12c (12.2.1) Infrastructure Distributions Before Upgrade and Installing SOA Integrated Distributions
Perform a complete upgrade of your 11g deployment on SOAHOST1. Perform the post-upgrade configurations that apply to your environment.	See, Upgrading to SOA Suite and Business Process Management 12c (12.2.1) See Also: If BAM is part of your domain, see Upgrading a SOA with Oracle BAM Domain to 12c If OSB is part of your domain, see Upgrading Oracle Service Bus
Propagate the domain configuration of SOAHOST1 on SOAHOST2. To do this, you must pack the domain on SOAHOST1, and unpack it on SOAHOST2.	See, Propagating Domain Configuration on SOAHOST2
Start the Administration Server and the Managed Servers on SOAHOST1 and SOAHOST2.	See, Starting and Stopping Servers
Perform the necessary post-upgrade tasks.	See, Performing Post Upgrade Tasks

6.4 Propagating Domain Configuration on SOAHOST2

Use these steps to propagate the newly upgraded files to another host.

After you have completed your single node upgrade on SOAHOST1, use these steps to propagate the newly upgraded files to another node (SOAHOST2).

Executing the pack command on the server where the Admin Server and one of the Managed Servers is installed.

Copying the template file created in the previous step to SOAHOST2.

Executing the unpack command from the 12c Oracle Home on SOAHOST2.

Completing the following verification steps after the unpack.

6.4.1 Executing the pack command on the server where the Admin Server and one of the Managed Servers is installed.

In our sample topology, you would execute the following on SOAHOST1:

```
cd /12c_ORACLE_HOME/oracle_common/common/bin
./pack.sh -domain=/11g_DOMAIN_HOME -
template=domainupgradetemplate.jar -
template_name=domainupgradetemplate -managed=true
```

In this example:

- `12c_ORACLE_HOME` refers the actual path to the 12c Oracle Home directory (the installation directory for the 12.2.1 bits).
- Replace `11g_DOMAIN_HOME` with the actual path to the upgraded domain directory.
- `domainupgradetemplate.jar` is a sample name for the jar file you are creating, which will contain the domain configuration files.
- `domainupgradetemplate` is the name assigned to the domain template file.
- By default, the `domainupgradetemplate` is created in the current directory where you ran the pack command. In this example, it would be created in the following directory, but you can specify a full path for the template jar file as part of the `-template` argument to the pack command:

```
ORACLE_COMMON_HOME/common/bin/
```

The `pack` command creates a template archive (.jar) file that contains a snapshot of either an entire domain or a subset of a domain. You can use a template that contains a subset of a domain to create a Managed Server domain directory hierarchy on a remote machine.

For more information on using the pack command, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

6.4.2 Copying the template file created in the previous step to SOAHOST2.

Use the following command to copy `domainupgradetemplate.jar` file to SOAHOST2:


```
scp soadomaintemplate.jar company@SOAHOST2:12c_ORACLE_HOME/oracle_common/common/bin
```

6.4.3 Executing the unpack command from the 12c Oracle Home on SOAHOST2.

Make sure that the Admin and Managed Servers are still stopped and then execute the following `unpack` command to create a full domain or a subset of a domain used for a Managed Server domain directory on the remote machine. You may use `unpack` only with a template compatible with your current installation.

A sample `unpack` command code snippet is shown below. **Use this as an example only.** Note that you must specify the `"-overwrite_domain=true"` flag on `unpack`.

```
cd /12c_ORACLE_HOME/oracle_common/common/bin
./unpack.sh -template=domainupgradetemplate.jar -
domain=11g_DOMAIN_HOME -overwrite_domain=true
```

In this example:

- `12c_ORACLE_HOME` refers the actual path to the 12c Oracle Home directory (the installation directory for the 12.2.1 bits).
- Replace `11g_DOMAIN_HOME` with the actual path to the upgraded domain directory.
- `domainupgradetemplate.jar` is a sample name for the jar file you are creating, which will contain the domain configuration files.
- `domainupgradetemplate` is the name assigned to the domain template file.

6.4.4 Completing the following verification steps after the unpack.

1. Verify that `WL_HOME`, `SOA_ORACLE_HOME`, `UMS_ORACLE_HOME` in `setDomainEnv.sh` script from 11g domain are pointing to 12c.
See [Reapplying Customizations to setDomainEnv](#).
2. Start the Node Manager, WebLogic Administration Server, and the Managed Servers on SOAHOST1 and SOAHOST2 in the following order:
 - a. On SOAHOST1 and SOAHOST2, start the Node Manager.
 - b. On SOAHOST1, start the WebLogic Administration Server.
 - c. On SOAHOST1 and SOAHOST2, start the Managed Servers.

For more information, see [Starting and Stopping Servers](#). Carefully review the order in which Managed Servers should be started.

If you cannot start the servers or experience other technical issues, see [Troubleshooting the Upgrade](#)

Note:

During the upgrade, the Node Manager configuration files (nodemanager.properties, for example) are moved from `11g_DOMAIN_HOME/wlserver_10.3/` location to the `11g_ORACLE_HOME/domains/DOMAIN_HOME/nodemanager` location. Therefore, the node manager in 12c has to be started from the `11g_DOMAIN_HOME` domain directory.

6.5 Post-Upgrade Tasks for Cluster Upgrades

After a successful cluster upgrade, you may need to perform additional post-upgrade configurations tasks. Perform only those tasks that pertain to your clustered environment.

[Configuring Oracle HTTP Server for the WLS_OSB Managed Servers](#)

[Removing OWSM Targets from SOA and OSB Clusters](#)

[Updating OWSM Cross-Component Wiring](#)

[Reapplying an EDNTopic to SOA JMS Module After Cluster Upgrade](#)

[Preventing Duplicate Messages When Using JMS Transport Proxy Service](#)

6.5.1 Configuring Oracle HTTP Server for the WLS_OSB Managed Servers

To enable Oracle HTTP Server to route to Oracle Service Bus console and Oracle Service Bus service, set the `WebLogicCluster` parameter to the list of nodes in the cluster.

For more information, see "Configuring Oracle HTTP Server for the Oracle Service Bus" in the *Enterprise Deployment Guide for Oracle SOA Suite*.

6.5.2 Removing OWSM Targets from SOA and OSB Clusters

If your 12c domain includes an Oracle Web Services Manager (OWSM) in its own cluster and you have extended that domain with a SOA cluster and an OSB cluster, then post upgrade you must manually untarget the `wsm-pm` from the SOA and OSB clusters.

To remove the `owsm-pm` target from the SOA and OSB clusters:

1. Log in to the WebLogic Server Administration Console 12c.

Enter the following URL in a browser:

```
http://host_name:port_number/console
```

The port number is the port number of the Administration Server. By default, the port number is 7001.

The login page is displayed.

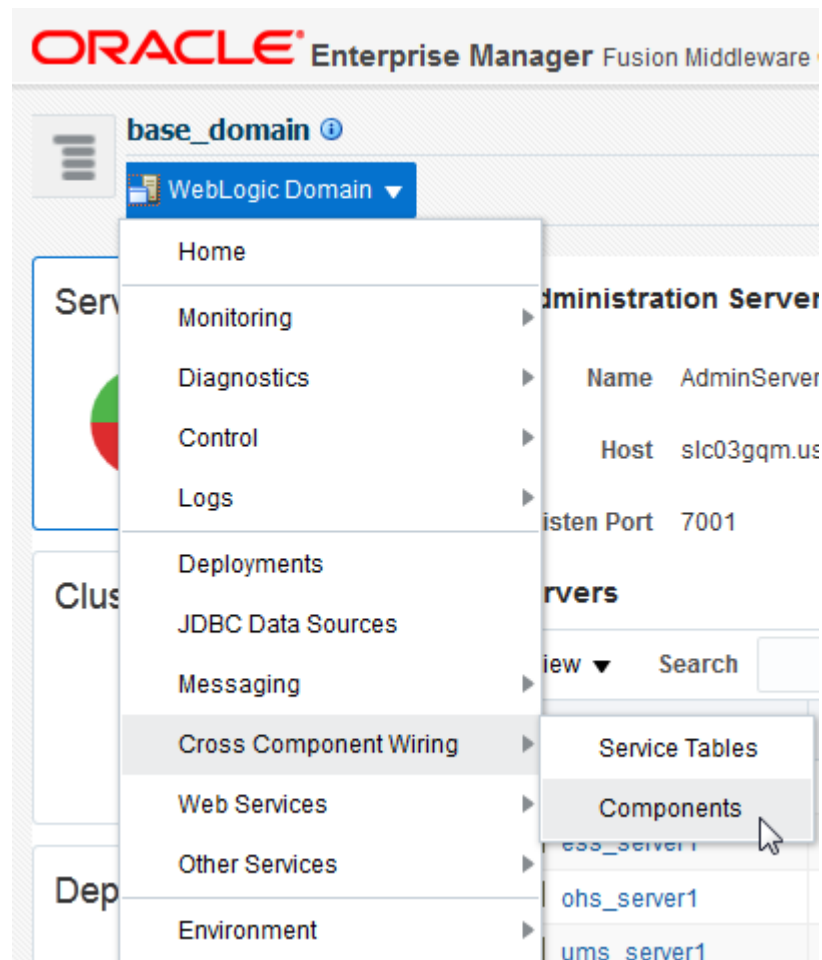
2. Select **Deployments** from Domain Structure.
3. Select **wsm-pm** under Deployments.
4. In the settings for `wsm-pm`, select **Targets**.

5. Select wsm-pm component of type Enterprise Application and select **Change Targets**.
6. Uncheck SOA cluster and OSB cluster.
7. When prompted, click **Yes** to apply the changes.
8. **REQUIRED:** Once the wsm-pm is targeted only to the OWSM cluster, you must rewire the components as described in "[Updating OWSM Cross-Component Wiring](#)".

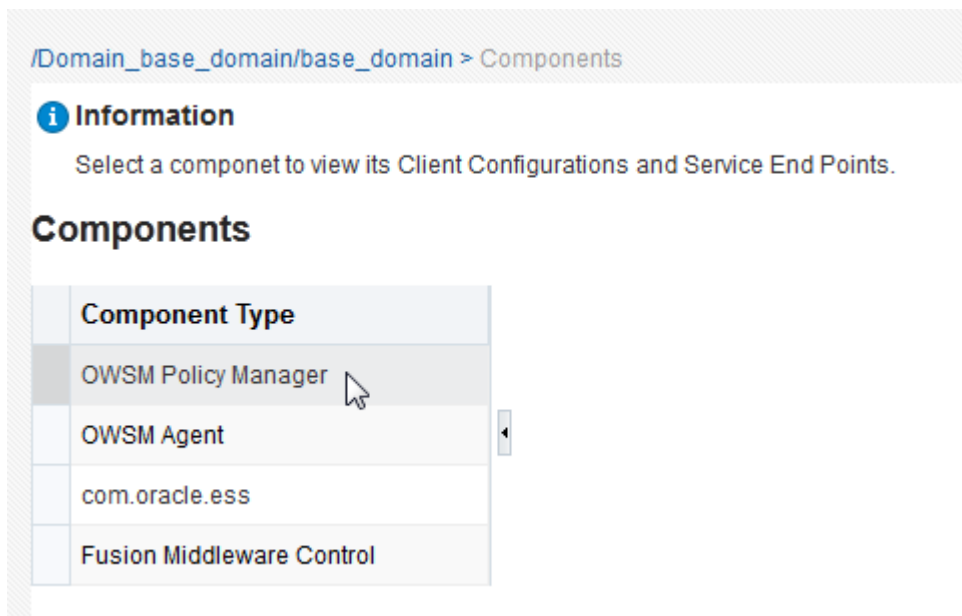
6.5.3 Updating OWSM Cross-Component Wiring

After you have removed OWSM targets from SOA and OSB clusters as described in [Removing OWSM Targets from SOA and OSB Clusters](#), you must rewire the OWSM Policy Manager components as described below:

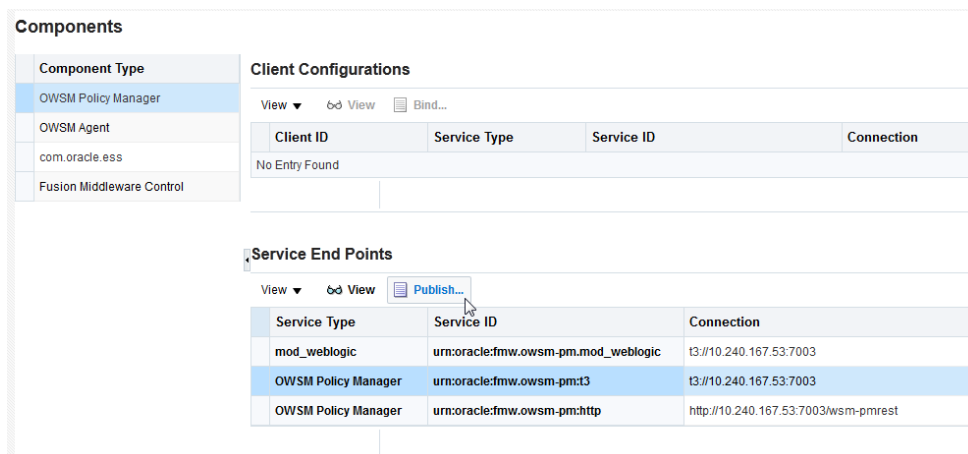
1. Start the Administration (*admin*) server and one OWSM server.
2. Log in to the Oracle Enterprise Manager Fusion Middleware Control 12c console and navigate to the **Cross Components Wiring > Components** option.



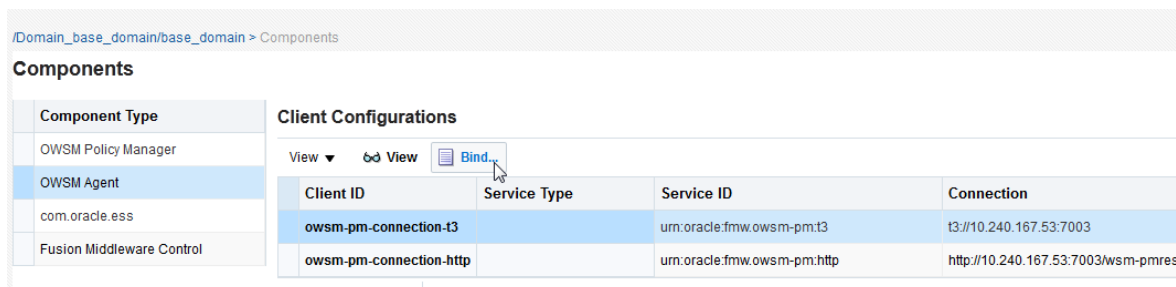
3. Select **OWSM Policy Manager** from the list of available components:



- From the Service End Points table, select the **OWSM Policy Manager t3** connection entry and click **Publish**. The status will change from Out of Sync to Published.



- Select **OWSM Agent** from the Component Type list. Select the t3 connection entry and click **Bind**.



- Verify that the Service Type for the service end point is **OWSM Policy Manager**.

Bind Client Configuration

Do you confirm the following binding?

Client Configuration	Service End Point				
Service ID urn:oracle:fmw.owsm-pm:13	Service ID urn:oracle:fmw.owsm-pm:13				
Service Type	Service Type OWSM Policy Manager				
Connection T3 Connection	Status Published				
Non-SSL URL t3://10.240.167.53:7003	Connection T3 Connection				
SSL URL	Non-SSL URL t3://10.240.167.53:7003				
Default URL t3://10.240.167.53:7003	SSL URL				
Properties	Default URL t3://10.240.167.53:7003				
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Property</th> <th style="width: 50%;">Value</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">No Property Found</td> </tr> </tbody> </table>	Property	Value	No Property Found		Properties
Property	Value				
No Property Found					
Policies	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Property</th> <th style="width: 50%;">Value</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">No Property Found</td> </tr> </tbody> </table>	Property	Value	No Property Found	
Property	Value				
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Property	Value				
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	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Property</th> <th style="width: 50%;">Value</th> </tr> </thead> <tbody> <tr> <td colspan="2" style="text-align: center;">No Property Found</td> </tr> </tbody> </table>	Property	Value	No Property Found	
Property	Value				
No Property Found					

Yes No

7. Repeat steps 5 and 6 to Bind the remaining component types. In this example, you will select com.oracle.ess and Fusion Middleware Control.

6.5.4 Reapplying an EDNTopic to SOA JMS Module After Cluster Upgrade

After upgrading a SOA Cluster domain to 12.2.1, the upgraded SOA JMS module may be missing the EDNTopic. If the JMS module is missing the EDNTopic, you must manually add the topic or UDD for this topic using the Administration Console or WLST.

See the Administration Console online help for more information on reapplying the EDNTopic.

6.5.5 Preventing Duplicate Messages When Using JMS Transport Proxy Service

In a 12c cluster domain, jmsServers are targeted to migratable targets, which is different from the default behavior in 11g where jmsServers were targeted to an individual server.

When you configure a 12c proxy service based on the JMS transport, set the **topic distribution mode** to One-Copy-Per-Application or One-Copy-Per-Server. To prevent duplicate messages, do not use Compatibility mode in a clustered environment.

Upgrading SOA with Oracle Business Activity Monitoring (Oracle BAM)

Describes the process of upgrading from a supported Oracle SOA Suite 11g environment that includes Business Activity Monitoring (Oracle BAM) to a SOA 12c (12.2.1) environment with the newly redesigned Oracle BAM 12c.

Note: If you are upgrading from a previous Oracle SOA Suite with BAM 12c release, see [Upgrading Oracle SOA Suite with Business Activity Monitoring \(BAM\) 12c from a Previous 12c Release](#)

[Understanding an Upgrade to Business Activity Monitoring in 12c](#)

Upgrading from Oracle BAM 11g to BAM 12c cannot be handled with the standard upgrade procedures. You will need to perform several manual configuration tasks to complete the upgrade.

[Understanding the SOA with Oracle BAM Upgrade Process Flow](#)

[Performing the Pre-Upgrade Tasks for Oracle BAM](#)

[Upgrading a SOA with Oracle BAM Domain to 12c](#)

Use this procedure when upgrading a SOA domain that includes Oracle BAM 11g.

[Performing Post Upgrade Configuration Tasks for Oracle SOA with Oracle BAM 12c](#)

To run the SOA 12c domain that will eventually include Oracle BAM 12c, you must perform additional configuration tasks after the upgrade.

[Extending the SOA Domain with Oracle BAM 12c](#)

When you are ready to use Oracle BAM 12c with your upgraded SOA 12c environment, you must extend the domain to include the BAM 12c templates.

[Recovering from a Failed Oracle BAM Upgrade](#)

7.1 Understanding an Upgrade to Business Activity Monitoring in 12c

Upgrading from Oracle BAM 11g to BAM 12c cannot be handled with the standard upgrade procedures. You will need to perform several manual configuration tasks to complete the upgrade.

The procedures described in the following sections apply only to upgrades from 11g. If you are upgrading an upgraded 12c domain to this 12c release, you will follow the standard upgrade procedures described in [Upgrading to SOA Suite and Business Process Management 12c \(12.2.1\)](#).

Oracle Business Activity Monitoring (BAM) 12c has been completely redesigned for use with Oracle SOA Suite 12c, so there is no direct upgrade path. The schemas, binaries, and directory structure used in Oracle BAM 12c are different than those used with Oracle BAM 11g. Therefore, upgrading from Oracle BAM 11g to BAM 12c cannot be handled with the standard upgrade procedures. You will need to perform several manual configuration tasks to complete the upgrade.

It is also important to understand that the only Oracle BAM 11g objects that can be used in your BAM 12c domain are data objects (DOs) and enterprise message sources (EMS). You will need to manually export these objects to an XML file and then import them into the BAM 12c domain. The other Oracle BAM 11g artifacts, such as dashboards for example, will have to be manually recreated in Oracle BAM 12c domain.

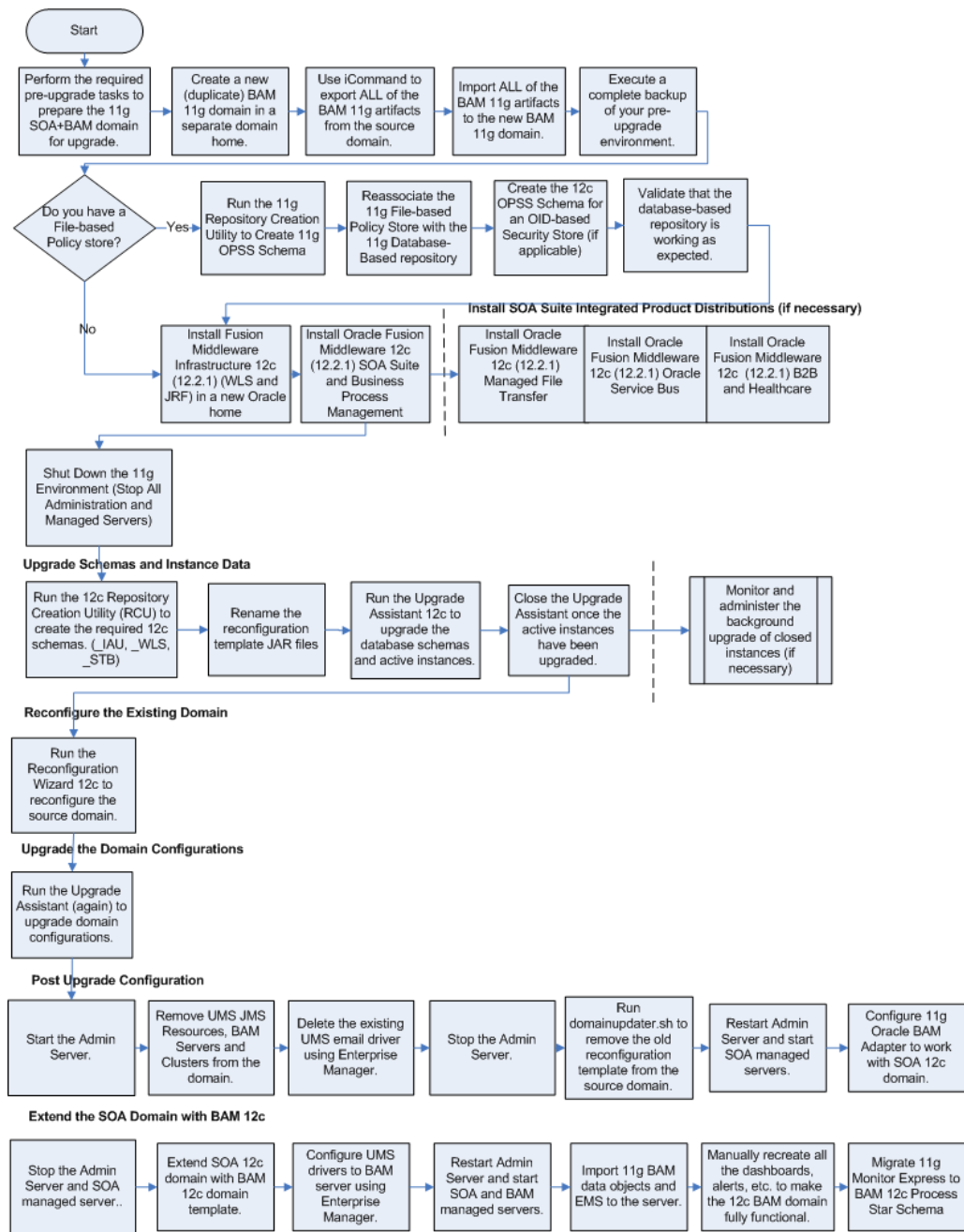
Oracle recommends that you continue to use your Oracle BAM 11g domain after the upgrade to allow time to create and test all of the necessary artifacts. Therefore, before you begin the SOA with Oracle BAM upgrade process, it is strongly recommended that you reinstall the Oracle BAM 11g domain in a separate location so that the source files remain untouched during the domain reconfiguration. You will configure SOA 12c to point to this new 11g domain after the upgrade as your existing 11g Oracle BAM domain will be altered and will not function with SOA 12c.

Note:

There is no upgrade support for an Oracle BAM-only domain (a domain without SOA). If you have a BAM-only domain, and want to upgrade to Oracle BAM 12c, then you must create a new Oracle BAM 12c domain and import data objects and recreate all the dashboards and alerts.

7.2 Understanding the SOA with Oracle BAM Upgrade Process Flow

The following flowchart shows a process overview of upgrading a SOA 11g domain with Oracle BAM to a SOA 12c domain with Oracle BAM 12c.



7.3 Performing the Pre-Upgrade Tasks for Oracle BAM

The tasks in this section should be performed when upgrading a SOA domain with Oracle BAM 11g to 12c.

Note:

If you are using a file-based policy store in your existing 11g environment, you must reassociate to database-based policy store before you begin the upgrade process. This is a standard pre-upgrade requirement and must be performed before you can upgrade BAM.

For more information, see the Oracle Fusion Middleware 12c Pre-Upgrade Checklist.

Make sure that you have already completed all of the applicable pre-upgrade tasks described in [Pre-Upgrade Tasks for SOA Suite and Business Process Management](#).

[Creating a New Oracle BAM 11g Domain Before You Upgrade](#)

[Exporting All Oracle BAM 11g Artifacts from the Existing Domain](#)

[Importing Oracle BAM 11g Artifacts into the New Oracle BAM 11g Domain](#)

[Creating a Complete Backup of the Oracle BAM 11g Domain](#)

7.3.1 Creating a New Oracle BAM 11g Domain Before You Upgrade

You will continue to use your existing Oracle BAM 11g domain after the upgrade, so you must install BAM 11g in a new domain home before you upgrade. If you do not create a new (separate) BAM 11g domain, you will not have a functioning BAM domain after the upgrade and you will lose many of your artifacts and configurations.

Note:

If you do not create separate domain for Oracle BAM 11g, then you will lose BAM artifacts and BAM-related configurations only (SOA artifacts will not be impacted).

In addition, any composites referring to BAM artifacts (such as adapters) or new instances will be faulted during runtime.

Use the installation instructions in the 11g version of the [Oracle Fusion Middleware Installation Guide for Oracle SOA Suite and Oracle Business Process Management Suite](#).

To preserve your existing 11g BAM environment, use the 11g ICommand to export ALL of your Oracle BAM 11g artifacts (not just DOs and EMS), and then import them into your new Oracle BAM 11g domain so you have a fully functional Oracle BAM 11g domain after the upgrade.

- [Exporting All Oracle BAM 11g Artifacts from the Existing Domain](#)
- [Importing Oracle BAM 11g Artifacts into the New Oracle BAM 11g Domain](#)

After the upgrade, you can continue using the Oracle BAM 11g domain. Alternatively, you can extend the 12c SOA domain with Oracle BAM 12c and export the DOs and EMS artifacts from 11g domain and import them into extended Oracle BAM 12c domain. For more information, see [Extending the SOA Domain with Oracle BAM 12c](#).

7.3.2 Exporting All Oracle BAM 11g Artifacts from the Existing Domain

After you install and configure your new Oracle BAM 11g domain in its new location, you will have to use 11g Oracle BAM ICommand utility to export the data from the existing (old) Oracle BAM 11g domain and then import it into the new Oracle BAM 11g domain before you upgrade.

For more information on using the 11g Oracle BAM ICommand command-line utility to export data files, see the "Export" section of *Monitoring Business Activity with Oracle BAM*.

7.3.3 Importing Oracle BAM 11g Artifacts into the New Oracle BAM 11g Domain

After you have created a complete export XML of your Oracle BAM 11g artifacts (not just the DOs and EMS), you must import the XML file into the newly created Oracle BAM 11g domain. This will ensure that you continue to have a fully functioning Oracle BAM domain after the upgrade and domain reconfiguration.

For more information on using the 11g Oracle BAM ICommand command-line utility to export data files, see the "Import" section of *Monitoring Business Activity with Oracle BAM*.

7.3.4 Creating a Complete Backup of the Oracle BAM 11g Domain

In the event that the upgrade fails, you will need to restore the entire pre-upgrade environment using a backup version. Make sure that you have created a backup version of the entire Oracle BAM 11g environment before you continue with the upgrade process. Note that the backup domain is separate from the new Oracle BAM 11g domain you created in [Creating a New Oracle BAM 11g Domain Before You Upgrade](#).

For more information, see "Backup and Recovery Strategies for Upgrade" in the *Oracle Fusion Middleware Planning an Upgrade of Oracle Fusion Middleware*.

7.4 Upgrading a SOA with Oracle BAM Domain to 12c

Use this procedure when upgrading a SOA domain that includes Oracle BAM 11g.

This section describes the process of upgrading a SOA 11g domain that includes Oracle BAM to a SOA 12c (12.2.1) domain that will also include Oracle BAM. Do not perform these tasks until you have created a complete backup of the Oracle BAM 11g domain.

[Installing the Fusion Middleware Infrastructure 12c \(12.2.1\) in a New Oracle Home Directory](#)

[Installing Oracle SOA Suite and Business Process Management 12c \(12.2.1\) in the 12.2.1 Oracle Home](#)

[Stopping Servers and Processes](#)

[Creating New 12c Schemas with the Repository Creation Utility \(RCU\)](#)

[Renaming the Oracle BAM Templates Before Upgrading the 11g Schemas](#)

[Running the Upgrade Assistant to Upgrade Schemas](#)

[Reconfiguring the 11g Domain with the Reconfiguration Wizard](#)

Running the Upgrade Assistant to Upgrade Component Configurations

7.4.1 Installing the Fusion Middleware Infrastructure 12c (12.2.1) in a New Oracle Home Directory

Create a new Oracle home for Infrastructure 12c (12.2.1) as described in [Installing WebLogic Server and JRF Infrastructure](#).

7.4.2 Installing Oracle SOA Suite and Business Process Management 12c (12.2.1) in the 12.2.1 Oracle Home

Add the latest SOA component binaries to the 12c (12.2.1) Oracle home as described in [Installing Oracle SOA Suite and Business Process Management 12c](#).

7.4.3 Stopping Servers and Processes

Stop all of the servers and processes that are currently running before you begin the upgrade.

Instructions for stopping an Oracle Fusion Middleware environment are provided in "Stopping an Oracle Fusion Middleware Environment" in *Administering Oracle Fusion Middleware*.

7.4.4 Creating New 12c Schemas with the Repository Creation Utility (RCU)

If this is your first 12c upgrade, you may need to create new schemas for SOA and Oracle BAM 12c (12.2.1). For the SOA with Oracle BAM upgrade you will need to create the following schemas (if you have not done so already):

Note: You do not have to create new schemas if you are upgrading from a previous 12c release unless you are extending your 12c domain to include components for which you have not yet created the required schemas.

- Service Table (_STB)
- Audit Services (_IAU)
- WebLogic Services (_WLS) - The Oracle WebLogic Services schema is required for Oracle BAM - though Oracle BAM does not have its own separate schema in 11g.
- Managed File Transfer (_MFT) This schema was introduced in Release 12c (12.1.3)
- Oracle Platform Security Services (_OPSS) This schema is required if you are using Oracle Internet Directory (OID)-based security store in 11g.

See [Creating the Required SOA Schemas Before You Upgrade from 11g](#) for more information on creating and preparing schemas for upgrade.

7.4.5 Renaming the Oracle BAM Templates Before Upgrading the 11g Schemas

Before upgrading the 11g schemas with the Upgrade Assistant, you must change the names of the following Oracle BAM reconfiguration templates upgrade will fail.

Make sure that you have exported your 11g Oracle BAM data before completing this step. If you are unsure, read [Exporting All Oracle BAM 11g Artifacts from the Existing Domain](#).

The templates can be found in the following 12c directory: `$ORACLE_HOME/soa/common/templates/wls`

Template Name	Rename To:
oracle.bam.reconfig_template_12.2.1.jar	oracle.bam.reconfig_template_12.2.1.jar.old
oracle.bam.reconfig_template_12.2.1.jar.rename	oracle.bam.reconfig_template_12.2.1.jar

7.4.6 Running the Upgrade Assistant to Upgrade Schemas

Follow the standard procedure for upgrading schemas using the Upgrade Assistant. For more information, see [Upgrading SOA Schemas with the Upgrade Assistant](#).

When upgrading SOA Suite and BPM with Oracle BAM 11g schemas, select the following options on the Available Components screen (the schema names are listed for each):

- Oracle Platform Security Services (`_OPSS`)
- Oracle SOA (`_SOAINFRA`)
- Oracle Managed File Transfer (`_MFT`)

When Oracle Platform Security Services and Oracle SOA are selected, the following dependencies are also selected:

- Oracle Audit Services (`_IAU`)
- Oracle Metadata Services (`_MDS`)
- User Messaging Service (`_ORASDPM`)

NOTE: The 11g `_ORASDPM` schema has been renamed to `_UMS` in 12c. However, you must provide the 11g schema name `prefix_ORASDPM` when prompted in the Upgrade Assistant. The schema will continue to be `<prefix>_ORASDPM` for upgraded domains since schema names cannot be changed by Upgrade Assistant.

7.4.7 Reconfiguring the 11g Domain with the Reconfiguration Wizard

After you have renamed the Oracle BAM reconfiguration templates, start the Reconfiguration Wizard and follow the steps as described [Reconfiguring the Domain Using the Reconfiguration Wizard](#).

The Reconfiguration Wizard will remove the Oracle BAM 11g application, library, `BAMDataSource`, `BAMJMSSserver` and `BAMJmsSystemResource` from the domain.

NOTE: You must manually remove the Oracle BAM server and cluster after the upgrade as described in [Removing the Oracle BAM Servers and Clusters from the Domain](#).

7.4.8 Running the Upgrade Assistant to Upgrade Component Configurations

After the domain reconfiguration, run the Upgrade Assistant (again) to upgrade any remaining component configurations.

For more information, see [Upgrading the Domain Component Configurations Using the Upgrade Assistant](#).

7.5 Performing Post Upgrade Configuration Tasks for Oracle SOA with Oracle BAM 12c

To run the SOA 12c domain that will eventually include Oracle BAM 12c, you must perform additional configuration tasks after the upgrade.

After a successful upgrade, you must perform the following tasks to run the SOA 12c domain that will eventually include Oracle BAM 12c.

Note:

Oracle recommends that you first run the 12c SOA environment with Oracle BAM 11g. Once you have verified that the environment is functioning as expected, you can extend the domain with Oracle BAM 12c as described in [Extending the SOA Domain with Oracle BAM 12c](#).

[Starting the Administration \(Admin\) Server](#)

[Launching the WebLogic Server Administration 12c Console](#)

Deleting the UMS JMS Resources Running on the Oracle BAM Server or Oracle BAM Cluster

These steps can be used to remove the UMS JMS resources for standalone or clustered environments. Note the additional steps needed for Oracle BAM cluster.

Deleting Subdeployment Resources Targeted to UMS JMS Server Targeted to Oracle BAM

Delete the subdeployment resources targeted to UMS JMS server targeted to Oracle BAM.

Removing the Oracle BAM Servers and Clusters from the Domain

While the Admin Server is running, use Weblogic Console to complete the following tasks.

Removing Unnecessary Oracle BAM 11g Files from the Upgraded Domain

Use the domainupdater script to remove any unnecessary 11g files from the upgraded domain.

For Cluster Upgrades Only: Stop the Admin and Managed Servers

If you are upgrading a cluster, you must stop the Admin and Managed Servers before you execute the pack and unpack commands.

For Cluster Upgrades Only: Run the Pack Command where the Admin Server and Managed Servers are Installed

To get the reconfigured domain, including NodeManager, onto the other node in the cluster, execute a managed pack from the Admin Server machine, and then unpack on the remote nodes.

For Cluster Upgrades Only: Run the Unpack Command to Replicate the Domain Configuration of SOAHOST1 on SOAHOST2.

Make sure that the Admin and Managed Servers are still stopped and then execute the following unpack command to create a full domain or a subset of a domain

Restarting the Admin Server

You must restart the 12c Administration Server before you execute the remaining configuration tasks.

Configuring 11g Oracle BAM Adapter to Work With SOA 12c Domain

Once the SOA 12c domain has been upgraded, you must configure the SOA 12c domain to use the Oracle BAM 11g domain

Restarting the SOA Managed Servers

You must restart the SOA managed servers to complete the post configuration tasks.

Deleting the Existing UMS Email Driver from the SOA Domain

Due to incompatibility issues with the mail patterns, you must delete the UMS driver in Oracle Enterprise Manager.

7.5.1 Starting the Administration (Admin) Server

To start the Oracle WebLogic Administration Server, use the following script:

```
(UNIX) DOMAIN_HOME/bin/startWebLogic.sh
```

```
(Windows) DOMAIN_HOME\bin\startWebLogic.cmd
```

7.5.2 Launching the WebLogic Server Administration 12c Console

To display the Administration Console:

1. Enter the following URL in a browser:

`http://hostname:port_number/console`

The port number is the port number of the Administration Server. By default, the port number is 7001.

The login page is displayed.

2. Log in using the user name and password supplied during installation or another administrative user that you created.

Alternatively, you can access the Administration Console from Fusion Middleware Control, from the home pages of targets such as the Administration Server or Managed Servers.

7.5.3 Deleting the UMS JMS Resources Running on the Oracle BAM Server or Oracle BAM Cluster

These steps can be used to remove the UMS JMS resources for standalone or clustered environments. Note the additional steps needed for Oracle BAM cluster.

1. Determine which JMS Server name is targeted to the Oracle BAM server or Oracle BAM cluster. You may have multiple JMS servers, and it is important to note which server is targeted to the Oracle BAM server or cluster before you continue. If you have only one UMS JMS Server, the default name is UMSJMSServer_auto_1. Always validate that the target of the selected UMS JMS Server is the Oracle BAM server or Oracle BAM cluster.

Navigate to the **Summary of JMS Servers** screen (shown below). From the Domain Structure menu, expand **Services**, select **Messaging** and then select **JMS Servers**. Locate the UMSJMSServer that is targeted to the Oracle BAM server.

In the example below, UMSJMSServer_auto_3 is the server targeted to the Oracle BAM server.

Summary of JMS Servers

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to them.
This page summarizes the JMS servers that have been created in the current WebLogic Server domain.

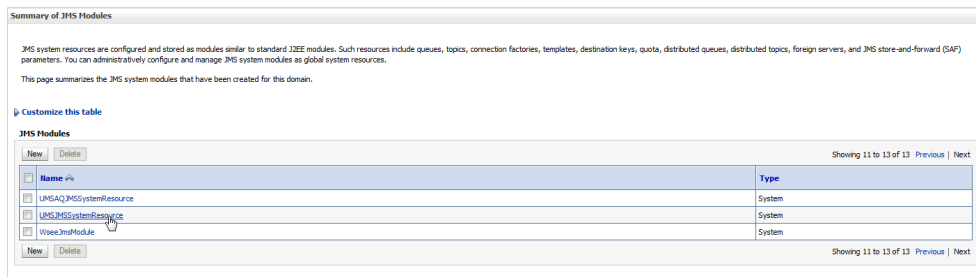
Customize this table

JMS Servers (Filtered - More Columns Exist)

Name	Persistent Store	Target	Current Target	Health
SOAJMServer_auto_2	SOAJMSFileStore_auto_2	soa_server2 (migratable)	soa_server2	OK
UMSJMServer_auto_1	UMSJMSFileStore_auto_1	soa_server1 (migratable)	soa_server1	OK
UMSJMServer_auto_2	UMSJMSFileStore_auto_2	soa_server2 (migratable)	soa_server2	OK
UMSJMServer_auto_3	UMSJMSFileStore_auto_3	bam_server1	bam_server1	
UMSJMServer_auto_4	UMSJMSFileStore_auto_4	osb_server1	osb_server1	
UMSJMServer_auto_5	UMSJMSFileStore_auto_5	ums_server1	ums_server1	
wlslJMServer	FileStore	osb_server1	osb_server1	
WiseeJMServer	WiseeFileStore	osb_server1	osb_server1	

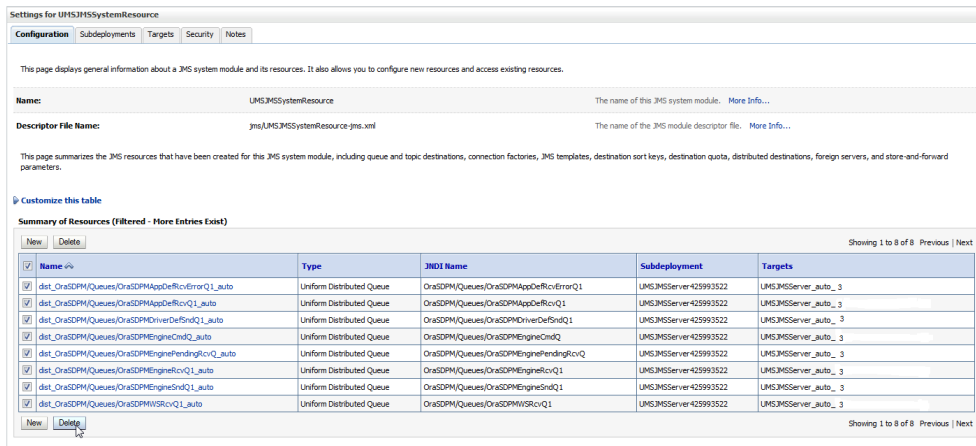
2. Delete the local queues for the UMS JMS Server targeted to Oracle BAM (UMSJMServer_auto_3 in this example).

Navigate to the **Summary of JMS Modules** screen (shown below). From the Domain Structure menu, expand **Services**, select **JMS Modules**. Locate **UMSJMSSystemResource** and click to display the local (and distributed) queues in the **Settings for UMSJMSSystemResource** screen. You can filter the results to show only those queues targeted to your UMS JMS Server.



- Oracle BAM Cluster Only:** Select all Uniform Distributed Queues targeted only to the Oracle BAM server or cluster (**UMSJMSServer_auto_3** in this example). (You can filter by type Uniform Distributed Queues). Click **Delete**.

CAUTION: Do not delete distributed queues that include server targets other than Oracle BAM. If there are other targeted servers, you must first remove (untarget) the Oracle BAM server from the distributed queue as shown in Step 4.



- Untarget the Oracle BAM server from the distributed queue (if necessary).

To untarget the Oracle BAM server from the distributed queue, click the **Targets** tab from the **Settings for UMSJMSSystemResource** screen. Remove the checkmark next to the Oracle BAM server and click **Save**. Now you can safely delete the distributed queues as described in Step 3.

Settings for UMSJMSSystemResource

Configuration Subdeployments **Targets** Security Notes

Use this page to select the server or cluster on which you would like to deploy this JMS system module. You can

Servers

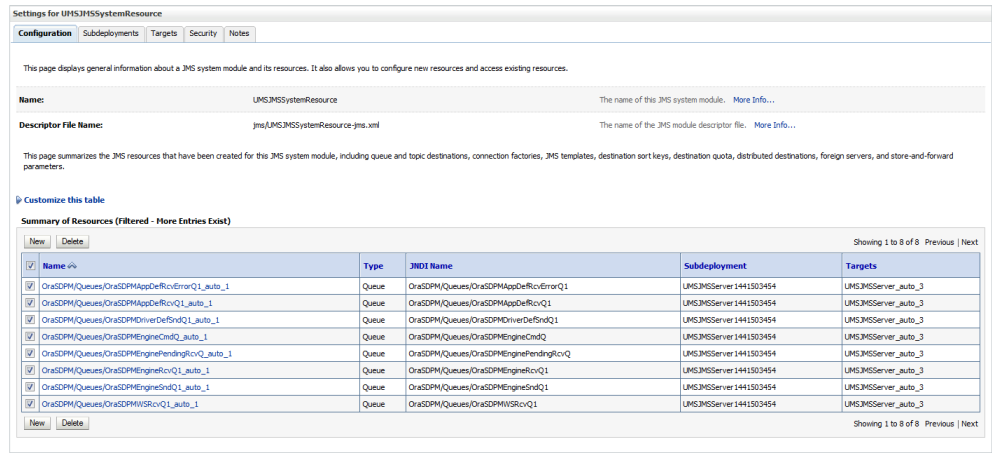
<input type="checkbox"/> AdminServer
<input checked="" type="checkbox"/> bam_server1
<input type="checkbox"/> ess_server1
<input type="checkbox"/> mft_server1
<input checked="" type="checkbox"/> osb_server1
<input checked="" type="checkbox"/> ums_server1

Clusters

<input checked="" type="checkbox"/> soa_cluster_1
<input checked="" type="radio"/> All servers in the cluster <input type="radio"/> Part of the cluster
<input type="checkbox"/> soa_server2
<input type="checkbox"/> soa_server1

5. Delete the local queues that are targeted to the UMS JMS Server.

Select all local queues that are targeted to the UMS JMS Server targeted to Oracle BAM (UMSJMSserver_auto_3) from the **Settings for UMSJMSSystemResource** screen (as shown below):



6. Click **Delete**.

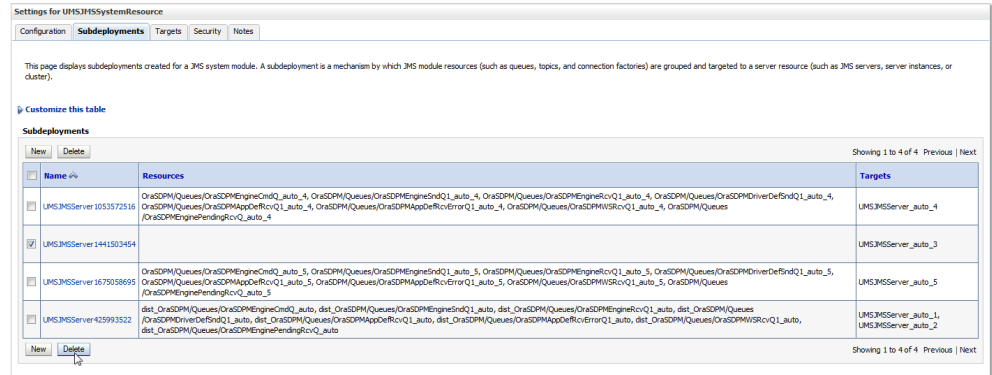
7.5.4 Deleting Subdeployment Resources Targeted to UMS JMS Server Targeted to Oracle BAM

Delete the subdeployment resources targeted to UMS JMS server targeted to Oracle BAM.

1. Delete the subdeployment resources from the UMS JMS Server.

From the **Settings for UMSJMSSystemResource** screen, click the **Subdeployments** tab.

2. Select the UMS JMS Server targeted to Oracle BAM (in the example below its UMSJMSServer_auto_3).



3. Click **Delete**.

7.5.5 Removing the Oracle BAM Servers and Clusters from the Domain

While the Admin Server is running, use Weblogic Console to complete the following tasks.

Note:

For more information on navigating through the Fusion Middleware Control Console, see *Getting Started with Administering Oracle SOA Suite and Oracle BPM Suite*.

1. Navigate to the **Summary of JMS Servers** screen (shown below). From the Domain Structure menu, expand **Services**, select **Messaging** and then select **JMS Servers**.
2. Select the `UMSJMSServer_auto_x` from the list. Make sure the Current Target is the Oracle BAM server.

Summary of JMS Servers

JMS servers act as management containers for the queues and topics in JMS modules that are targeted to them. This page summarizes the JMS servers that have been created in the current Weblogic Server domain.

Customize this table

JMS Servers (Filtered - More Columns Exist)

Name	Persistent Store	Target	Current Target	Health
SOAJMSServer_auto_2	SOAJMSFileStore_auto_2	soa_server2 (migratable)	soa_server2	OK
UMSJMSServer_auto_1	UMSJMSFileStore_auto_1	soa_server1 (migratable)	soa_server1	OK
UMSJMSServer_auto_2	UMSJMSFileStore_auto_2	soa_server2 (migratable)	soa_server2	OK
UMSJMSServer_auto_3	UMSJMSFileStore_auto_3	bam_server1	bam_server1	
UMSJMSServer_auto_4	UMSJMSFileStore_auto_4	osb_server1	osb_server1	
UMSJMSServer_auto_5	UMSJMSFileStore_auto_5	ums_server1	ums_server1	
wlbbJMSServer	FileStore	osb_server1	osb_server1	
WseeJMSServer	WseeFileStore	osb_server1	osb_server1	

3. Click **Delete**.
4. Navigate to the **Summary of Persisted Stores** screen (shown below).
5. Select `UMSJMSFileStore_auto_x` from the list. (Make sure the Target is the Oracle BAM server.)

Summary of Persisted Stores

A persistent store is a physical repository for storing subsystem data, such as persistent JMS messages. It can be a JDBC-accessible database, disk-based file, or replicated memory storage. This page summarizes the persistent stores that have been created for this domain.

Customize this table

Persisted Stores

Name	Type	Target
mds-soa	FileStore	AdminServer
MFTJMSFileStore	FileStore	mft_server1
SOAJMSFileStore_auto_1	FileStore	soa_server1 (migratable)
SOAJMSFileStore_auto_2	FileStore	soa_server2 (migratable)
UMSJMSFileStore_auto_1	FileStore	soa_server1 (migratable)
UMSJMSFileStore_auto_2	FileStore	soa_server2 (migratable)
UMSJMSFileStore_auto_3	FileStore	bam_server1
UMSJMSFileStore_auto_4	FileStore	osb_server1
UMSJMSFileStore_auto_5	FileStore	ums_server1
WseeFileStore	FileStore	osb_server1

6. Click **Delete**.
7. Navigate to the **Summary of Clusters** screen (shown below). From the Domain Structure menu, expand **Environment** and select **Clusters**.

8. Select `bam_cluster` from the list of clusters.

Summary of Clusters

This page summarizes the clusters that have been configured in the current WebLogic Server domain.

A cluster defines groups of WebLogic Server servers that work together to increase scalability and reliability.

[Customize this table](#)

Clusters (Filtered - More Columns Exist)

New | Clone | Delete Showing 1 to 2 of 2 Previous | Next

<input type="checkbox"/>	Name	Cluster Address	Cluster Messaging Mode	Migration Basis	Default Load Algorithm	Replication Type	Cluster Broadcast Channel	Servers
<input checked="" type="checkbox"/>	bam_cluster		Unicast	Database	Round Robin	(None)		bam_server1, bam_server2
<input type="checkbox"/>	soa_cluster		Unicast	Database	Round Robin	(None)		soa_server1, soa_server2

New | Clone | Delete Showing 1 to 2 of 2 Previous | Next

9. Click **Delete**.

10. Navigate to the **Summary of Servers** screen (shown below). From the Domain Structure menu, expand **Environment** and select **Servers**.

11. Select the Oracle BAM server(s) from the list.

Summary of Servers

Configuration | Control

A server is an instance of WebLogic Server that runs in its own Java Virtual Machine (JVM) and has its own configuration.

This page summarizes each server that has been configured in the current WebLogic Server domain.

[Customize this table](#)

Servers (Filtered - More Columns Exist)

New | Clone | Delete Showing 1 to 5 of 5 Previous | Next

<input type="checkbox"/>	Name	Type	Cluster	Machine	State	Health	Listen Port
<input type="checkbox"/>	AdminServer(admin)	Configured		LocalMachine	RUNNING	OK	7001
<input checked="" type="checkbox"/>	bam_server1	Configured		LocalMachine	SHUTDOWN	Not reachable	9001
<input checked="" type="checkbox"/>	bam_server2	Configured		LocalMachine	SHUTDOWN	Not reachable	9003
<input type="checkbox"/>	soa_server1	Configured	soa_cluster	LocalMachine	SHUTDOWN	Not reachable	8001
<input type="checkbox"/>	soa_server2	Configured	soa_cluster	LocalMachine	SHUTDOWN	Not reachable	8003

New | Clone | Delete Showing 1 to 5 of 5 Previous | Next

12. Click **Delete**.

7.5.6 Removing Unnecessary Oracle BAM 11g Files from the Upgraded Domain

Use the `domainupdater` script to remove any unnecessary 11g files from the upgraded domain.

1. Stop the 12c Admin Server:

```
DOMAIN_HOME/bin/stopWebLogic.sh
username password [admin_url]
```

2. Run the `domainupdater` script from the SOA 12c home to remove any unnecessary legacy 11g files from the upgraded domain.

```
(UNIX) cd ORACLE_HOME/soa/bam/bin
./domainupdater.sh
```

```
Enter the 11g domain path: (ex:)/soa11g/user_projects/domains/soa_domain

(Windows) cd ORACLE_HOME\soa\bam\bin
domainupdater.cmd
Enter the 11g domain path: (ex:)\soa11g\user_projects\domains\soa_domain
```

3. Restart the 12c Admin Server.

```
(UNIX) DOMAIN_HOME/bin/startWebLogic.sh

(Windows) DOMAIN_HOME\bin\startWebLogic.cmd
```

7.5.7 For Cluster Upgrades Only: Stop the Admin and Managed Servers

If you are upgrading a cluster, you must stop the Admin and Managed Servers before you execute the pack and unpack commands.

To stop the WebLogic Server:

```
DOMAIN_HOME/bin/stopWebLogic.sh
username password [admin_url]
```

To stop the SOA server:

```
(UNIX) DOMAIN_HOME/bin/stopManagedWebLogic.sh
soa_server_name admin_url
(Windows) DOMAIN_HOME\bin\stopManagedWebLogic.cmd
soa_server_name admin_url
```

See [Starting and Stopping Servers](#) for information on stopping servers in the correct order.

7.5.8 For Cluster Upgrades Only: Run the Pack Command where the Admin Server and Managed Servers are Installed

To get the reconfigured domain, including NodeManager, onto the other node in the cluster, execute a managed pack from the Admin Server machine, and then unpack on the remote nodes.

The pack command creates a template archive (.jar) file that contains a snapshot of either an entire domain or a subset of a domain. You can use a template that contains a subset of a domain to create a Managed Server domain directory hierarchy on a remote machine.

NOTE: The pack and unpack command utility must be run from 12c install directory pointing to the upgraded 11g domain.

Execute the pack command on the server where the Admin Server and one of the Managed Servers is installed.

In our example, you would execute the following on SOAHOST1:

```
cd /12c_ORACLE_HOME/oracle_common/common/bin
./pack.sh -domain=/11g_DOMAIN_HOME -
template=domainupgradetemplate.jar -
template_name=domainupgradetemplate -managed=true
```

In this example:

- `12c_ORACLE_HOME` refers the actual path to the 12c Oracle Home directory (the installation directory for the 12.2.1 bits).

- Replace `11g_DOMAIN_HOME` with the actual path to the upgraded domain directory.
- `domainupgradetemplate.jar` is a sample name for the jar file you are creating, which will contain the domain configuration files.
- `domainupgradetemplate` is the name assigned to the domain template file.
- By default, the `domainupgradetemplate` is created in the current directory where you ran the pack command. In this example, it would be created in the following directory, but you can specify a full path for the template jar file as part of the `-template` argument to the pack command:

```
ORACLE_COMMON_HOME/common/bin/
```

The pack command creates a template archive (.jar) file that contains a snapshot of either an entire domain or a subset of a domain. You can use a template that contains a subset of a domain to create a Managed Server domain directory hierarchy on a remote machine.

For more information on using the pack command, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

7.5.9 For Cluster Upgrades Only: Run the Unpack Command to Replicate the Domain Configuration of SOAHOST1 on SOAHOST2.

Make sure that the Admin and Managed Servers are still stopped and then execute the following unpack command to create a full domain or a subset of a domain

You can create a full domain or a subset of a domain used for a Managed Server domain directory on the remote machine. You may use unpack only with a template compatible with your current installation.

A sample unpack command code snippet is shown below. **Use this as an example only.** Note that you must specify the "`-overwrite_domain=true`" flag on unpack.

For more information on using the pack command, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

```
cd /12c_ORACLE_HOME/oracle_common/common/bin
./unpack.sh -template=domainupgradetemplate.jar -
domain=11g_DOMAIN_HOME -overwrite_domain=true
```

In this example:

- `12c_ORACLE_HOME` refers the actual path to the 12c Oracle Home directory (the installation directory for the 12.2.1 bits).
- Replace `11g_DOMAIN_HOME` with the actual path to the upgraded domain directory.
- `domainupgradetemplate.jar` is a sample name for the jar file you are creating, which will contain the domain configuration files.
- `domainupgradetemplate` is the name assigned to the domain template file.

7.5.10 Restarting the Admin Server

You must restart the 12c Administration Server before you execute the remaining configuration tasks.

Procedures for starting and stopping Oracle Fusion Middleware, including the Administration Server, Managed Servers, and components are provided in [Starting and Stopping Oracle Fusion Middleware](#).

7.5.11 Configuring 11g Oracle BAM Adapter to Work With SOA 12c Domain

Once the SOA 12c domain has been upgraded, you must configure the SOA 12c domain to use the Oracle BAM 11g domain

Make to use the Oracle BAM 11g domain you created in [Creating a New Oracle BAM 11g Domain Before You Upgrade](#).

For more information on how to configure this setup, see "[Configuring Oracle BAM Adapter](#)" in the 11g version of the *Oracle Fusion Middleware Administrator's Guide for Oracle SOA Suite and Oracle Business Process Management Suite*.

7.5.12 Restarting the SOA Managed Servers

You must restart the SOA managed servers to complete the post configuration tasks.

To start the SOA server:

```
(UNIX) DOMAIN_HOME/bin/startManagedWebLogic.sh
      soa_server_name admin_url
(Windows) DOMAIN_HOME\bin\startManagedWebLogic.cmd
      soa_server_name admin_url
```

See [Starting and Stopping Servers](#) for information on stopping servers in the correct order.

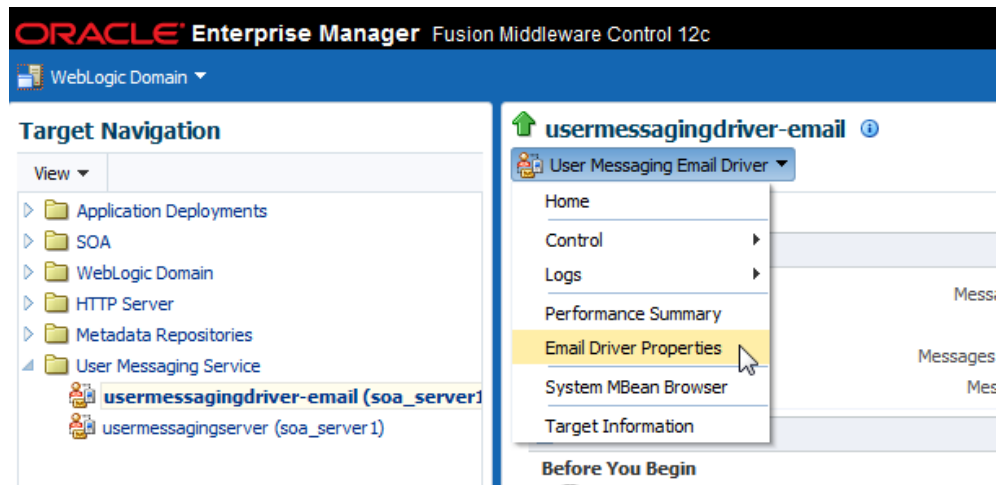
7.5.13 Deleting the Existing UMS Email Driver from the SOA Domain

Due to incompatibility issues with the mail patterns, you must delete the UMS driver in Oracle Enterprise Manager.

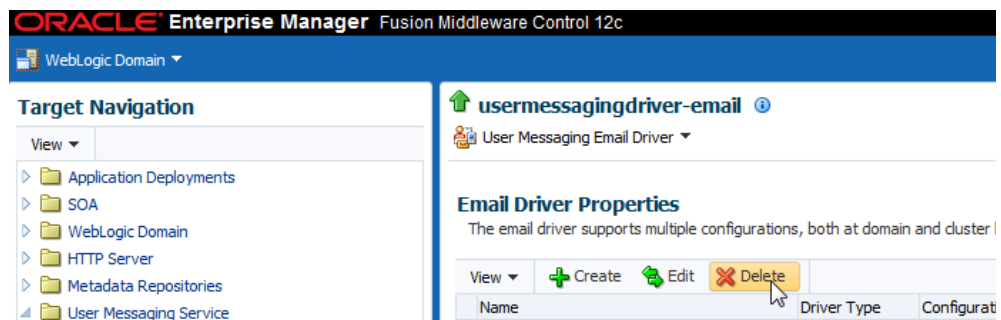
Note that you will create a new driver after you have extended the SOA 12c domain with the Oracle BAM 12c templates.

1. While the Admin Server and all the managed servers are running in the SOA domain, navigate to **User Messaging Service**, select the `usermessagingdriver-mail` service targeted to the `soa_server`.

From the User Messaging Email Driver drop-down menu, select **Email Driver Properties** as shown below.



2. Select the User Messaging Service Email driver name from the Target Navigation pane.



3. Click **Delete**.
4. Repeat the process for any other cluster present in the domain.

7.6 Extending the SOA Domain with Oracle BAM 12c

When you are ready to use Oracle BAM 12c with your upgraded SOA 12c environment, you must extend the domain to include the BAM 12c templates.

Complete the following tasks. Note that some tasks are optional.

[Stop the Admin Server and SOA Managed Server\(s\)](#)

[Extend the SOA 12c Domain with Oracle BAM 12c Domain Template](#)

[Create the New UMS Email Driver for the Oracle BAM Server](#)

[Import the Oracle BAM 11g data objects and EMS data to the BAM 12c server.](#)

[Manually recreate the 11g BAM dashboards, alerts, and other artifacts for use in the BAM 12c domain.](#)

[Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\).](#)

[Migrate the 11g Monitor Express data to BAM 12c Process Star schema. \(Optional\)](#)

[Task 8: Generating 11g Compatible Process Star Schema Data Views in 12c \(Optional\)](#)

7.6.1 Stop the Admin Server and SOA Managed Server(s)

Stop all of the 12c servers and processes that are currently running before you begin extending the domain.

To stop the WebLogic Server:

```
DOMAIN_HOME/bin/stopWebLogic.sh
    username password [admin_url]
```

To stop the SOA server:

```
(UNIX) DOMAIN_HOME/bin/stopManagedWebLogic.sh
    soa_server_name admin_url
(Windows) DOMAIN_HOME\bin\stopManagedWebLogic.cmd
    soa_server_name admin_url
```

See [Starting and Stopping Servers](#) for information on stopping servers in the correct order.

7.6.2 Extend the SOA 12c Domain with Oracle BAM 12c Domain Template

Use the Configuration Wizard to extend the existing SOA domain with Oracle BAM 12c.

1. Launch the Configuration Wizard.

```
(UNIX) ORACLE_HOME/oracle_common/common/bin
./config.sh
```

```
(Windows) ORACLE_HOME\oracle_common\common\bin
config.cmd
```

2. Select **Extend Existing Domain** when prompted:



3. Select the following templates on the Templates screen:

- Oracle WSM Policy Manager - 12.2.1.0
- Oracle User Messaging Service - 12.2.1.0
- Oracle BAM Client - 12.2.1.0

- Oracle Enterprise Manager Plugin for BAM - 12.2.1.0
4. Complete the remaining Configuration Wizard screens as described in "Configuring the Oracle SOA Suite and Business Activity Monitoring (BAM) Topology" in *Installing and Configuring Oracle SOA Suite and Business Process Management*.

Note:

Certain Fusing Middleware components such as SOA, OSB and BAM have a dependency on UMS in 12c. If you configure more than one of these components within a single 12.2.1 domain, then **each of these components must run within its own cluster** — even if there is only one server that runs that component. See [Figure 6-1](#) in [Upgrading a Clustered SOA Environment](#).

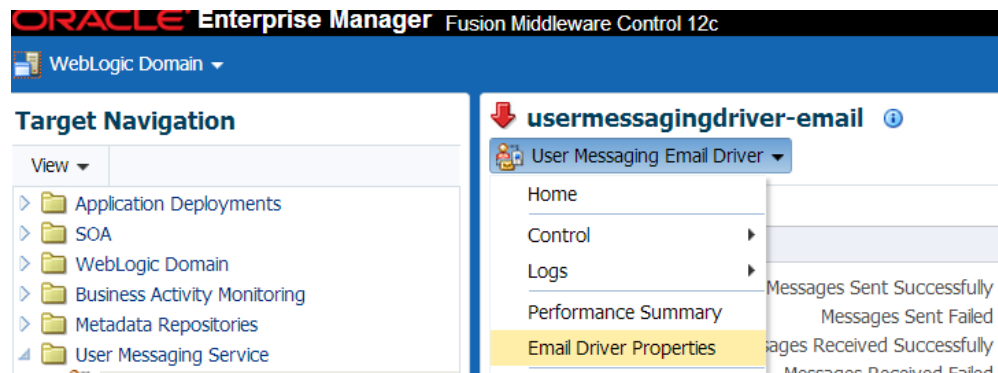
When you reach the **Advanced Configuration** screen of the Configuration Wizard, select **Managed Servers, Clusters, and Coherence** to create a BAM cluster as described in "Clusters" in *Creating WebLogic Domains Using the Configuration Wizard*.

7.6.3 Create the New UMS Email Driver for the Oracle BAM Server

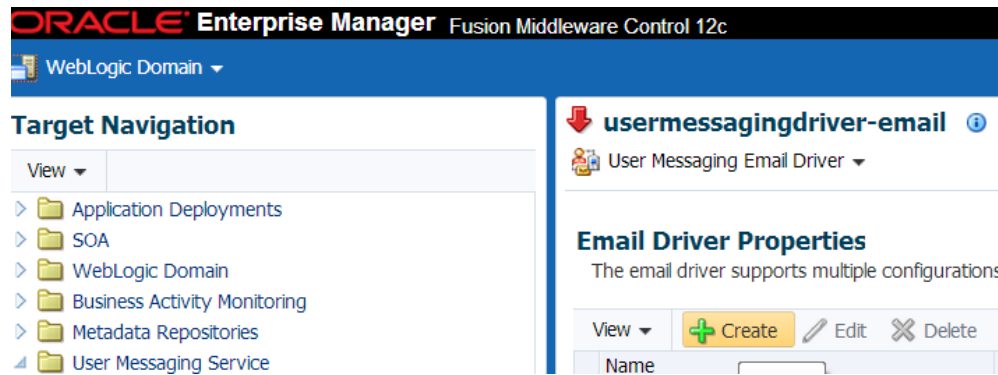
While the Oracle BAM server is running in the cluster, use Fusion Middleware Control Console to complete the following tasks:

1. Navigate to the **Email Driver Properties** screen.

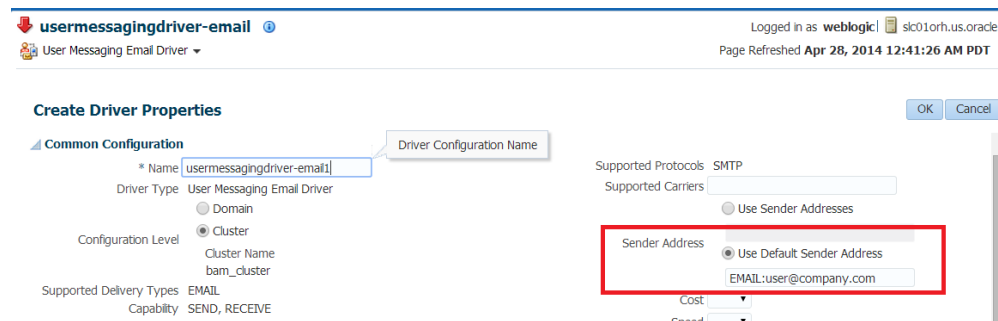
From the Target Navigation pane, select **User Messaging Service** and from the User Messaging Email Driver drop-down menu, select **Email Driver Properties** (as shown below).



2. Click **Create** to add a new UMS Email driver.



3. Provide a unique name for the new Email driver in the **Name** field as shown below. Note that UMS needs to be configured on each cluster in a 12c domain. Therefore maintain the default selection for **Configuration Level** as Cluster as shown in the image.



4. Select **Use Default Sender Address** and enter EMAIL:emailid@company.com. Note that the EMAIL: prefix is mandatory in this field.
5. Click **OK** to create the new driver with the given properties.

7.6.4 Import the Oracle BAM 11g data objects and EMS data to the BAM 12c server.

Once you have extended the domain to include BAM 12c, you must export the data objects and EMS data from the BAM 11g environment you have been using with SOA 12c. You will then import this data to the SOA with BAM 12c environment.

1. Export the data objects and EMS data from the 11g BAM domain using the ICommand command-line utility. (Note that the EMS definitions were upgraded as part of the standard upgrade process and do not need to be imported.)

The following example shows how to use ICommand 11g to **export** information about one or more objects in the Oracle BAM server to a XML file:

```
$11g_ORACLE_HOME/soa/bam/bin/icommand -cmd export -name "/Samples/Call Center" -type dataobject -file C:\CallCenter.xml
```

NOTE: You may need to modify the ICommand configuration file before you run the script. Specifically, verify that the correct usernames and passwords have been entered. The BAMICommandConfig.xml file is located in WLS_HOME/user_projects/domains/base_domain/config/fmwconfig/servers/bam_server1/applications/oracle-bam_11.1.1/config/.

The following is an example configuration file.

```

<host>www.example.com</host>
<port>7001</port>
<username>weblogic</username>
<password>welcome1</password>
<dbusername>SOAINFRA</dbusername>
<dbpassword>welcome1</dbpassword>
<dburl>jdbc:oracle:thin:@localhost:1521:orcl</dburl>

```

2. Import the XML file (created in the previous step) using the 12c BAMCommand command-line utility.

The following example shows how to use 12c BAMCommand to **import** the information:

```

$12c_ORACLE_HOME/soa/bam/bin/bamcommand -cmd import -file
BPELOrderBookingDataObject.xml -upgrade 1 -username weblogic -port 7001 -host
server.yourcompany.com

```

Note:

When you use the `import` command with the `-upgrade` parameter to bring Oracle BAM 11g artifacts into Oracle BAM 12c, some information is modified.

7.6.5 Manually recreate the 11g BAM dashboards, alerts, and other artifacts for use in the BAM 12c domain.

The dashboards, alerts, views, etc. you used in your BAM 11g domain must be recreated for the BAM 12c domain.

See the following sections of the BAM user guide, *Monitoring Business Activity with Oracle BAM*:

- Creating Dashboards
- Creating Alerts
- Creating Parameters
- Creating and Using Business Views

7.6.6 Migrate 11g Process Cubes to BAM 12c Process Star Schema (BPM Users Only).

Oracle strongly recommends that you perform the process cubes migration after extending an upgraded BPM 12c domain with BAM 12c. This migration will ensure that all of the necessary 12c data objects are created for BPM entities. This will also ensure the BPM process analytics data has been migrated from the 11g Process cubes (applicable only if cube tables are populated with run-time data).

While exporting and importing each archive, you will be required to provide the server administrator (admin) username and password, as well as the SOAINFRA schema username and password.

Note:

The process cubes migration is a required prerequisite before proceeding with the Monitor Express migration described in [Migrate the 11g Monitor Express data to BAM 12c Process Star schema. \(Optional\)](#).

This step is required even if you did not use Oracle BAM 11g Monitor Express with BPM 11g.

Task 1: Disable the Process Metrics.

Task 2: Determining the exportType to be used for the migration.

Task 3: (UNIX Only) Run migrateBPMProcessCubes script from the 12c SOA home.

Task 4: (Windows Only) Export data object definitions and data from 11g BPM Process Cubes and then import them to 12c.

Task 5: (Windows Only) Import dimension data (DimensionExport.zip) into the BAM server.

Task 6: (Windows Only) Import active fact data (ActiveFactDataExport.zip) into the BAM server.

Task 7: (Windows Only - if exportType=ALL) Import completed fact data (CompletedFactDataExport.zip) into the BAM server.

Task 8: Restart the Oracle BAM server once the migration has completed successfully.

Task 9: Enable the process metrics while the Oracle BAM server is running.

7.6.6.1 Task 1: Disable the Process Metrics.

1. Log in to the Fusion Middleware Control console.
2. In the Target Navigation pane, expand the Weblogic Domain node.
3. Select the domain in which Oracle SOA 12c server is installed.
For example, the domain might be `soainfra` or `base_domain`.
4. Right-click on the domain and select **System MBean Browser**.
The System MBean Browser page appears.
5. In the System MBean Browser, expand the Application Defined MBeans node.
6. Under Application Defined MBeans, expand the `oracle.as.soainfra.config` node.
7. Under `oracle.as.soainfra.config`, expand the Server: `server_name` node.
8. Under Server: `server_name`, expand the **AnalyticsConfig** node.
9. Under **AnalyticsConfig**, click **analytics**.

The analytics attributes are listed.

10. If not already set to `true`, change the value of the `DisableProcessMetrics` attribute to `true`.

11. Click **Apply**.

7.6.6.2 Task 2: Determining the `exportType` to be used for the migration.

The `exportType` must be decided before migration because once the active instance migration is complete, and process analytics are enabled, you will not be able to go back and migrate the Completed instance data.

The valid `exportType` values are:

- `INFLIGHT_WITH_DIMENSION_AND_DEFINITION` (default): Migrates only Active instance fact data archives
- `ALL`: Migrates all Active and Completed instance fact data archives

7.6.6.3 Task 3: (UNIX Only) Run `migrateBPMPProcessCubes` script from the 12c SOA home.

The `migrateBPMPProcessCubes` shell script performs migration in two phases: export and import. The first phase exports the following archives from BPM Process Cubes, and then the second phase imports them to BAM 12c.

- `DefinitionExport.zip`
- `DimensionExport.zip`
- `ActiveFactDataExport.zip`
- `CompletedFactDataExport.zip` (if running with `-exportType = ALL` option)

Before running the `migrateBPMPProcessCubes` script, you must set the following environment variables:

Environment Variable	Description	Sample Location
<code>JAVA_HOME</code>	The location where you install the supported Java Development Kit (JDK).	<code>/u01/oracle/products/jdk_version</code>
<code>ORACLE_HOME</code>	The Oracle home that is created for all the Oracle Fusion Middleware products on a host computer. This read-only directory contains binary and library files, the Oracle Common home directory, and the individual product directories for each Oracle Fusion Middleware product you install. NOTE: This was known at the Middleware Home in 11g.	<code>/install_location/Oracle_Home</code>

Environment Variable	Description	Sample Location
PROD_DIR	The directory within the Oracle home, which contains the binary files associated with a logical product or feature set. The name of each product directory within the Oracle home is predefined by the installer and cannot be changed.	install_location/ Oracle_Home/SOA

On UNIX Operating Systems:

```
cd $ORACLE_HOME/bam/bin
./migrateBPMPProcessCubes.sh -serverUrl <BAM 12c server url> -serverPort <BAM 12c
server port> -serverUserName <BAM 12c server user> -dbUrl <soa db jdbc url> -
dbUserName <soainfra schema username> -exportDir <export dir> [-exportType ALL] [-
importOnly]
```

Where:

```
serverUrl      (mandatory) : BAM 12c Server URL
serverPort     (mandatory) : BAM 12c Server Port
serverUserName (mandatory) : BAM 12c Server admin user
dbUrl          (mandatory) : SOA DB jdbc URL
dbUserName     (mandatory) : SOAINFRA schema username
exportDir      (mandatory) : A writable Directory where exported archives will be
written
exportType     (optional ) : Export Type. Valid values are
                        a) INFLIGHT_WITH_DIMENSION_AND_DEFINITION (default):
Migrates only Active instance fact data archives
                        b) ALL :
Migrates all Active and Completed instance fact data archives
importOnly     (optional ) : If specified, data object definition and data archive
export phase is skipped and only import is performed. It is assumed that archives
are already present under "exportDir"
```

Note:

If there were errors during the migration, you may need to manually correct the issues and start the script again. For more information, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

7.6.6.4 Task 4: (Windows Only) Export data object definitions and data from 11g BPM Process Cubes and then import them to 12c.

The data object definitions migration is performed in two steps. Step one involves exporting the data from 11g process cubes and step 2 imports the data into 12c.

The first phase exports the following archives from BPM Process Cubes, and then the second phase imports them to BAM 12c. The export command shown below will generate the following archive files under the <exportDir> directory:

- DefinitionExport.zip
- DimensionExport.zip

- ActiveFactDataExport.zip
 - CompletedFactDataExport.zip (if running with `-exportType = ALL` option)
1. Export the data objects and definitions using the following code example: (make sure that you provide your actual directory names)

```
java -cp

%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.interface.jar;
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.model.jar;
%ORACLE_HOME%\oracle_common\modules\oracle.jdbc_12.1.0\ojdbc6.jar;
%ORACLE_HOME%\bam\modules\oracle.bam.client\bam-client.jar;%ORACLEHOME%\bam\lib
\bam-schema.jar;
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.dataobject.jar;
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.hwfanalytics.dataobject.jar

oracle.bpm.metrics.dataobject.migration.application.MigratellgProcessCubestol2cDO
-url <soa db jdbc url> -userName <soa schema user name> -exportDir <export
directory path> [-exportType ALL]
```

2. Import the data object definitions(DefinitionExport.zip) into the BAM server.

```
cd %ORACLE_HOME%\bam\bin\

bamcommand.cmd -host <bam server host> -protocol t3 -port <bam server port> -
username <bam server admin user> -dburl <bam database jdbc url>
-dbusername <bam database db user> -cmd import -file <Path to
DefinitionExport.zip> -mode update
```

NOTE: After importing the archive for BAM 12c, review the `bamcommand.log.*` files under `ORACLE_HOME/bam/bin` directory to make sure no errors occurred. If error conditions do exist, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

7.6.6.5 Task 5: (Windows Only) Import dimension data (DimensionExport.zip) into the BAM server.

This command uses `-datamode` and `-migrate` parameters.

Use the following code example to import the dimension data:

```
cd %ORACLE_HOME%\bam\bin\

bamcommand.cmd -host <bam server host> -protocol t3 -port <bam server port> -
username <bam server admin user> -dburl <bam database jdbc url>
-dbusername <bam database db user> -cmd import -file <Path to
DimensionExport.zip> -datamode update -migrate 1
```

NOTE: After importing the archive for BAM 12c, review the `bamcommand.log.*` files under `ORACLE_HOME/bam/bin` directory to make sure no errors occurred. If error conditions do exist, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

7.6.6.6 Task 6: (Windows Only) Import active fact data (ActiveFactDataExport.zip) into the BAM server.

This command uses `-datamode` and `-migrate` parameters.

```
cd %ORACLE_HOME%\bam\bin\

bamcommand.cmd -host <bam server host> -protocol t3 -port <bam server port> -
username <bam server admin user> -dburl <bam database jdbc url>
-dbusername <bam database db user> -cmd import -file <Path to
ActiveFactDataExport.zip> -datamode update -migrate 1
```

7.6.6.7 Task 7: (Windows Only - if exportType=ALL) Import completed fact data (CompletedFactDataExport.zip) into the BAM server.

This command uses `-datamode` and `-migrate` parameters.

Use this command only if you used the `exportType ALL` when you migrated the data objects definitions for the BAM 11g process cubes.

```
cd %ORACLE_HOME%\bam\bin\

run the following command
bamcommand.cmd -host <bam server host> -protocol t3 -port <bam server port> -
username <bam server admin user> -dburl <bam database jdbc url>
-dbusername <bam database db user> -cmd import -file <Path to
ActiveFactDataExport.zip> -datamode update -migrate 1
```

NOTE: After importing the archive for BAM 12c, review the `bamcommand.log.*` files under `ORACLE_HOME/bam/bin` directory to make sure no errors occurred. If error conditions do exist, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

7.6.6.8 Task 8: Restart the Oracle BAM server once the migration has completed successfully.

```
(UNIX) DOMAIN_HOME/bin/startManagedWebLogic.sh
      bam_server_name admin_url
```

```
(Windows) DOMAIN_HOME\bin\startManagedWebLogic.cmd
          bam_server_name admin_url
```

When prompted, enter your user name and password.

7.6.6.9 Task 9: Enable the process metrics while the Oracle BAM server is running.

1. Log in to the Fusion Middleware Control console.
2. In the Target Navigation pane, expand the Weblogic Domain node.
3. Select the domain in which the Oracle BAM server is installed.
For example, the domain might be `soainfra` or `base_domain`.
4. Right-click on the domain and select **System MBean Browser**.

The System MBean Browser page appears.

5. In the System MBean Browser, expand the Application Defined MBeans node.
6. Under Application Defined MBeans, expand the oracle.as.soainfra.config node.
7. Under oracle.as.soainfra.config, expand the Server: server_name node.
8. Under Server: server_name, expand the **AnalyticsConfig** node.
9. Under **AnalyticsConfig**, click **analytics**.
The analytics attributes are listed.
10. Change the value of the DisableProcessMetrics attribute to **false**.
11. Click **Apply**.

7.6.7 Migrate the 11g Monitor Express data to BAM 12c Process Star schema. (Optional)

Prerequisite: Perform the steps in [Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\)](#).

Complete this optional task only if you want to be able to analyze historical data from BAM 11g through the BAM 12c process analytics dashboards. To do this, you must migrate the 11g process analytics data from BAM 11g the Monitor Express data objects to the BAM 12c Process star schema data objects.

Before you can upgrade the 11g Monitor Express data to BAM 12c Process Star schema, you must migrate 11g process cubes to the BAM 12c star schema to ensure that all of the necessary 12c data objects are created for BPM entities. This will also ensure the BPM process analytics data has been migrated from the 11g Process cubes (applicable only if cube tables are populated with run-time data).

Note:

If there are any errors while importing the archive files, you can roll back all of the imported data in the BAM 12c process star schema data objects by running the rollback SQL file.

From a BAM 12c database SQL prompt, log in as the SOAINFRA schema user, navigate to the <PATH> directory and execute the following command:

```
sql> @rollbackMonitorExpressMigration.sql
```

For additional error handling procedures, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

[Disable the Process Metrics.](#)

[Run the Oracle BAM migration utility to migrate the Monitor Express data.](#)

[Import the BPM data to Oracle BAM 12c.](#)

[Enable publishing to BAM 12c.](#)

7.6.7.1 Disable the Process Metrics.

1. Log in to the Fusion Middleware Control console.
2. In the Target Navigation pane, expand the Weblogic Domain node.

3. Select the domain in which the Oracle BAM server is installed.
For example, the domain might be `soainfra` or `base_domain`.
4. Right-click on the domain and select **System MBean Browser**.
The System MBean Browser page appears.
5. In the System MBean Browser, expand the Application Defined MBeans node.
6. Under Application Defined MBeans, expand the `oracle.as.soainfra.config` node.
7. Under `oracle.as.soainfra.config`, expand the `Server: server_name` node.
8. Under `Server: server_name`, expand the **AnalyticsConfig** node.
9. Under **AnalyticsConfig**, click **analytics**.
The analytics attributes are listed.
10. Change the value of the `DisableProcessMetrics` attribute to **true**.
11. Click **Apply**.

7.6.7.2 Run the Oracle BAM migration utility to migrate the Monitor Express data.

Data objects and data object definitions were migrated in [Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\)](#).

The following command will generate the data export for BPM data in zipped CSV files:

```
java -cp
$DOMAIN_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.analytics.metrics.interface.jar:
$ORACLE_HOME/oracle_common/modules/oracle.jdbc_12.1.0/ojdbc6.jar:
$ORACLE_HOME/bam/modules/oracle.bam.client/bam-client.jar:
$ORACLE_HOME/bam/lib/bam-schema.jar:
$ORACLE_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.analytics.metrics.dataobject.jar:
$ORACLE_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.hwfanalytics.dataobject.jar:
$ORACLE_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.analytics.metrics.model.jar
oracle.bpm.metrics.dataobject.migration.application.Migrate11gBAMBPMTo12cDO
PropertyFiles
```

This command will generate "FactDataExport.zip" file under `<PATH>` directory.

NOTE: You can specify the composite name in the property file. If a composite name is specified, then data for only those composites will be migrated. If a composite name is not defined in the property file, then all the composite data will be migrated.

```
#####
#Mandatory Fields
#####
#11g User Name
BAM_11g_USER_NAME= <<11gUserName>>
#12c User Name
BAM_12c_SOURCE_NAME = <<12cUserName>>

#11g URL
```

```

BAM_11g_URL=jdbc:oracle:thin:@<<11gBAMSchemaDatabaseIP>>:<<Port>>:<<SID>>
#12c URL
BAM_12c_URL=jdbc:oracle:thin:@<<12cDatabaseIP>>:<<Port>>:<<SID>>

#Path where data to be exported
PATH = <<Path where data need to be exported>>
#*****
#Optional Fields
#*****

COMPOSITE_LIST = <<List of Composite for which data needs to be exported. This is
':' seperated>>
#If above mention configurable is missing then all the composite data will be
migrated.
DATAOBJECT_FOLDER_PATH = <<DataObject Path If this field is absent then default path
will taken as Samples/Monitor Express/BI_>>
#*****

```

7.6.7.3 Import the BPM data to Oracle BAM 12c.

This step will ensure that the previously exported BPM Monitor Express data is imported to BAM 12c.

```

cd $DOMAIN_HOME/bam/bin

./bamcommand -host <<host>> -protocol t3 -dbusername <<DbUserName>> -dburl
jdbc:oracle:thin:@<<DBIP>>:<<Port>>:<<SID>> -username <<weblogicUserName>> -cmd
import -file <<Path of BPM FactDataExport zip file >> -mode update -migrate 1

```

7.6.7.4 Enable publishing to BAM 12c.

Once the migration is complete, enable publishing to BAM 12c by setting the `DisableProcessMetrics` parameter to **false**.

1. Log in to the Fusion Middleware Control console.
2. In the Target Navigation pane, expand the Weblogic Domain node.
3. Select the domain in which the Oracle BAM server is installed.
For example, the domain might be `soainfra` or `base_domain`.
4. Right-click on the domain and select **System MBean Browser**.
The System MBean Browser page appears.
5. In the System MBean Browser, expand the Application Defined MBeans node.
6. Under Application Defined MBeans, expand the `oracle.as.soainfra.config` node.
7. Under `oracle.as.soainfra.config`, expand the `Server: server_name` node.
8. Under `Server: server_name`, expand the **AnalyticsConfig** node.
9. Under **AnalyticsConfig**, click **analytics**.
The analytics attributes are listed.
10. Change the value of the `DisableProcessMetrics` attribute to **false**.
11. Click **Apply**.

Note:

If there are any errors while importing the archive files, you can roll back all of the imported data in the BAM 12c process star schema data objects by running the rollback SQL file.

From a BAM 12c database SQL prompt, log in as the SOAINFRA schema user, navigate to the <PATH> directory and execute the following command:

```
sql> @rollbackMonitorExpressMigration.sql
```

For additional error handling procedures, see [Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#).

7.6.8 Task 8: Generating 11g Compatible Process Star Schema Data Views in 12c (Optional)

If you have an Oracle Fusion Middleware 11g application built on top of 11g process star schema views, and you want to continue to use the application in 12c, then you will need to recreate the views after the upgrade. The Star schema database views in 12c are different from the 11g views and cannot be automatically upgraded.

Specifically, the star schema database views in 12c have different names, are based on top of Oracle BAM data objects (and not on process cube tables), and are created at the composite level (instead of process level as in 11g). An automated utility is provided to assist you in recreating your views - both standard and process-specific - for use in your Oracle 12c environment.

[Task 1: Update the classpath to include the interface JAR file.](#)

[Task 2: Recreate Standard Views](#)

[Task 3: Recreate Process-Specific Views](#)

7.6.8.1 Task 1: Update the classpath to include the interface JAR file.

You must update the CLASSPATH to include the location of the oracle.bpm.analytics.interface.jar file located in the SOA Home.

For example:

```
DOMAIN_HOME/soa/modules/oracle.bpm.runtime_11.1.1/  
oracle.bpm.analytics.interface.jar
```

7.6.8.2 Task 2: Recreate Standard Views

Use the **Standard View 11g Migration Utility** to create 12c compatible versions of the following 11g standard views:

```
BPM_ACTIVITY_DEFINITION_V  
BPM_ACTIVITY_INSTANCE_V  
BPM_ACTIVITY_PERFORMANCE_V  
BPM_PROCESS_DEFINITION_V  
BPM_PROCESS_INSTANCE_V  
BPM_PROCESS_PERFORMANCE_V  
BPM_ROLE_DEFINITION_V
```

Use the following command to run the utility:

```
java -cp $DOMAIN_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.analytics.interface.jar
oracle.bpm.analytics.cube.persistence.util.StandardView11gMigrationUtil <initialContextFactory> <protocol> <hostname> <soa-port> <username>[]
```

Where:

- *initialContextFactory* is the JNDI Initial Context Factory such as `weblogic.jndi.WLInitialContextFactory`
- *protocol* is the RMI / JNDI protocol configured for the target server. Specify `t3`, `IIOP`, `HTTP`, `T3s`, `IIOPS`, or `HTTPS`.
- *hostname* is the full name of the host such as `soa.mycompany.com`
- *soa-port* is the SOA listening port such as `7001`
- *username* is the server login name such as `weblogic`.

7.6.8.3 Task 3: Recreate Process-Specific Views

Use the **Process Specific View 11g Migration Utility** to create 12c compatible versions of the following 11g process-specific views:

```
BPM_ACTV_INST_<viewIdentifier>_V
BPM_ACTV_PERF_<viewIdentifier>_V
BPM_PRCES_INST_<viewIdentifier>_V
BPM_PRCES_PERF_<viewIdentifier>_V
```

Use the following command to run the utility:

```
java -cp $DOMAIN_HOME/soa/modules/oracle.bpm.runtime_11.1.1/
oracle.bpm.analytics.interface.jar
oracle.bpm.analytics.cube.persistence.util.ProcessSpecificView11gMigrationUtil <initialContextFactory> <protocol> <hostname> <soa-port> <username> [<composite-name>]
```

Where:

- *initialContextFactory* is the JNDI Initial Context Factory such as `weblogic.jndi.WLInitialContextFactory`
- *protocol* is the RMI / JNDI protocol configured for the target server. Specify `t3`, `IIOP`, `HTTP`, `T3s`, `IIOPS`, or `HTTPS`.
- *hostname* is the full name of the host such as `soa.mycompany.com`
- *soa-port* is the SOA listening port such as `7001`
- *username* is the server login name such as `weblogic`.
- *composite-name* (optional) is the name of a single composite you want to create views

7.7 Recovering from a Failed Oracle BAM Upgrade

This section applies only when there are BAM servers in the domain. As part of BAM Upgrade, you can export BAM archives from 11g and import them into BAM 12c. If you receive any errors during this process, use this section to try to resolve the issues.

[Resolving the CFGFWK-60950 Error](#)

[Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration](#)

[Error Handling for UNIX Operating Systems](#)

[Error Handling for Windows Operating Systems](#)

7.7.1 Resolving the CFGFWK-60950 Error

If you received the **CFGFWK-60950** error, rename the BAM templates as described in [“Renaming the Oracle BAM Templates Before Upgrading the 11g Schemas”](#) and launch the Reconfiguration Wizard again.

If you received this error, you will need restore your entire pre-upgrade environment, perform the necessary pre-upgrade tasks and then perform the steps in the section listed above before you can attempt the reconfiguration process again.

7.7.2 Error Handling: 11g Process Cubes to BAM 12c Star Schema Migration

You may be able to resolve common errors by rolling back the data changes and rerunning the scripts with modified options.

Rollback All Data Changes:

1. Open a SQL session on the SOA database.
2. Log in as the SOAINFRA schema user and run the following script to roll back any data changes:

```
"<exportDir>/rollBackBPMProcessCubesMigration.sql"
```

Review the recommendations for your operating system:

- [Error Handling for UNIX Operating Systems](#)
- [Error Handling for Windows Operating Systems](#)

7.7.3 Error Handling for UNIX Operating Systems

If any unexpected errors occurred during migration, you can try the following steps to correct the issues:

For Errors that Occurred During the Import Phase:

If the error occurred while importing archives to BAM 12c, rerun the shell script "migrateBPMProcessCubes.sh" as described in [Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\)](#)., but add the **"-importOnly"** option. This can save time by skipping the export step.

For example:

```
cd $ORACLE_HOME/bam/bin
./migrateBPMProcessCubes.sh -serverUrl <BAM 12c server url> -serverPort <BAM 12c
server port> -serverUserName <BAM 12c server user> -dbUrl <soa db jdbc url> -
dbUserName <soainfra schema username> -exportDir <export dir> [-exportType ALL] [-
importOnly]
```

For Errors that Occurred During the Export Phase:

If the error occurred while exporting archives from BPM Process cubes, perform the following tasks:

1. Create a backup copy of the export directory defined as (*<exportDir>*)
2. Delete the contents of the *<exportDir>*.
3. Rerun the shell script "migrateBPMProcessCubes.sh" as described in [Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\)](#), but **remove the "-importOnly" option**.

For example:

```
cd $ORACLE_HOME/bam/bin
./migrateBPMProcessCubes.sh -serverUrl <BAM 12c server url> -serverPort <BAM 12c
server port> -serverUserName <BAM 12c server user> -dbUrl <soa db jdbc url> -
dbUserName <soainfra schema username> -exportDir <export dir> [-exportType ALL]
```

Additional Information:

You can also try the following to help resolve any issues:

- After importing each archive to BAM 12c, review the bamcommand.log.* files located in the \$ORACLE_HOME/bam/bin directory to make sure no errors occurred.
- Review the migration logs located in the *<exportDir>/MigrationLogs.** :

7.7.4 Error Handling for Windows Operating Systems

Roll back all of the data changes as described above, and then try the following:

For Errors that Occurred During the Import Phase:

Reimport the archives as described in the following sections:

- [Task 5: \(Windows Only\) Import dimension data \(DimensionExport.zip\) into the BAM server.](#)
- [Task 6: \(Windows Only\) Import active fact data \(ActiveFactDataExport.zip\) into the BAM server.](#)
- [Task 7: \(Windows Only - if exportType=ALL\) Import completed fact data \(CompletedFactDataExport.zip\) into the BAM server.](#)

For Errors that Occurred During the Export Phase:

If the error occurred while exporting archives from BPM Process cubes, perform the following tasks:

1. Create a backup copy of the export directory defined as (*<exportDir>*)
2. Delete the contents of the *<exportDir>*.
3. Rerun the shell script "migrateBPMProcessCubes.sh" as described in [Migrate 11g Process Cubes to BAM 12c Process Star Schema \(BPM Users Only\)](#), but **remove the "-importOnly" option**.

For example:

```
java -cp
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.interface.jar;
%ORACLE_HOME%\soa\modules
```

```
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.model.jar;
%ORACLE_HOME%\oracle_common\modules\oracle.jdbc_12.1.0\ojdbc6.jar;
%ORACLE_HOME%\bam\modules\oracle.bam.client\bam-client.jar;%ORACLEHOME%\bam\lib
\bam-schema.jar;
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.analytics.metrics.dataobject.jar;
%ORACLE_HOME%\soa\modules
\oracle.bpm.runtime_11.1.1\oracle.bpm.hwfanalytics.dataobject.jar

oracle.bpm.metrics.dataobject.migration.application.MigratellgProcessCubestol2cDO
-url <soa db jdbc url> -userName <soa schema user name> -exportDir <export
directory path> [-exportType ALL]
```

4. Repeat the remaining migration steps in [Migrate the 11g Monitor Express data to BAM 12c Process Star schema. \(Optional\)](#).

Upgrading Oracle Service Bus

Describes the upgrade-specific tasks for upgrading Oracle Service Bus without Oracle SOA Suite and Business Process Management.

When upgrading Oracle Service Bus 11g to Release 12c, you must perform the pre- and post-upgrade tasks described in this chapter. Failure to do so may result in a non-functioning post-upgrade environment.

[Understanding the Oracle Service Bus Upgrade to 12c](#)

[Upgrading Multiple Components that use UMS in a Single OSB Domain \(Not Supported\)](#)

If your OSB 11g topology is configured with more than one component within a single domain, then you will not be able to upgrade to 12c (12.2.1).

[Performing Pre-Upgrade Tasks for Oracle Service Bus \(OSB\)](#)

[Migrating Oracle Service Bus Resources from Previous Releases](#)

[Installing the Oracle Service Bus](#)

[Upgrading an OSB Domain \(Without SOA\)](#)

[Reconfiguring an OSB Domain](#)

[Upgrading the WebLogic Component Configurations](#)

[Performing Post Upgrade Tasks for Oracle Service Bus](#)

[Troubleshooting Oracle Service Bus Upgrade](#)

8.1 Understanding the Oracle Service Bus Upgrade to 12c

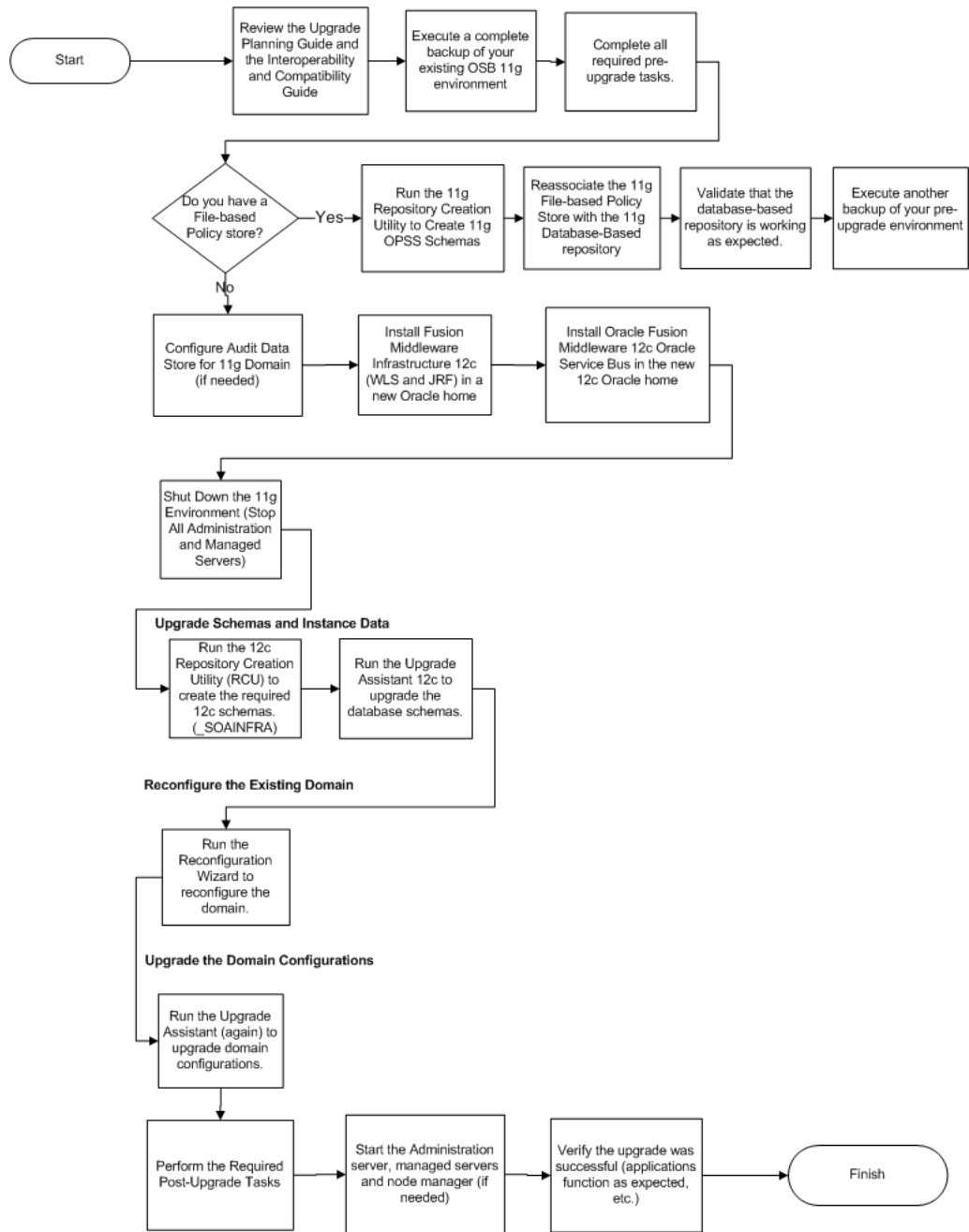
Oracle Service Bus (OSB) can be upgraded to 12c (12.2.1) with or without Oracle SOA Suite and Business Process Management. The upgrade steps in this chapter describe how to upgrade Oracle Service Bus without SOA.

If OSB is part of your SOA 11g domain, and you will be upgrading OSB as part of your SOA Suite upgrade to 12c (12.2.1), follow the standard upgrade process described in [Upgrading to SOA Suite and Business Process Management 12c \(12.2.1\)](#).

If you are upgrading Oracle Service Bus without SOA, use the upgrade procedures documented in this chapter. Note that even though your domain does not include SOA, you will still have to upgrade the `_SOAINFRA` schema to upgrade OSB data. OSB does not have a separate schema.

Note:

Be sure to review all of the OSB-specific pre- and post-upgrade steps. All OSB upgrades (with and without SOA) require these additional steps when upgrading to 12c (12.2.1).



Step	Description	More Information
Perform ALL pre-upgrade tasks.	Perform the standard 12c pre-upgrade tasks, applicable SOA pre-upgrade tasks, as well as any OSB-specific tasks that apply to your deployment.	Oracle Fusion Middleware 12c Pre-Upgrade Checklist Performing SOA-Specific Pre-Upgrade Tasks Performing Pre-Upgrade Tasks for Oracle Service Bus (OSB)
Make sure that your Policy Store is database-based	This important pre-upgrade tasks must be completed before you upgrade Oracle Service Bus to 12c.	Reassociating File-based Policy Stores to Database-based Policy Stores (Required)
Upgrade the WebLogic server and JRF that will host your OSB domain.	You must install the 12c infrastructure and then upgrade the infrastructure domain before upgrading Oracle Service Bus.	Installing the 12c (12.2.1) Infrastructure Distributions Before Upgrade
Install Oracle Service Bus.	Obtain the OSB distribution and install the content to a new Oracle Home.	Installing the Oracle Service Bus
Upgrade Oracle Service Bus.	Follow the steps in this chapter to upgrade your existing Oracle Service Bus domain.	Upgrading an OSB Domain (Without SOA)
Perform all post-upgrade tasks.	Perform the standard 12c post-upgrade tasks as well as any post-upgrade OSB-specific tasks that apply to your deployment.	Performing Post Upgrade Tasks Performing Post Upgrade Tasks for Oracle Service Bus Troubleshooting Oracle Service Bus

8.2 Upgrading Multiple Components that use UMS in a Single OSB Domain (Not Supported)

If your OSB 11g topology is configured with more than one component within a single domain, then you will not be able to upgrade to 12c (12.2.1).

Certain Fusion Middleware components such as Oracle SOA, OSB and Business Activity Monitoring (BAM) have a dependency on User Messaging Service (UMS) in 12c. If you configure more than one of these components within a single 12.2.1 domain, then **each of these components must run within its own cluster** — even if there is only one server that runs that component.

In order to upgrade these components, you must create a separate cluster for each component during the domain reconfiguration as described in [Clusters](#).

The supported upgrade topology for these components is described in [Upgrading a Clustered Topology](#).

8.3 Performing Pre-Upgrade Tasks for Oracle Service Bus (OSB)

If you are upgrading Oracle Service Bus, you must perform the following tasks before you begin the upgrade. Review your own use case scenarios and existing deployment to determine if the following tasks apply to your environment.

[Creating Schemas for Oracle Service Bus](#)

[Deploying Oracle Web Services Manager Policy Manager in Your 11g Environment](#)

[Exporting Services, Projects and Resources when Upgrading Oracle Service Bus](#)

[Deleting All Services, Projects and Resources](#)

8.3.1 Creating Schemas for Oracle Service Bus

Oracle Service Bus does not have its own schema as all database schema data for Oracle Service Bus is incorporated in the SOAINFRA schema. So, while its possible to run Oracle Service Bus without running Oracle SOA, you must create the `_SOAINFRA`, `_UMS` and `_STB` schemas before you begin the upgrade.

For more information, see "Creating the Required Schemas with the Repository Creation Utility".

8.3.2 Deploying Oracle Web Services Manager Policy Manager in Your 11g Environment

If Oracle Web Services Manager (OWSM) Policy Manager is not already deployed in your Oracle Service Bus 11g environment, then you must manually deploy it before you upgrade to 12c.

In 11g, both WebLogic security policies and OWSM policies were supported on Oracle Service Bus. As of 11g (11.1.1.7), WebLogic Security policies were deprecated, and are not supported in 12c (12.1.3). Because WebLogic security policies were available in 11g, deployment of the OWSM Policy Manager and use of the OWSM policies was optional. Since only OWSM policies are supported in 12c, OWSM Policy Manager deployment is mandatory.

For information on manually deploying the OWSM Policy Manager in your 11g environment, see "Installing OWSM with WebLogic Server" in *Securing Web Services and Managing Policies with Oracle Web Services Manager*.

8.3.3 Exporting Services, Projects and Resources when Upgrading Oracle Service Bus

You must export services, projects and resources into a configuration JAR file before you can upgrade to Oracle Service Bus 12.2.1. After the upgrade, you will import the JAR file to the new 12c environment.

Note that you can manually export resources and services from older, supported releases. See [Migrating Oracle Service Bus Resources from Previous Releases](#).

For more information, see "Importing and Exporting Resources and Configurations" in *Developing Services with Oracle Service Bus*.

8.3.4 Deleting All Services, Projects and Resources

After the export, you must delete all user-created services, projects and resources before the upgrade.

For information on using the Oracle Service Bus Console to delete resources, see [How to Delete Projects, Folders, and Resources](#).

For information on using JDeveloper to delete resources, see [How to Delete a Project or Resource](#).

8.4 Migrating Oracle Service Bus Resources from Previous Releases

You can manually export resources and services from the following releases and use them with Oracle Service Bus 12c (12.2.1):

- Oracle Service Bus 12c Release: 12.1.3.0.0
- Oracle Service Bus 11g Release: 11.1.1.7.0
- Oracle Service Bus 10.3 Releases: 10.3.1 and 10.3.0
- AquaLogic® Service Bus Releases 3.0 and later

For more information, see "Importing and Exporting Resources and Configurations" in *Developing Services with Oracle Service Bus*.

8.5 Installing the Oracle Service Bus

To install Oracle Service Bus, refer to *Installing and Configuring Oracle Service Bus*.

You can install and upgrade Oracle Service Bus without Oracle SOA Suite and Business Process Management, but you must still install the Oracle Fusion Middleware Infrastructure 12c (12.2.1) before upgrading Oracle Service Bus. For more information, see *Installing and Configuring the Oracle Fusion Middleware Infrastructure*.

Note:

If you want to use Oracle Web Services Manager policies with Oracle Service Bus, then you must select the Oracle Web Services Manager extension template after selecting one of the Oracle Service Bus domain templates when configuring the Oracle WebLogic domain.

8.6 Upgrading an OSB Domain (Without SOA)

To upgrade Oracle Service Bus, you will follow the basic procedures described in [Table 8-1](#).

Table 8-1 Upgrade Assistant Screens: Upgrading Schemas

Screen	Description and Action Required
Welcome	This screen provides an overview of the Upgrade Assistant and some information about important pre-upgrade tasks.
Schemas	Select Individually Selected Schemas . NOTE: There is no OSB schema. All database schema data for Oracle Service Bus is incorporated in the SOAINFRA schema.

Table 8-1 (Cont.) Upgrade Assistant Screens: Upgrading Schemas

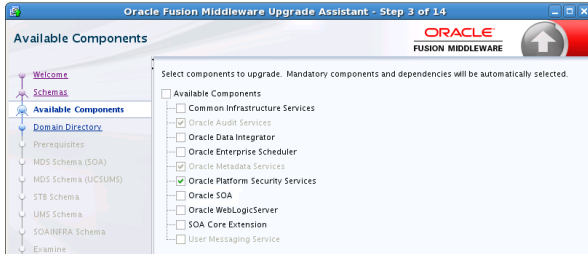
Screen	Description and Action Required
Available Components	<p>This screen provides a list of installed Oracle Fusion Middleware components that have schemas that can be upgraded. When you select a component, the schemas and any dependencies are automatically selected.</p> <p>When upgrading OSB, select Metadata Services, Audit Services and Oracle Platform Security Services.</p>
	
Domain Directory	<p>This screen appears if you selected Oracle Platform Security Services or Oracle Audit Services on the Available Components screen.</p> <p>Enter the absolute path to the existing WebLogic domain directory, or click Browse to navigate to and select the 11g domain directory you are upgrading.</p>
Prerequisites	<p>Check that the prerequisites for schema upgrade are met. You must select each prerequisite before you click Next.</p> <p>CAUTION: Upgrade Assistant will NOT verify that these prerequisites have been met.</p>
Schema Credentials	<p>Use this screen to enter database connection details for each of the schemas you are upgrading.</p>
Examine	<p>Review the status of the Upgrade Assistant as it examines each component, verifying that the component is ready for upgrade.</p> <p>Verify that the Source Version displayed for each schema is listing the correct version number for the schema to be upgraded.</p>
Upgrade Summary	<p>Review the summary of the options that you have selected for schema upgrade. Verify that the correct Source and Target versions are listed for each schema you intend to upgrade.</p> <p>Click Upgrade to upgrade the schemas, or click Back if you wish to change the configurations.</p>

Table 8-1 (Cont.) Upgrade Assistant Screens: Upgrading Schemas

Screen	Description and Action Required
Upgrade Progress	<p>Review the status of the current upgrade process.</p> <p>NOTE: The progress bar on this screen displays the progress of the current upgrade procedure. It does not indicate the time remaining for the upgrade.</p> <p>Click Next when the upgrade is complete.</p>
Upgrade Success	<p>Click Close if the Upgrade was successful.</p> <p>If the upgrade failed or if you canceled the upgrade before it completed successfully, you should review the log files, restore the backed up environment, and restart the Upgrade Assistant.</p>

8.7 Reconfiguring an OSB Domain

After the schema upgrade, you must reconfigure the 11g OSB domain using the Oracle Reconfiguration Wizard. This process is identical to the SOA domain reconfiguration procedures described in [Reconfiguring the Domain Using the Reconfiguration Wizard](#).

8.8 Upgrading the WebLogic Component Configurations

You will run the Upgrade Assistant a second time, after the domain reconfiguration, to upgrade any component configurations in the 11g OSB domain.

This process is described in [Upgrading the Domain Component Configurations Using the Upgrade Assistant](#).

8.9 Performing Post Upgrade Tasks for Oracle Service Bus

After a successful upgrade, you may need to perform one or more of the following tasks. Review your own use case scenarios and existing deployment to determine if the following tasks apply to your environment.

Note:

If you experience any post-upgrade issues with Oracle Service Bus, refer to [Troubleshooting Oracle Service Bus](#) for a list of common solutions.

[Importing Domain Configuration Data](#)

[Importing Security Configurations](#)

[Upgrading Your XQuery Resources](#)

[Understanding 12c Split-Joins](#)

8.9.1 Importing Domain Configuration Data

After the upgrade you will need to import the domain configuration data that you exported in [Exporting Services, Projects and Resources when Upgrading Oracle Service Bus](#).

For more information, see [How to Import Resources from a Configuration JAR File in the Console and Executing a Configuration File](#).

8.9.2 Importing Security Configurations

Use the Oracle WebLogic Administration Console to import the security data that you exported pre-upgrade into the new Oracle Service Bus domain.

For more information, see the "Import data into a security provider" section of the *Oracle WebLogic Server Administration Console Online Help*.

Note:

You must import the security information for each security provider separately.

8.9.3 Upgrading Your XQuery Resources

Oracle Service Bus supports XQuery 1.0. The older XQuery 2004 is also supported. Any new XQuery resource created in Service Bus uses the XQuery 1.0 version, by default.

If you have upgraded from a pre-12c Service Bus project, all XQuery resources in the project are configured to use the XQuery 2004 version.

For more information on upgrading XQuery Resources, see [How to Upgrade Your XQuery Resources to use XQuery 1.0](#).

8.9.4 Understanding 12c Split-Joins

The 11g split-join business service will no longer exist in 12c because in 12c there is a direct way to invoke a split-join component from a pipeline or a proxy service. The upgrade process will automatically change all statically configured invoke references to a split-join business service as follows:

- The flow business service is removed. This means the `Timeout` property configured for the Flow business service is also removed.
- If the business service is located in the **same project** as the proxy service that invokes it, then the pipeline associated with that proxy service invokes the split-join directly.
- If the business service is located in a **different project** from the proxy service that invokes it, then a local proxy service is created to invoke the split-join. The local proxy service is invoked by the original proxy service.

8.10 Troubleshooting Oracle Service Bus Upgrade

If you experience post-upgrade issues with Oracle Service Bus, review the following and apply any relevant solutions.

Resolving the HTTP 404 Error After OSB Upgrade with OHS as Cluster Frontend Host

Resolving the HTTP 404 Error When Accessing OSB Console

8.10.1 Resolving the HTTP 404 Error After OSB Upgrade with OHS as Cluster Frontend Host

If you configure Oracle HTTP Server (OHS) as a cluster domain frontend host, then you must add the following code to the OHS configuration file (ohs.config):

```
<Location /sbconsole>
  SetHandler weblogic-handler
  WebLogicCluster [ADMIN_SERVER_HOST]:[ADMIN.SERVER:PORT]
</Location>
<Location /servicebus>
  SetHandler weblogic-handler
  WebLogicCluster [ADMIN_SERVER_HOST]:[ADMIN.SERVER:PORT]
</Location>
```

Where `ADMIN.SERVER:PORT` is the machine name, server name and port number used for the OHS.

`mymachine.us.mycompany.com:7001` as shown in this sample code example:

```
<Location /sbconsole>
  SetHandler weblogic-handler
  WebLogicCluster mymachine.us.mycompany.com:7001
</Location>
<Location /servicebus>
  SetHandler weblogic-handler
  WebLogicCluster mymachine.us.mycompany.com:7001
</Location>
```

8.10.2 Resolving the HTTP 404 Error When Accessing OSB Console

Prior to 12c, the OSB console was accessed using the following URL: `http://[HOST]:[PORT]/sbconsole`

In 12c, the OSB Console URL has changed to: `http://[HOST]:[PORT]/servicebus`.

After the upgrade, if you enter `http://[HOST]:[PORT]/sbconsole`, it should redirect to `http://[HOST]:[PORT]/servicebus`.

If the redirect fails, and you receive a HTTP 404 error, try directly entering the 12c URL: `http://[HOST]:[PORT]/servicebus`.

Performing Post Upgrade Tasks

This chapter summarizes the tasks you might have to perform after upgrading to SOA 12c.

This chapter includes the following sections:

Note:

There are additional component-specific post upgrade tasks for the following:

For Business Activity Monitoring (BAM), see [Upgrading SOA with Oracle Business Activity Monitoring \(Oracle BAM\)](#) and

For Oracle Service Bus (OSB), see [Performing Post Upgrade Tasks for Oracle Service Bus](#)

For User Messaging Service (UMS), see [Upgrading User Messaging Service](#).

[Performing Post Upgrade Tasks](#)

[Verifying that the Upgraded Components Work as Expected](#)

9.1 Performing Post Upgrade Tasks

The following tasks should be performed after an upgrade:

[Reapplying Start Script Properties for JVM](#)

[Reapplying Customizations to setDomainEnv](#)

[Reapplying Customizations to XEngine Configuration Files](#)

[Copying Custom XPath Classes](#)

[Recreating Partition-Specific Roles for Application Roles and Policies](#)

[Starting and Stopping Servers](#)

[Upgrading Business Process Management \(BPM\) Metadata](#)

[Configuring an Oracle Fusion Middleware 12c Audit Data Store](#)

[Upgrading ServerSocket with Remote Clients](#)

[Reconfiguring Threads for SOA 12c](#)

9.1.1 Reapplying Start Script Properties for JVM

If you used a start script to specify required startup properties, or to perform any other work required at start up in your 11g environment, then you will need to reapply the properties post-upgrade.

Specifically, if you have configured JRockit JVM arguments in your 11g environment, then these configurations must be reapplied post-upgrade. Oracle recommends that you use either `startup-plan.xml` or `startscript.xml` for configuring JVM startup parameters.

Caution:

Failure to update the start script arguments may prevent you from starting the SOA and OSB servers after the upgrade.

To enable the scripts:

1. In the `nodemanager.properties` file, set the `StartScriptEnabled` property to `true`. (The default is `false`.) If your start script is named `startWebLogic.sh` or `startWebLogic.cmd`, Node Manager uses one of those scripts as the default.
2. If you want to specify a custom start script, set the `StartScriptName` property to the name of your script in the `nodemanager.properties` file.

Node Manager sets the `JAVA_VENDOR`, `JAVA_HOME`, `JAVA_OPTIONS`, `SECURITY_POLICY`, `CLASSPATH`, and `ADMIN_URL`. It retrieves these values from the `ServerMBean`, `ServerStartMBean`, and `SSLMBean` when you use the Administration Console to start the server, or WLST connected to the Administration Server. When you use WLST connected directly to the Node Manager, you can specify the values; otherwise, they are left empty.

Node Manager combines all of the command line startup options (-D flags) that are specified in the `ServerStartMBean Arguments` attribute, as well as the `SSLArguments` into a single environmental variable called `JAVA_OPTIONS`. `SSLArguments` are retrieved from the values in the `SSLMBean`. The `SSLMBean` is inspected for `ignoreHostnameVerification`, `HostnameVerifier`, and `ReverseDNSAllowed` values, then those values are appended to the -D flags. All of those flags comprise the `SSLArguments` parameter. All of the values for `SSLArguments` as well as `Arguments` in the `ServerStartMBean` comprise the `JAVA_OPTIONS` environment variable that is defined for the start script. In addition, the script will append any of its own defined values onto this environment variable.

9.1.2 Reapplying Customizations to `setDomainEnv`

To complete the upgrade of your SOA Suite and BPM environment to 12.2.1 it might be necessary to re-apply any customizations to startup scripts, such as `setDomainEnv`.

If servers do not start or start in AdminMode, the cause is most likely that the `setDomainEnv.sh` changes from 11g were not reapplied to the 12c domain. Compare `setDomainEnv` from 11g to 12c and then add any custom changes after the upgrade.

For more information, see "Re-apply Customizations to Startup Scripts".

Note:

To prevent losing your customizations in a future upgrade, see *Maintaining Custom setDomainEnv Settings in Planning an Upgrade of Oracle Fusion Middleware*.

9.1.3 Reapplying Customizations to XEngine Configuration Files

Any pre-upgrade changes made to the XEngine configuration files, such as `SeverityConfig.xml`, will be overwritten by new, regenerated configuration files during the domain reconfiguration process. Therefore, all customized settings used in the pre-upgrade configuration files will need to be reapplied after the upgrade.

For example, if you added a section for SNIP in the pre-upgrade XEngine configuration file, `SeverityConfig.xml`, the same section will have to be added to the new, post-upgrade `SeverityConfig.xml` file.

9.1.4 Copying Custom XPath Classes

After the upgrade you will need to copy any customized XPath classes to the new 12c Oracle Home `/classes` directory as shown in the example below:

Copy the custom XPath classes from:

```
<11g Oracle Home>/soa/modules/oracle.soa.ext_11.1.1/classes
```

to:

```
<12c Oracle Home>/soa/modules/oracle.soa.ext_11.1.1/classes  
folder
```

9.1.5 Recreating Partition-Specific Roles for Application Roles and Policies

After the upgrade, you will have to recreate any partition-specific roles used in your 11g environment.

Partition application roles for existing applications are not recreated by the 12c upgrade process. Instead, you must manually create these roles using the following WLST script:

```
sca_createDefaultPartitionAppRoles partition
```

9.1.6 Starting and Stopping Servers

After the upgrade of SOA Suite and BPM with integrated components, you should start all of the Administration and Managed servers for your environment and make sure that they are functioning as expected.

You will continue to start the servers from the upgraded 11g domain home, as the domain upgrade was performed in place.

The order in which you START and STOP the servers is important, and failure to start or stop them in the correct order can cause issues with the deployment.

Note:

Procedures for starting and stopping Oracle Fusion Middleware, including the Administration Server, Managed Servers, and components are provided in *Starting and Stopping Oracle Fusion Middleware*

Start servers in this order:

1. Webtier (including the Oracle HTTP Server)
2. Node Managers
3. Administration Servers
4. Oracle Web Services Manager (OWSM) Managed Server
5. Service-Oriented Architecture (SOA) Managed Server
6. Oracle Service Bus (OSB) Managed Server
7. Business Activity Monitoring (BAM) Managed Server

Stop servers in this order:

1. Business Activity Monitoring (BAM) Managed Server
2. Oracle Service Bus (OSB) Managed Server
3. Service-Oriented Architecture (SOA) Managed Server
4. Oracle Web Services Manager (OWSM) Managed Server
5. Administration Servers
6. Node Managers
7. Webtier (including the Oracle HTTP Server)

9.1.7 Upgrading Business Process Management (BPM) Metadata

The BPM metadata upgrade begins once you log into Business Process Composer 12c (12.2.1) for the first time (after a successful upgrade).

For more information on using Business Process Composer, see *Developing Business Processes with Oracle Business Process Composer*.

9.1.8 Configuring an Oracle Fusion Middleware 12c Audit Data Store

As a part of the overall upgrade process, you should have created the IAU schema in the database where your other Oracle Fusion Middleware schemas reside. For more information about using the Audit Data Store, see *Managing the Audit Data Store*.

9.1.9 Upgrading ServerSocket with Remote Clients

There is a change in behavior in which the ServerSocket is created when you upgrade from Oracle Release 11g to Release 12g. Because of this, remote clients might not be able to connect to the ServerSocket when the hostname is configured as localhost. As a workaround, the localhost should be changed to hostname.

9.1.10 Reconfiguring Threads for SOA 12c

Starting in Oracle SOA Suite 12c (12.2.1), Work Managers handle most SOA-related work threads. The thread configurations you specified for SOA 11g will not apply to your upgraded SOA 12c environment. You will have to reconfigure the threads after upgrading to SOA 12c.

For more information on using the new threading model, see "Tuning the SOA Infrastructure" in *Tuning Performance*.

9.2 Verifying that the Upgraded Components Work as Expected

After a successful upgrade, you should perform the following tasks to make sure that the components are still working as expected and that there are no issues with the new deployment.

- [Verifying the Domain Component Configurations Upgrade](#)
- [Verifying the Database Schema Upgrade Succeeded](#)
- [Understanding the Flow Trace Changes in 12c](#)

[Verifying the Domain Component Configurations Upgrade](#)

[Verifying the Database Schema Upgrade Succeeded](#)

[Understanding the Flow Trace Changes in 12c](#)

9.2.1 Verifying the Domain Component Configurations Upgrade

To verify that the domain component configurations upgrade was successful, log in to the Administration console and the Fusion Middleware Control using the following URLs, and verify the upgraded version numbers for each component:

Administration Console URL: `http://
administration_server_host:administration_server_port/console`

Fusion Middleware Control URL: `http://
administration_server_host:administration_server_port/em`

Note:

After the upgrade, you must run all of your administration tools from the new 12.2.1 Oracle home and not from the 11g Oracle home.

9.2.2 Verifying the Database Schema Upgrade Succeeded

In addition to the Upgrade Assistant Upgrade Status screens, you can also manually validate that the database schema upgrade and instance upgrade was successful by using SQL commands.

For more information, see [Monitoring Upgrade Status with SQL Queries](#).

9.2.3 Understanding the Flow Trace Changes in 12c

In 12c SOA, instances are controlled using flowIDs instead of ECIDs. When the Upgrade Assistant upgrades instances from 11g SOA to 12c SOA, there are few

differences between the 11g upgraded flow instances and the newly created 12c instances. These differences will not impact the functionality of the flow trace, but it is important to note the differences.

The flow trace XML examples below show the following differences:

- The attributes `ActionType` and `ActionName` are new in 12c and are not available in 11g upgraded instances.
- `Date` and `lastUpdatedDate` are the same for 11g Upgraded instances.
- `ElapsedTime` for Entry Instance Id is 0 for 11g Upgraded instances.

Flow trace XML for 11g to 12c upgraded instances:

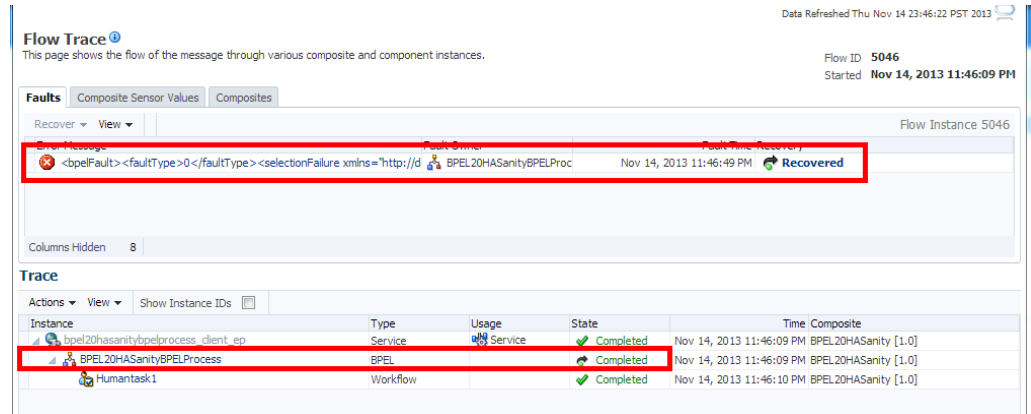
```
=====
<audit_trail
  ecid="9dd01e5816e19dbc:-33f3b618:140clee8b0f:-8000-000000000000317e"
  flowId="96102" flowCorrelationId="null" activeInstances="0"
  date="2013-09-02 00:09:52.133 PDT" lastUpdatedDate="2013-09-02 00:09:52.156
  PDT" elapsedTime="23">
  <entry instanceId="10093" parentInstanceId="-110092" date="2013-09-02
  00:09:52.156 PDT" lastUpdatedDate="2013-09-02 00:09:52.156 PDT"
  elapsedTime="0" timestamp="1378105792156" state="18" subType="bpel"
  type="component">
    ...
  </entry>
</audit_trail>
```

Flow trace XML in newly created 12c instances:

```
=====
<audit_trail ecid="dfcc3828-d7de-4af8-b94e-474ff830c961-0000069a" flowId="6"
  flowCorrelationId="0000K7z3tBPFCCGpIwt1if1IRXgh00000M" activeInstances="0"
  date="2013-10-28 05:35:12.738 PDT" lastUpdatedDate="2013-10-28 05:35:12.825
  PDT" elapsedTime="87">
  <entry instanceId="13" parentInstanceId="12" date="2013-10-28
  05:35:12.749 PDT" lastUpdatedDate="2013-10-28 05:35:12.786 PDT"
  elapsedTime="37" timestamp="1382963712749" state="18" actionType="operation"
  actionName="process" subType="bpel" type="component">
    ...
  </entry>
</audit_trail>
```

In addition, the Recovery status of the new instances created in 12c for a caught fault in BPEL shows the fault as recovered as shown in [Figure 9-1](#):

Figure 9-1 New 12c Instance Flow Trace

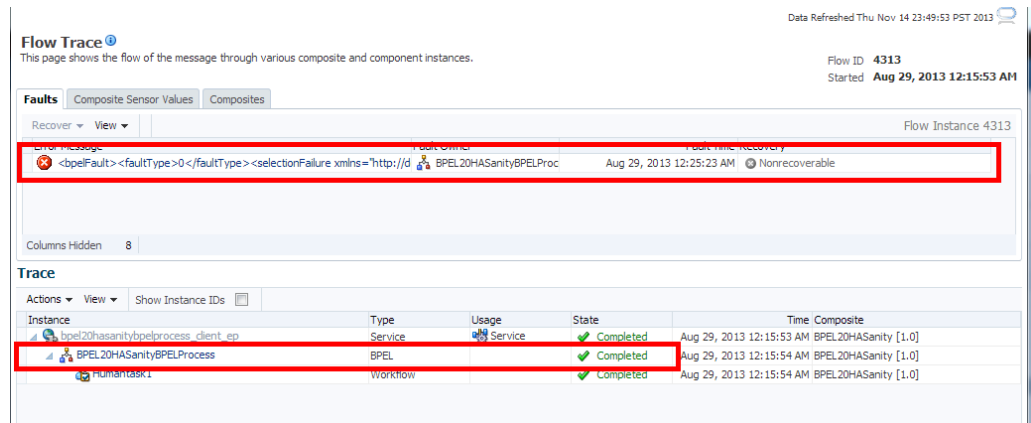


However, the Recovery status of an **upgraded 11g instance** for a caught fault in BPEL shows the fault as Nonrecoverable as shown in Figure 9-2:

Note: The information passed from the 11g faults is not enough to correctly identify the state of a fault. To handle this, all the actual faults retrieved from 11g are initially identified as nonrecoverable. Dummy faults are then created to set the proper state (BPTEL_invoke_recovery, Bpel_activity_recovery).

Therefore, if you see a warning or notice that the 11g faults are nonrecoverable, you can ignore the warning.

Figure 9-2 Upgraded 11g Instance Flow Trace



Administering and Monitoring the Upgrade of SOA Instances

Describes how open and closed SOA instances are upgraded to 12c (12.2.1) and the options a user has to administer and monitor the upgrade process.

The standard upgrade process for SOA Suite and BPM 12c provides an automated solution that will upgrade your open and closed instances. The upgrade of closed instances can be monitored and configured with the administration scripts described in the following sections:

[Understanding the Instance Upgrade Process](#)

[Understanding Instance Upgrade Background Jobs](#)

[Using Purge Scripts Before You Upgrade](#)

[Using the Upgrade Administration Scripts](#)

[Configuring the Administration Scripts](#)

[Stopping Upgrade Sessions and Jobs](#)

[Restarting an Incomplete Upgrade](#)

[Monitoring Upgrade Status with SQL Queries](#)

[Monitoring Upgrade Status with Fusion Middleware Control](#)

[Resolving Instance Upgrade Errors](#)

[Restarting a Failed Upgrade](#)

10.1 Understanding the Instance Upgrade Process

The Upgrade Assistant framework delegates the upgrade of schemas to respective component installations (MDS, ORASDPM, OPSS, SOA, etc.) During the 12c SOA upgrade, the Upgrade Assistant can also upgrade instances.

What is being upgraded?

The SOA installation will also upgrade various components as part of upgrade process, including `_MDS` schema and the `_SOAINFRA` schema. The `_SOAINFRA` schema contains the following schema components:

- **Schema definitions** - such as tables and indexes
- **Metadata** - the data required to run the SOA server and SOA composites

Note:

The BPM metadata upgrade begins once you log into Business Process Composer 12c (12.2.1) for the first time (after a successful upgrade).

For more information on using Business Process Composer, see *Developing Business Processes with Oracle Business Process Composer*.

- **Instance Data** - the data created by the various composites. Instances can be open or closed.

How are these components upgraded?

During the 12c schema upgrade process, it is important to understand the order in which UA performs the upgrade of these components.

The upgrade occurs in four distinct stages:

1. Upgrade Assistant will upgrade 11g schema definitions.
2. Upgrade Assistant will then upgrade 11g metadata and create background control jobs to upgrade open instances.

NOTE: This process may be time consuming as the jobs will continue to run within UA until the final database job finishes upgrading the open instances. It is important not to close the Upgrade Assistant until the final job is complete.

For example, the time required to upgrade instances depends on the following:

- Size of *prefix_SOAINFRA* schema (number of open and closed instances)
 - System configuration (such as the number of CPI's (cores), memory usage, disk I/O configuration).
 - Speed of the system and size of driver tables
3. Once all of the open instances have been upgraded, the background jobs begin upgrading the closed instances. Note that the upgrade of closed instances continues to run in the background even after you close the Upgrade Assistant. However, if the background job is stopped, and there are still closed instances to be upgraded, then you must restart them with the administration scripts.
 4. Finally, once the last job finishes upgrading the open instances, the Upgrade Assistant provides the upgrade status and lists the next steps to take in the upgrade process.

You should review the Upgrade Success screen of the Upgrade Assistant to determine your next steps based on the information provided. **NOTE:** If you are running in -response (silent) mode, this information will be listed in the UA stdout file.

- If the Upgrade Assistant reports that there are no additional instances to be upgraded, then simply close the Upgrade Assistant UI and continue with the remaining upgrade procedures (launching the Reconfiguration Wizard for example).
- If the Upgrade Assistant reports that there was an error during the instance upgrade, then correct the error(s) and resubmit the database job to complete the upgrade. You can also use the Report Upgrade Summary administration script (Option 1) to check the `UPGRADE_ERROR_COUNT` section of the report.

- You will be notified that the upgrade of the closed instances will continue in the background after you close the Upgrade Assistant. **Do not close the Upgrade Assistant until UA reports it is finished and you see the following:**

Oracle SOA

1. The Upgrade Assistant has successfully upgraded all open instances. You can now close the Upgrade Assistant.
2. The automated upgrade of closed instances will continue in the background after the Upgrade Assistant is exited and until the SOA server is started, at which point the upgrade will stop. You can schedule the upgrade of any remaining closed instances for a time when the SOA server is less busy. Close the Upgrade Assistant and use the instance data administration scripts to administer and monitor the overall progress of this automated upgrade. For more information see "Administering and Monitoring the Upgrade of SOA Instance Data" in *Upgrading SOA Suite and Business Process Management*.

Note:

The upgrade of closed instances will continue until all instances have been upgraded or the middle tier is started (such as the SOA managed server, for example.)

If the middle tier is started before all closed instances are upgraded, then the upgrade job will stop. You will have to use the administration scripts to manually restart the upgrade.

10.2 Understanding Instance Upgrade Background Jobs

The background jobs are created by Upgrade Assistant during the `_SOAINFRA` schema upgrade. These jobs run in the background and automate the upgrade of the open and closed instance data. It is important to understand how these jobs operate within the upgrade process and how you can manage them. The list below describes some important information about these jobs:

- Jobs are created by Upgrade Assistant (UA), but they are managed through administration scripts. You can use the administration scripts to configure how and when these jobs will run, for example.
- Jobs are automatically started after the schema upgrade process.
- Jobs that are initiated through UA are automatically stopped when one of the following occurs:
 - The job is complete and all closed instances are migrated to 12c
 - A middle tier application is started (a managed server, for example)
 - The Stop Jobs script (Option 8) is started
- If closed instances have not yet been upgraded, then the background jobs will continue to run in the background - even after the Upgrade Assistant has been closed.
- If the job is stopped, and there are still instances to be upgraded, you can enable and schedule the jobs to run at another time using the administration scripts.

For more information on configuring the background jobs, see: [Enabling and Disabling Background Control Job \(Option 6\)](#), [Stopping Upgrade Sessions and Jobs](#), and [Restarting an Incomplete Upgrade](#).

10.3 Using Purge Scripts Before You Upgrade

Use the purge scripts before you start the instance upgrade to purge the closed 11g instances that you do not need in the upgraded 12c environment. The 12c purge scripts will include non-migrated closed instances. This means that post upgrade, if you schedule to run 12c Purge scripts, the scripts will purge non-migrated closed instances. Using the purge scripts to remove closed instances can help improve the overall performance of the upgrade.

Note:

When upgrading open instances only, you may see an aborted status flow. A flow will be in an aborted state if the child flow was aborted in 11g.

All composite instance associated with this ECID will remain in terminated state.

For more information on using Auto Purge or purge scripts, see [Managing Database Growth](#).

Caution:

Do not schedule purge jobs to run while the Upgrade Assistant background jobs are running. Running the scripts while Upgrade Assistant is running can cause the purge or upgrade to fail.

If you do configure purge scripts to run while Upgrade Assistant is running, you will see: "ORA-20099: ERROR The 11g to 12c Upgrade is in progress".

If you run UA while purge scripts are running, you will see: "SQLException: ORA-00054: resource busy and acquire with NOWAIT specified or timeout expired".

10.4 Using the Upgrade Administration Scripts

The upgrade administration scripts are included as part of the Upgrade Assistant functions provided with the SOA Suite 12c (12.2.1) installation. These PL/SQL scripts provide additional administrative control over the upgrade of instances. Once upgraded, the instances can be viewed from Oracle Enterprise Manager Console. If more detailed information is needed about the upgrade progress, then use the administration scripts for additional reporting and configuration options.

Note:

The administration upgrade scripts provide detailed information about the upgrade. These scripts provide additional configuration, administration, and monitoring functionality for your instance upgrade. You can configure these scripts to run (or not run) based on your own requirements.

The Fusion Middleware Control Console can also be used to administer and monitor the upgrade process, but you will have more administration options using the administration scripts.

Oracle recommends that you run the Report Upgrade Summary (Option 1) script after using the Upgrade Assistant to monitor Upgrade of closed instances.

For more information about using the Fusion Middleware Control Console to monitor the progress of the upgrade, see [Monitoring Upgrade Status with Fusion Middleware Control](#).

[Accessing the Upgrade Scripts Menu](#)
[Running the Administration Scripts](#)

10.4.1 Accessing the Upgrade Scripts Menu

There are several scripts that can be used to configure, administer and monitor your instance upgrade. These scripts can be accessed using the `soa_upgrade_menu` PL/SQL script.

To access the upgrade scripts menu:

1. Locate the `/admin` directory of the 12.2.1 SOA home.

For example:

```
cd <ORACLE_HOME>/soa/common/sql/soainfra/sql/oracle/121300/upgrade/admin
```

2. Use SQL* Plus to access the `_SOAINFRA` schema using the schema owner name and password.

For example:

```
sqlplus dev_soainfra/<welcome1>
```

where `dev` is the schema owner prefix you used when the `SOAINFRA` schema was created, and `welcome1` is the schema password.

Note:

If you attempt to access the administration scripts using a user other than `<prefix>_SOAINFRA`, you will encounter the following error message:

```
ERROR at line 24:
ORA-06550: line 24, column 3:
PLS-00201: identifier 'CONTROL_MIGRATION.UPGRADE_STATUS_INFO' must be
declared
```

3. Run the `soa_upgrade_menu.sql` script to see the upgrade administration options menu.

```

SQL> @soa_upgrade_menu.sql
=====
1: Report upgrade summary.
2: Report upgrade database sessions (Running sessions).
3: Report upgrade database background jobs (Completed jobs).
4: Report background control job parameters.
5: Change background control job execution schedule.
6: Enable/Disable background control job.
.
Advanced Options:
.
7: Change background control job parameters.
8: Stop upgrade database background sessions and jobs.
9: Reset errored llg instances.
10: Report Current job run log (Oracle Internal Use).
.
11: EXIT.
.
. (NOTE: for error SP2-0309, please restart menu)
.
Enter option :

*****
*****

```

[Table 10-1](#) describes the functionality of each script.

10.4.2 Running the Administration Scripts

The Administration Scripts Main Menu displays all of the options you have to monitor and administer the background control jobs and other administration tasks such as troubleshooting.

Caution:

The Advanced Options should only be used to troubleshoot the upgrade or to make changes to the upgrade process based on specific upgrade requirements. In most cases these scripts should only be executed by a designated system administrator or Oracle Support.

To run one of the administration scripts, enter an option number when prompted. [Table 10-1](#) describes the functionality of each script.

Table 10-1 Menu Options for Upgrade Administration Scripts

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
1	Report Upgrade Summary	View the overall status of the upgrade.	<p>The report is divided into sub-sections and provides an overview of the overall upgrade and the current run.</p> <p>The Report Upgrade Summary shows the upgrade summary for METADATA, OPEN ECIDS (open instances) and ALL ECIDS (closed instances). The upgrade status is either COMPLETE or OUTSTANDING (still running).</p> <p>In addition, it describes the following:</p> <ul style="list-style-type: none"> Last upgrade date for closed 11g instances The Maximum Upgrade Date for Closed 11g Instances section displays the closure date of the last upgraded flow. The upgrade starts with the most recently closed instances and continues until the oldest completed instance is upgraded. An instance flow that closed on January 1, 2014 would be upgraded before a flow that closed on December 1, 2013. A Maximum Upgrade Date of June 1, 2013 indicates that all closed instances up to June 1, 2013 have been upgraded and any instances that were closed before June 1, 2013 are still in the process of being upgrade. Upgrade error count The UPGRADE ERROR COUNT displays the number of errors that have occurred during the upgrade. You can use the <code>UPGRADE_ERRORS</code> file to determine the cause of the errors.

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
2	Report upgrade database sessions (Running sessions).	Determine which jobs are still running. Do NOT use this information to manually kill the jobs.	<p>The option will return running sessions data under 'Module', 'Inst', 'Sid' and 'Serial' columns. For example:</p> <pre> ===== ===== ===== Report Upgrade Database Sessions (Running) ===== ===== ===== . Module Inst Sid Serial --- -- -- ---- SOAUPGRADECONTROLMAIN 1 122 16535 SOAUPGRADEDATA_0 1 228 14557 SOAUPGRADEDATA_1 1 64 46683 SOAUPGRADEDATA_2 1 180 621 SOAUPGRADEDATA_3 1 130 61577 SOAUPGRADESUBMITJOBS 1 172 66 </pre> <p>Monitor job completion through the database scheduler job log.</p> <p>CAUTION: Do not use this information to stop the sessions. Use the administration script as described in Stopping Upgrade Sessions and Jobs.</p>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
3	Report upgrade database background jobs (Completed jobs).	Determine which jobs have completed the upgrade.	<p>The database sessions that perform the instance upgrades are executed as database jobs. Once the jobs are complete, the status can be viewed with this option. The user is not expected to understand what each job does, only to ensure that the status shows success without any errors.</p> <p>The report displays the control job parameter values, the submitted upgrade job, current status of the job (submitted, waiting, running) and the job thread number (if applicable).</p> <p>For example:</p> <pre> ===== ===== ===== Report Upgrade Database Background Jobs (Completed) ===== ===== ===== . . State of last 15 completed Jobs in descending order . Log_date Job_name Status ERROR ---- ---- --- ---- 21-FEB-2014 03:07:36 UPGRADE_SOA_METADATA_JO B SUCCEEDED 0 </pre>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
4	Report background control job parameters.	View the current background control job parameters.	<p>This option will report the parameters that are passed to the control job which coordinates the instance upgrade.</p> <pre> ===== ===== ===== Report Background Control Job Parameters ----- ----- BATCH_SIZE : 10000 MAX_COUNT : 100000 JOB_MAX_RUNTIME : 240 DOP : 4 METADATA_JOB_COMPLETE : TRUE OPEN_ECIDS_COMPLETE : FALSE DATA_JOB_COMPLETE : FALSE CTL_MAX_RUNTIME : 1 FIRST_TIME : FALSE FIRST_CTL_MAX_RUNTIME : 0 FIRST_JOB_MAX_RUNTIME : 0 SQL_TRACE : FALSE METRICS : TRUE ASYNC : TRUE ----- ENABLE : FALSE REPEAT INTERVAL : freq=daily; byhour=3; byminute=0; bysecond=0 </pre>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
5	Change background control job execution schedule.	Change the repeat interval time and duration of the background control job.	<p>By default, the background control job interval will start at 3AM (local time) and run for 4 hours (240 minutes) every day until all of the closed instances have been upgraded (set in terms freq=daily; byhour=3; byminute=0; bysecond=0). If you want this job to run at a different time, use this option to change the repeat interval.</p> <p>Change Background Control Job Execution Schedule - Repeat Interval =====</p> <p>The repeat interval determines when the control procedure is executed by the database scheduler. Examples of repeat intervals can be found in the Oracle Database Administrators Guide. Enter REPEAT INTERVAL:</p> <p>For more information, see Changing Background Control Job Execution Schedule (Option 5)</p> <p>NOTE: To change the duration of the run (default is 240 minutes), modify the JOB_MAX_RUNTIME using the Change Background Control Job Parameters (Option 7).</p>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
6	Enable/Disable background control job.	Enable or disable the background job.	<p>By default, the Enable/Disable background control job is disabled (ENABLE: FALSE). Enter Y (Yes) to change the current setting. Note that disabling the control job will prevent the background control job from running at the specified repeat interval. The setting will appear in the Summary Report as ENABLE: TRUE or FALSE.</p> <p>Enter N (No) to retain the current setting.</p> <pre> ENABLE/DISABLE CONTROL JOB SCHEDULE ===== ===== Disabling the Control Schedule will stop the Control job from executing at the specified Repeat Interval. Change ENABLE Y/N: </pre> <p>For more information, see Enabling and Disabling Background Control Job (Option 6)</p>

Advanced Options

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
7	Change background control job parameters.	<p>Change the BATCH_SIZE, MAX_COUNT, JOB_MAX_RUNTIME or DOP (degree of parallel (options 1-4)).</p> <p>Do not change the Advanced Options (options 5-14) unless instructed to do so by Oracle Support to troubleshoot an upgrade.</p>	<p>For most upgrades, the default values for the background control job parameters are sufficient. However, if you need to make changes, review the parameter descriptions in Setting Control Job Parameters (Option 7).</p> <p>1: Set BATCH_SIZE 2: Set MAX_COUNT 3: Set JOB_MAX_RUNTIME 4: Set DOP . Advanced Options: . (Options below for Oracle Internal Use) . (Please contact Oracle Support) . 5: Set METADATA_JOB_COMPLETE 6: Set DATA_JOB_COMPLETE 7: Set OPEN_ECIDS_COMPLETE 8: Set CTL_MAX_RUNTIME 9: Set FIRST_TIME 10: Set FIRST_CTL_MAX_RUNTIME 11: Set FIRST_JOB_MAX_RUNTIME 12: Set SQL_TRACE 13: Set METRICS 14: Set ASYNC . 15: MAIN MENU . Enter option :</p>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
8	Stop upgrade database background sessions and jobs.	Stop the current background database sessions or jobs.	<p>Use this option to gracefully stop the current background jobs or sessions as described in Stopping Upgrade Sessions and Jobs</p> <p>Stop Upgrade Database Background Sessions/ Jobs ===== ===== All upgrade sessions and jobs should stop but this may require 5 minutes to take affect.</p> <p>There will be a one minute wait before this procedure returns. Are you sure Y/N: Y Enter for MENU</p>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
9 Reset errored 11g instances.		Once an upgrade is run, check the upgrade_error_log and correct any reported errors. Then, use this option to resubmit those instances to process again in the next upgrade job.	<p>This option will enable the instances with errors to be processed again in the next upgrade job. Use this option only after you have corrected the errors reported in the upgrade_error_log.</p> <pre> Reset errored 11g instances ===== The 11g instances which have encountered an error will have their flow_id set to -1. This reset updates the flow_id back to null so they can be processed in the next exection of the background job. . The rows in the upgrade_error_log table will have their type column set to zero. The rows in this table are not removed so that history is not lost. . NOTE: Ensure to schedule and enable the background job. Are you sure Y/N: </pre>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
10 Report Current job run log (Oracle Internal Use).		Generate a report for Oracle Support that shows the parameters used in the current run.	<p>The output of this report can be sent to Oracle Support when troubleshooting an upgrade.</p> <p>You can also use this report to verify that any changes made to the Control Job Parameters are correct.</p> <p>Example:</p> <pre> ===== ===== ===== Report Current RUN log (Oracle Internal Use) ===== ===== ===== . Module Type Comment --- --- ----- CONTROL PARM batch_size => 10000 CONTROL PARM max_count => 100000 CONTROL PARM use_ctl_max_runtime => 0 CONTROL PARM use_job_max_runtime => 0 CONTROL PARM DOP => 4 CONTROL PARM metadata_job_complete => FALSE CONTROL PARM data_job_complete => FALSE CONTROL PARM open_ecids_complete => FALSE CONTROL PARM first_time => TRUE CONTROL PARM sql_trace => FALSE CONTROL PARM metrics => TRUE CONTROL PARM async => TRUE CONTROL PARM ctl_stoptime_d => NULL </pre>

Table 10-1 (Cont.) Menu Options for Upgrade Administration Scripts

Option Number	Scripts Name	Use this option to...	Description
11 Exit		Close the Script Administration Menu.	This option will close the menu.

10.5 Configuring the Administration Scripts

This section describes the steps needed to configure the upgrade administration scripts.

[Changing Background Control Job Execution Schedule \(Option 5\)](#)

[Enabling and Disabling Background Control Job \(Option 6\)](#)

[Setting Control Job Parameters \(Option 7\)](#)

[Resetting Errored 11g instances \(Option 9\)](#)

10.5.1 Changing Background Control Job Execution Schedule (Option 5)

Use Option 5 to change the execution schedule of the Background Control Job.

In the example below, the start time of the job was changed from 3AM to 4AM (local time).

```
Change Background Control Job Execution Schedule - Repeat Interval
=====
```

The repeat interval determines when the control procedure is executed by the database scheduler.

Examples of repeat intervals can be found in the Oracle Database Administrators Guide.

```
Enter REPEAT INTERVAL: freq=daily; byhour=4;
```

```
BEFORE Change : freq=daily; byhour=3;byminute=0; bysecond=0
AFTER Change  : freq=daily; byhour=4
```

10.5.2 Enabling and Disabling Background Control Job (Option 6)

Use the Enable/Disable Background Control Job script (Option 6) to enable the start of a background control job OR to prevent the start of a scheduled control job. T

Note:

The background control job is disabled by default (ENABLE : FALSE). If you manually enable the job (ENABLE : TRUE), then you must also manually disable it.

```
ENABLE/DISABLE CONTROL JOB SCHEDULE
=====
Disabling the Control Schedule will stop the Control job
```

from executing at the specified Repeat Interval.
Change ENABLE Y/N:

10.5.3 Setting Control Job Parameters (Option 7)

The Set Control Job Parameters script (option 7) can be used to configure the parameters described in [Table 10-2](#).

Table 10-2 Background Control Job Parameters

Parameter	Default	Description
BATCH_SIZE	10000	Determines the number of updates (inserts, updates and deletes) that are sent to the database at one time for execution.
MAX_COUNT	100000	Determines the number of instances (ECIDs) that are fetched to upgrade before another MAX_COUNT worth of instances is fetched.
JOB_MAX_RUNTIME	240 minutes (4 hours)	This is the maximum number of minutes that a background control job will run.
DOP	4	The number of parallel execution servers associated with a single operation is known as the degree of parallelism (DOP). Parallel execution is designed to effectively use multiple CPUs. CAUTION: Changing the degree of parallel is an advanced option. Refer to your database administration documentation for more information on setting the appropriate degree of parallelism for your deployment.
Advanced Options (for Oracle Internal Use only. Contact Oracle Support)		
SQL_TRACE	FALSE	NOTE: Setting SQL_TRACE to TRUE can be used to debug and troubleshoot, but it may require the DBA to grant "alter session" to the soainfra user as shown below: \$ sqlplus / as sysdba SQL> grant alter session to <soainfra>;

To Change the Job Control Parameters:

1. Launch the SOA Upgrade Menu using the steps in [Accessing the Upgrade Scripts Menu](#).

Enter 7 in the Enter option field to run the Change Background Control Job Parameters script.

The SOA Upgrade Menu is shown below:

```

=====
1: Report upgrade summary.
2: Report upgrade database sessions (Running sessions).
3: Report upgrade database background jobs (Completed jobs).
4: Report background control job parameters.
5: Change background control job execution schedule.
6: Enable/Disable background control job.
.
Advanced Options:
.
7: Change background control job parameters.
8: Stop upgrade database background sessions and jobs.
9: Reset errored llg instances.
10: Report Current job run log (Oracle Internal Use).
.
11: EXIT.
.
. (NOTE: for error SP2-0309, please restart menu)
.
Enter option :

*****
*****

```

2. Enter the number of the parameter you want to change in the **Enter Option** field.

For example, to change the BATCH_SIZE, enter 1.

A complete list of control job parameters is listed as shown below:

```

1: Set BATCH_SIZE
2: Set MAX_COUNT
3: Set JOB_MAX_RUNTIME
4: Set DOP
.
Advanced Options:
. (Options below for Oracle Internal Use)
. (Please contact Oracle Support)
.
5: Set METADATA_JOB_COMPLETE
6: Set DATA_JOB_COMPLETE
7: Set OPEN_ECIDS_COMPLETE
8: Set CTL_MAX_RUNTIME
9: Set FIRST_TIME
10: Set FIRST_CTL_MAX_RUNTIME
11: Set FIRST_JOB_MAX_RUNTIME
12: Set SQL_TRACE
13: Set METRICS
14: Set ASYNC
.
15: MAIN MENU
.
Enter option :

```

3. Change the value of the parameter by entering a new value. Click Enter to commit the change. Repeat this process for each parameter you want to change.

You can verify that the change was accepted by looking at the values in the Before Change and After Change fields.

4. Return to the Main Menu by entering 15 in the Enter Option field.

You will return to the main Administration Script menu.

```

=====
1: Report upgrade summary.
2: Report upgrade database sessions (Running sessions).
3: Report upgrade database background jobs (Completed jobs).
4: Report background control job parameters.
5: Change background control job execution schedule.
6: Enable/Disable background control job.
.
Advanced Options:
.
7: Change background control job parameters.
8: Stop upgrade database background sessions and jobs.
9: Reset errored 11g instances.
10: Report Current job run log (Oracle Internal Use).
.
11: EXIT.
.
. (NOTE: for error SP2-0309, please restart menu)
.
Enter option :

*****
*****

```

5. Verify that your changes have been made using the Report Background Control Job Parameters script (Option 4).

```

=====
Report Background Control Job Parameters
-----
BATCH_SIZE           : 10000
MAX_COUNT            : 100000
JOB_MAX_RUNTIME      : 240
DOP                  : 4
METADATA_JOB_COMPLETE : TRUE
OPEN_ECIDS_COMPLETE  : FALSE
DATA_JOB_COMPLETE    : FALSE
CTL_MAX_RUNTIME      : 1
FIRST_TIME           : FALSE
FIRST_CTL_MAX_RUNTIME : 0
FIRST_JOB_MAX_RUNTIME : 0
SQL_TRACE            : FALSE
METRICS              : TRUE
ASYNC                : TRUE
-----
ENABLE               : FALSE
REPEAT INTERVAL      : freq=daily; byhour=3; byminute=0; bysecond=0

```


10.5.4 Resetting Errored 11g instances (Option 9)

If the upgrade encountered errors during the run, resolve the issue(s) and then resubmit the errored instances by resetting the error flow_id from (-1) to null. The instances will be processed in the next scheduled background control job run.

For more information, see [Resolving Instance Upgrade Errors](#).

```
Reset errored 11g instances
```

```
=====
```

```
The 11g instances which have encountered an error will have their
flow_id set to -1. This reset updates the flow_id back to null
so they can be processed in the next execution of the background job.
```

```
.
```

```
The rows in the upgrade_error_log table will have their type column
set to zero. The rows in this table are not removed so that history
is not lost.
```

```
.
```

```
NOTE: Ensure to schedule and enable the background job.
```

```
Are you sure Y/N:
```

10.6 Stopping Upgrade Sessions and Jobs

You can use the administration scripts to stop a running session or job.

Note:

If you stop a running upgrade job before it has completed, you will not be able to query the remaining data or view it using Enterprise Manager Console.

The background jobs upgrade the newest instances first, so you can see how far the upgrade has progressed by looking at the timestamp of the last upgraded instance in the Upgrade Summary Report (Option 1) under the Maximum Upgrade Date for Closed 11g instances section.

There are two ways to stop the upgrade of read-only instances:

- Once the background database control job has started, use the Stop Upgrade Database Background Sessions and Job script (Option 8) to stop ALL of the upgrade sessions and jobs that are currently running. It can take a few minutes before all of the jobs have stopped.

```
Stop Upgrade Database Background Sessions/Jobs
```

```
=====
```

```
All upgrade sessions and jobs should stop but this may require 5 minutes to take
affect.
```

```
There will be a one minute wait before this procedure returns.
```

```
Are you sure Y/N: Y
```

```
Enter for MENU
```

Use the Report Upgrade Database Sessions (Option 2) to verify that there are no jobs running. You can restart the upgrade job, if needed, by scheduling a job to run at a user-defined time. This is the preferred method.

- Start a middle tier application, such as the SOA Managed Server.

Once a mid-tier application such as a managed server is started, the upgrade of closed instances is stopped automatically. You can use the administration scripts to schedule the upgrade job to run at another time.

10.7 Restarting an Incomplete Upgrade

If the instance upgrade is stopped, it must be manually restarted using the administration scripts as described below.

1. Enable the background control job using administration script option 6 - 'Enable/Disable background control job'.

See [Enabling and Disabling Background Control Job \(Option 6\)](#).

2. Schedule the background control job execution to run at specific time interval using administration script option 5 - 'Change background control job execution schedule'.

See [Changing Background Control Job Execution Schedule \(Option 5\)](#).

3. When the time interval specified in Step 2 is reached, the background control jobs starts. Monitor the upgrade status using the administration script option 1 'Report Upgrade Summary'.

See Option 1 in [Table 10-1](#).

4. Once the upgrade is completed, log in to Oracle Enterprise Manager Fusion Middleware Control, expand SOA, click **soa-infra** (soa_server1) and verify that the Data Migration Completed link is displayed under SOA Runtime Health section.

See [Verifying Data Migration is Complete](#).

10.8 Monitoring Upgrade Status with SQL Queries

This section provides SQL queries that can be used to monitor and validate upgrade in addition to the Administration Scripts.

To determine if...	Use this query	More Information
<p>A flow instance has encountered an error during upgrade (flowId is set to -1 or -2).</p>	<pre> Select count (*) from composite_instance where flow_id=-1; select count(*) from composite_instance where flow_id = -1; select count(*) from cube_instance where flow_id = -2 select count(*) from dlv_message where flow_id = -2; select count(*) from mediator_instance where flow_id = -2; </pre>	<p>Once Upgrade Assistant completes upgrading Open instances, Oracle recommends that you check for rows in UPGRADE_ERROR_LOG table within SOAINFRA schema. This table stores errored data that was not upgraded to 12c. The column 'type' determines the type of error encountered. The different type of error that can be reported in the UPGRADE_ERROR_LOG table:</p> <ul style="list-style-type: none"> • 0: These errors were reported in the previous upgrade run. Type will be set to 0 while 'Resetting Errored 11g instances (Option 9)' of the Upgrade Administrative Script is executed. • 1: Error occurred during the upgrade of instances. • 2: Error occurred during upgrade of EDN error event store or Adapter rejected messages. • 9: Error occurred during the upgrade of Metadata • 12: Generic error occurred during the data upgrade process. • <p>It is important to ensure that no errored records exist in these tables. For more information, see Resetting Errored 11g instances (Option 9)</p>
<p>All Open instances are upgraded.</p>	<pre> select count (*) from cube_instance where state < 5 and flow_id = -1; select count (*) from dlv_message where state in (0,1,4) and flow_id = -1 select count (*) from mediator_instance where component_state between 4 and 15 and flow_id is null; </pre>	<p>Run these queries post-upgrade to verify and they should return zero rows if all Open have been migrated.</p>

10.9 Monitoring Upgrade Status with Fusion Middleware Control

In addition to the administration scripts, you can also use the Oracle Enterprise Manager Fusion Middleware Control Console to view the general status of the

upgrade. The administration scripts will provide you with more administrative control of the upgrade jobs, but you can monitor the following with the Fusion Middleware Control Console:

Note:

If you need to perform advanced administration tasks for the upgrade, such as modifying the schedule or interval time of the upgrade, for example, you must use the administration scripts as described in [Using the Upgrade Administration Scripts](#).

[Verifying Data Migration is Complete](#)

[Managing an Incomplete \(Stopped\) Upgrade](#)

[Optimizing the Display of Instances in Enterprise Manager](#)

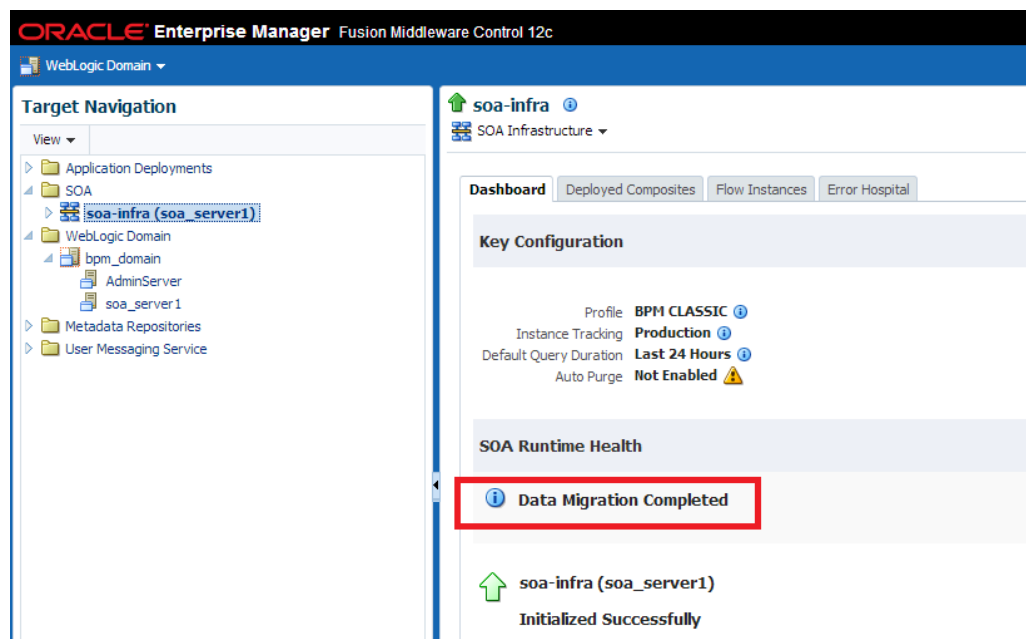
[Viewing Instances that Faulted During the Upgrade](#)

[Viewing Instances Created Prior to Composite Redeployment](#)

10.9.1 Verifying Data Migration is Complete

In the target navigation pane of Oracle Enterprise Manager Fusion Middleware Control, expand **SOA**, click **soa-infra (soa_server1)** and verify that the **Data Migration Completed** link is displayed under **SOA Runtime Health** section as shown below:

Figure 10-1 SOA Runtime Health: Data Migration Completed



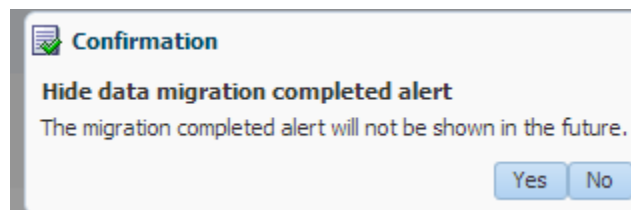
Click **Data Migration Complete** and verify that the following message is displayed:

Figure 10-2 Migration Completed

Click **OK** to close the Migration Completed dialog box. You will see the SOA Runtime Health migration status message (Figure 10-3).

Figure 10-3 SOA Runtime Health: Migration Status Message

Click **Close this message**. The following confirmation dialog appears:

Figure 10-4 Hide Data Confirmation

Click **Yes** to hide the data migration completed alert. The **Close the message** button will disappear from the SOA Runtime Health section.

Click **No** to retain the alert in the SOA Runtime Health section.

10.9.2 Managing an Incomplete (Stopped) Upgrade

You can use Fusion Middleware Control to manage an incomplete upgrade, which can occur in the following situations:

- None of the open or closed instances are upgraded.
- Some of the open instances have upgraded. For example, if you stop the background control job manually using administration script option 8 (Stop upgrade database background sessions and jobs) during the upgrade of open instances.
- Only open instances have been upgraded.
- Some or none of the closed instances have been upgraded.

Note:

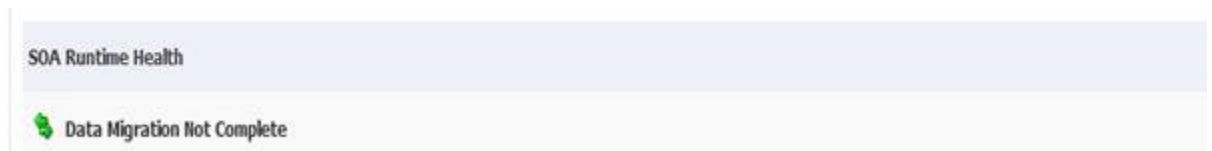
If you start the SOA managed servers before the instance upgrade is complete, Fusion Middleware Control will show the upgrade status as Data Migration Not Complete and you will have to manually restart the upgrade as described in [Restarting an Incomplete Upgrade](#).

If the upgrade is not yet complete, Fusion Middleware Control can provide the maximum creation date for all 11g instances that have not yet been upgraded. This is important because the maximum creation date can also help you determine why some instances might not be visible in the 12c Enterprise Manager Console. For example, if you notice that some older 11g closed instances are not visible in the Fusion Middleware Control console, you can check the maximum creation date for all non-upgraded instances to help you determine if its because the upgrade has not reached those instances yet.

To verify the status of an incomplete (stopped) upgrade using Middleware Control do the following:

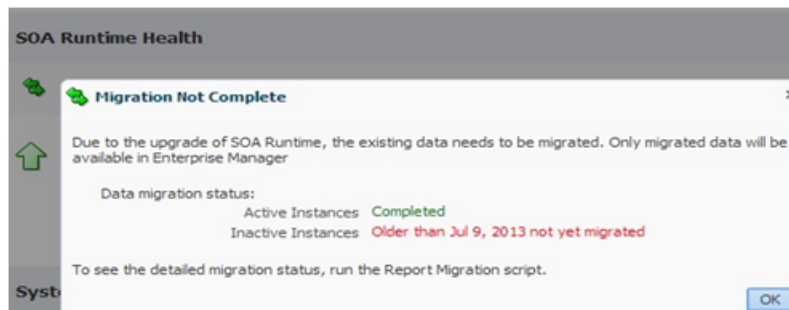
In the target navigation pane of Oracle Enterprise Manager Fusion Middleware Control, expand **SOA**, click **soa-infra (soa_server1)**. In the SOA Runtime Health section of the screen you will see the current status of the upgrade. For an incomplete upgrade, the status will be **Data Migration Not Complete**. You can refresh this screen every 5 minutes.

Figure 10-5 SOA Runtime Health: Data Migration Not Complete



Click **Data Migration Not Complete** and the following message is displayed:

Figure 10-6 SOA Runtime Health: Migration Not Complete Status Message



Data Migration Status:

- **Active Instances:** Shows the status of upgraded open instances. In the example above, the open instances have already been upgraded (status will be *Completed*).
- **Inactive Instances:** Shows the status of upgraded closed instances. In the example above, closed instances older than July 9, 2013 have not yet been upgraded. The upgrade is performed newest to oldest. Any instances that have not yet been upgraded will not appear in any Fusion Middleware Control reports or views. You can refresh the report every 5 minutes.

Note:

For a detailed report of the running upgrade, run the Report Upgrade Summary script (Option 1) as described in [Running the Administration Scripts](#).

Once all the closed instances are upgraded, the link will change to **Data Migration Completed** as shown in [Figure 10-2](#).

10.9.3 Optimizing the Display of Instances in Enterprise Manager

If your upgrade includes migrating a large number of instances (closed and open), you may experience performance issues when loading Enterprise Manager flow trace. To prevent performance degradation, create an index as described in the following steps:

1. Stop the Administration Server and any running managed servers.
2. Connect to SOAINFRA schema from SQLPLUS and execute the following command:

```
CREATE INDEX CI_FLOW_ID ON CUBE_INSTANCE(FLOW_ID);
```

3. Restart the Administration Server and managed servers.

10.9.4 Viewing Instances that Faulted During the Upgrade

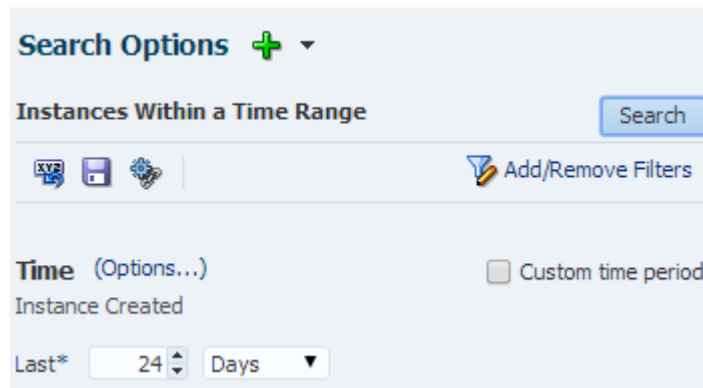
The 11g instances that incur a fault and fail during the upgrade can be seen only at the composite level post-upgrade. These instances will not be displayed at the partition level.

To view these instances, navigate to the **Flow Instances** tab of the deployed composite as shown in [Figure 10-7](#):

Figure 10-7 Using the composite level to view instances that faulted during upgrade

Flow ID	Initiating Composite	Flow State	Created	Last Updated
14003	bpel-101-HelloWorld [1.0]	Completed	Jun 9, 2014 2:04:00 PM	Jun 9, 2014 2:04:00 PM
14002	bpel-101-HelloWorld [1.0]	Failed	Jun 9, 2014 2:03:23 PM	Jun 9, 2014 2:03:23 PM
14001	bpel-101-HelloWorld [1.0]	Completed	Jun 9, 2014 12:51:57 PM	Jun 9, 2014 12:51:58 PM
3040	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:59 PM	Jun 5, 2014 4:50:59 PM
3039	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:59 PM	Jun 5, 2014 4:50:59 PM
2034	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:49 PM	Jun 5, 2014 4:50:49 PM
2033	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:49 PM	Jun 5, 2014 4:50:49 PM
35	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:29 PM	Jun 5, 2014 4:50:29 PM
34	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:29 PM	Jun 5, 2014 4:50:29 PM
33	bpel-101-HelloWorld [1.0]	Failed	Jun 5, 2014 4:50:29 PM	Jun 5, 2014 4:50:29 PM

NOTE: Use **Search Options** to specify a specific instance creation time or date range.

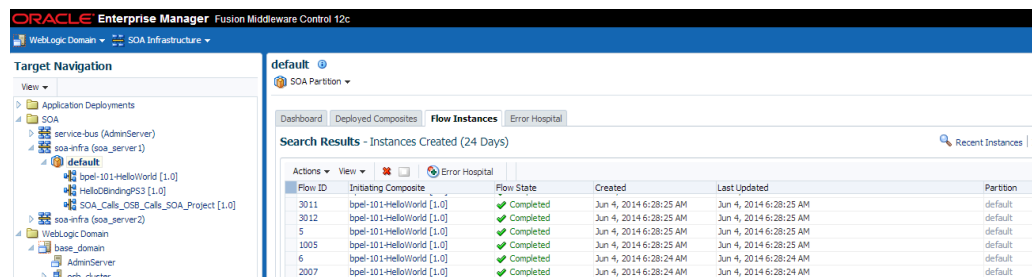


10.9.5 Viewing Instances Created Prior to Composite Redeployment

If a composite is redeployed with the same pre-upgrade revision, then you must navigate to the partition level (instead of composite level) to view these instances as shown in [Figure 10-8](#).

Instances created after the upgrade, however, can be viewed in the 12c composite level.

Figure 10-8 Using the partition level to see instances created prior to upgrade



10.10 Resolving Instance Upgrade Errors

If the upgrade fails or the `UPGRADE_ERROR_COUNT` section of the Report Upgrade Summary report (Option 1) shows that there were errors in the current run, you must resolve the errors before resubmitting the instances to upgrade.

The `upgrade_error_log` can be used to diagnose the error situation and may provide guidance on how to resolve the issue. For more information on resolving common upgrade errors, see [Recovering From a Failed Upgrade](#).

The table below describes each of the errors and possible resolutions:

Error Type	Description	Error Message	Resolution
0	<p>These errors were reported in the previous upgrade run.</p> <p>Type will be set to 0 after resetting the errored instances as described in Resetting Errored 11g instances (Option 9).</p>	<p>Error message giving details about error occurred based on previous error type.</p>	<p>Correct the errors from the previous run and reset using Administrative Script.</p>

Error Type	Description	Error Message	Resolution
1	Error occurred during the upgrade of instances.	The error message will have actual error thrown from the Upgrade script. It will also show a stack trace which will point out the line in the Upgrade PL/SQL script where the error has occurred.	Debugging the root cause can be done by looking at the actual error along with the trace to get the location of the error. ECID populated in the info column will be helpful in getting the data for failed instance.
2	Error occurred during upgrade of EDN error event store or Adapter rejected messages.	The error message will contain the string <code>upgrade_rejected_message/upgrade_edn_message</code> to determine which component it failed. It will contain the reason for failure along with the id of the message which failed.	Debugging can be done by analyzing the actual reason of the error. To get the details of the adapter/edn message which has failed the id logged as part of <code>ERROR_MSG</code> can be used.
9	Error occurred during the upgrade of metadata.	It will have details of the <code>composite_dn</code> for which the metadata upgrade has failed. It will have the actual error thrown from Upgrade script also with a stack trace which will point out the line in the Upgrade PL/SQL script where the error has occurred.	Debugging can be done by looking at the actual error along with the trace to get the location of the error. Info column will give the whole <code>composite_dn</code> for which the metadata upgrade has failed.
12	Generic error occurred during the data upgrade process and not pertaining to any single instance.	Info will only contain the string <code>migrate_soa</code> . It will have the actual error thrown from Upgrade script also with a stack trace which will point out the line in the Upgrade PL/SQL script where the error has occurred.	This error type will be reported during upgrade run when the data upgrade as a whole fails and not necessarily pertaining to any particular instance. An example of this type of error may be the TEMP table space issue.

10.11 Restarting a Failed Upgrade

Once the errors have been resolved, use the following steps to restart the upgrade:

1. Fix the error condition(s) displayed in the `upgrade_error_log`.
2. Remove the error flags from the `upgrade_error_log` as described in [Resetting Errored 11g instances \(Option 9\)](#). This will allow the errored instances to be resubmitted in a subsequent run.

3. Enable the background control job as described in [Enabling and Disabling Background Control Job \(Option 6\)](#). You will have to trigger another upgrade run.
4. If necessary, change the repeat interval time and duration of the background control job as described in [Changing Background Control Job Execution Schedule \(Option 5\)](#).
5. Monitor the upgrade status using the Report Summary Upgrade script (Option 1). The `UPGRADE ERROR COUNT` section of the report should show 0 errors. If errors persist, resolve the issue and repeat these steps.

Troubleshooting the Upgrade

This appendix describes some common procedures for troubleshooting a failed upgrade, domain reconfiguration or server start issues.

[Reviewing the Release Notes](#)

[Resolving Server Start Errors](#)

[Recovering From a Failed Upgrade](#)

[OWSM Data Source Connection Failure During Upgrade \(12.1.3 to 12.2.1\)](#)

When you select **All configurations used by the domain** when running the Upgrade Assistant, the upgrade fails at the examination phase with the WSMERROR-00015 error.

[Troubleshooting a Failed BAM Upgrade](#)

[Reapplying an EDN Topic to SOA JMS Module After Upgrade](#)

EDN Topic is not found when starting SOA Server post upgrade. This is a known issue and the workaround is to re-create the EDN Topic manually.

[Troubleshooting Oracle Service Bus](#)

[Troubleshooting Oracle Managed File Transfer \(MFT\) Upgrade Issues](#)

If you encounter an upgrade error while upgrading Oracle Managed File Transfer, refer to these troubleshooting tasks to correct the issue.

[Error Starting OWSM After Upgrading to 12c](#)

[Encryption Issues During Upgrade](#)

[Upgrading Unsupported Domains with the Upgrade Assistant](#)

[Business Rules Audit Trail Not Showing After Instance Upgrade](#)

[Resolving a Coherence Cache Exception](#)

[WSDL Generated Missing Elements for Custom Exception](#)

[Connecting to the ServerSocket through Remote Clients](#)

A.1 Reviewing the Release Notes

Make sure that you review the release notes to determine if any known issues could be impacting your upgrade. You can find the release notes in the Oracle Fusion Middleware 12c (12.2.1) library.

A.2 Resolving Server Start Errors

If servers do not start, or they start in AdminMode, the cause is most likely that the `setDomainEnv.sh` changes from the previous environment were not reapplied to the 12c domain. Compare the `setDomainEnv` file from 11g to the new 12c `setDomainEnv` file and then add any custom changes after the upgrade.

For more information, see "Re-apply Customizations to Startup Scripts".

A.3 Recovering From a Failed Upgrade

Recovering from a failed upgrade depends on when the error(s) occurred. Review the following to determine how to recover:

- If there are errors while running the Upgrade Assistant to upgrade `_SOAINFRA` schema, you must fix the errors in the schema and rerun batch jobs.

Note that this recovery method only applies when you are running the Upgrade Assistant for the first time and you selected the Schema option.

- If there are errors while running the Reconfiguration Wizard, you must restore from source environment and restart the upgrade from the beginning.
- If there are errors while running the Upgrade Assistant to upgrade WebLogic Component Configurations option, then you can fix the errors and rerun the Upgrade Assistant. The second time you run the Upgrade Assistant there is no need to restore from backup and restart the upgrade process from the beginning. This process is reentrant.
- If there are errors while running the Upgrade Assistant to upgrade schemas, and the error occurs during the upgrade phase, you will have to restore from backup, correct the issues, and then restart the upgrade from the beginning. If the error occurs during the examine phase, however, you can correct the issues and restart the Upgrade Assistant. Errors that occur prior to the upgrade phase are reentrant.

For more information on troubleshooting your upgrade, see "General Troubleshooting Guidelines" in the *Upgrading with the Upgrade Assistant*.

Note:

If you received the **CFGFWK-60950** error, rename the BAM templates as described in "[Renaming the Oracle BAM Templates Before Upgrading the 11g Schemas](#)" and launch the Reconfiguration Wizard again.

If you received this error, you will need restore your entire pre-upgrade environment, perform the necessary pre-upgrade tasks and then perform the steps in the section listed above before you can attempt the reconfiguration process again.

For more information on resolving BAM-specific issues, see [Recovering from a Failed Oracle BAM Upgrade](#).

A.4 OWSM Data Source Connection Failure During Upgrade (12.1.3 to 12.2.1)

When you select **All configurations used by the domain** when running the Upgrade Assistant, the upgrade fails at the examination phase with the WSMERROR-00015 error.

Error Message:

```
[2015-09-22T10:46:54.552-07:00] [WSM] [INCIDENT_ERROR]
[upgrade.WSM.WSMPLUGIN]oracle.ias.update.exception.UpgradeExcept
ion: WSMERROR-00015: Failed to read the Oracle WSM datasource
connection details.at
oracle.wsm.lifecycle.upgrade.impl.WSMUpgradePlugin.initializePlu
ginData(WSMUpgradePlugin.java:396)
```

This error occurs because the 12.1.3 domain is created with Multi-DataSource connection. When upgrading to 12.2.1, the Upgrade Assistant expects a generic datasource connection.

To perform the upgrade, complete the following steps:

1. Change the "mds-owsm" data source to be a generic data source.
2. Restart the Upgrade Assistant and, when prompted, select All configurations used by the domain.
3. After a successful upgrade, you can change the "mds-owsm" data source back to a multi-DS.

A.5 Troubleshooting a Failed BAM Upgrade

When upgrading a domain containing Oracle Business Activity Monitoring (BAM), note that there are additional BAM-specific troubleshooting procedures.

For more information, see [Recovering from a Failed Oracle BAM Upgrade](#).

A.6 Reapplying an EDNTopic to SOA JMS Module After Upgrade

EDN Topic is not found when starting SOA Server post upgrade. This is a known issue and the workaround is to re-create the EDN Topic manually.

After upgrading to SOA 12.2.1, the upgraded SOA JMS module may be missing the EDNTopic. If the JMS module is missing the EDNTopic, you must manually add the topic or UDD for this topic using the Administration Console or WLST.

This is a known issue and can occur in both clustered and unclustered environments.

See the Administration Console online help for more information on reapplying the EDNTopic or contact Oracle Support.

A.7 Troubleshooting Oracle Service Bus

If you experience post-upgrade issues with Oracle Service Bus, review the troubleshooting procedures described in [Troubleshooting Oracle Service Bus Upgrade](#).

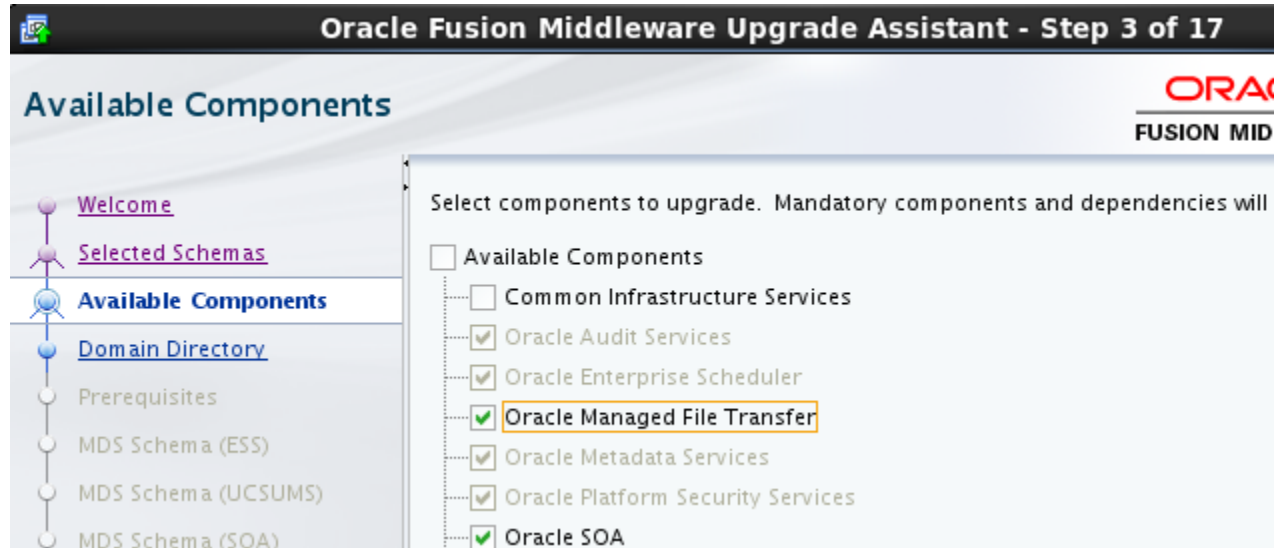
A.8 Troubleshooting Oracle Managed File Transfer (MFT) Upgrade Issues

If you encounter an upgrade error while upgrading Oracle Managed File Transfer, refer to these troubleshooting tasks to correct the issue.

Some common upgrade error messages for Managed File Transfer are listed below:

SQLException: ORA-04020: deadlock detected while trying to lock object

Resolution: Make sure that you selected Managed File Transfer on the Available Components screen of the Upgrade Assistant. If you do not select Oracle Managed File Transfer, the upgrade will not include MFT schema.



A.9 Error Starting OWSM After Upgrading to 12c

If there was a custom trust keystore configured in Enterprise Manager 11g prior to the upgrade, you may encounter issues with starting the OWSM.

Specifically, if after upgrading an 11g domain running OWSM to 12c, you receive the following error in the OWSM server log (after the second startup), then you must manually correct this issue:

```
####<Dec 18, 2014 12:07:01 PM MST> <Error> <HTTP> <srvgdysoap01.nov.com> <wls_wsml>
<[STANDBY] ExecuteThread: '3' for queue: 'weblogic.kernel.Default (self-tuning)'>
<<WLS Kernel>> <> <26c804bb-15a7-46de-a81e-82565fcd2f28-00000004> <1418929621034>
<BEA-101216> <Servlet: "PolicyManagerValidator" failed to preload on startup in Web
application: "/wsm-pm".
```

```
Stack:
java.lang.NullPointerException
at
oracle.wsm.config.ConfigurationProcessor.isContextValid(ConfigurationProcessor.java:
297)
at
weblogic.security.acl.internal.AuthenticatedSubject.doAs(AuthenticatedSubject.java:
321)
at weblogic.security.service.SecurityManager.runAs(SecurityManager.java:120)
```

If wsm-pm application will not start, you must perform the following steps:

1. Roll back the upgrade to 11g

2. Run through the upgrade steps again using the Upgrade Assistant.
3. Start the OWSM server

Note:

It is very important to only start the OWSM server once and leave it running. If you stop and restart it then the NPE will present itself and you will have to roll back again

4. Execute the following WLST command against the running OWSM server from the <domain_home>/oracle_common/common/bin location:

```
exportMetadata('wsm-pm','<wsm server>','location to write the zip')
```

where <wsm_server> is the name of the WLS server running OWSM ('wsm_server1' for example)

5. Extract the MDS archive and go to /configuration/WLS/ and open the file there. The file name is the name of the domain.
6. Search for the property entries containing the string 'keystore.inst.0'. There are probably several of them in a row and they look like

```
<orares:property .....</orares:property>
```

7. Delete these properties from the file.
8. Rebuild the archive and import it back to the running server with the command:

```
importMetadata('wsm-pm','<wsm server>','location of zip')
```

9. Restart the servers.

A.10 Encryption Issues During Upgrade

If you received the following error message during the reconfiguration, you may need to apply additional policy files to the JDK and restart the upgrade from your backup:

```
JPS-06513: Failed to save keystore. Reason
oracle.security.jps.service.keystore.KeyStoreServiceException:
Failed to perform cryptographic operation
```

To prevent this error from reoccurring, apply the policy files before the subsequent upgrade using the information in Using Enhanced Encryption (AES 256).

A.11 Upgrading Unsupported Domains with the Upgrade Assistant

If you receive an error from the Upgrade Assistant stating that the specified domain cannot be upgraded, contact Oracle Support for more information. Supported domain configurations are described in [Understanding SOA Domain Upgrade Restrictions](#).

Do not attempt to upgrade or schemas or domain configurations in an unsupported domain.

A.12 Business Rules Audit Trail Not Showing After Instance Upgrade

The audit trail for upgraded 11g instances of the Decision Service Component will not be available post-upgrade. The audit trail for new 12c instances will continue to display.

A.13 Resolving a Coherence Cache Exception

If you see the following WebLogic Cache Provider Coherence exception then it is likely that you are not following an enterprise deployment topology recommendation to specify a specific ListenAddress.

When you see this exception, you must set the ListenAddress for your managed server as shown below:

Exception:

```
weblogic.cacheprovider.coherence.CoherenceException:  
    at  
weblogic.cacheprovider.coherence.CoherenceClusterManager.ensureWKAAddresses(Coherence  
ClusterManager.java:510)  
    at  
weblogic.cacheprovider.coherence.CoherenceClusterManager.configureClusterService(Cohe  
renceClusterManager.java:236)  
    at  
weblogic.cacheprovider.CacheProviderServerService.bootCoherenceFromWLSCluster(CachePr  
oviderServerService.java:225)  
    at  
weblogic.cacheprovider.CacheProviderServerService.initCoherence(CacheProviderServerSe  
rvice.java:94)
```

Resolution:

1. Log in to the WebLogic Server Console.
2. Navigate to **Servers**.
3. Locate the **Managed Servers** (SOA or OSB, for example).
4. Modify the Listen Address from localhost to 127.0.0.1 or provide the actual machine name.

A.14 WSDL Generated Missing Elements for Custom Exception

If your EJBs contain custom exceptions, and you export the Web Service Description Language (WSDL) file from your EJB business service, the generated WSDL file will not have the custom exception properties in it. You will need to manually edit the WSDL file to include these custom exception properties after the upgrade.

The issue is limited only to the WSDL generation part of the file. During runtime, the custom exception thrown from the EJB will be mapped to the respective elements in the SOAP fault. The response payload will have the elements populated corresponding to the properties of the custom exception.

A.15 Connecting to the ServerSocket through Remote Clients

There is a change in behavior in which the ServerSocket is created when you upgrade from Oracle Release 11g to Release 12g. Because of this, remote clients might not able

to connect to the ServerSocket when the hostname is configured as *localhost*. As a workaround, the *localhost* should be changed to *hostname*.

For more information, see "Configuring Oracle Socket Adapter" *Understanding Technology Adapters*.

