Oracle® Fusion Middleware

Upgrading Oracle HTTP Server

12*c* (12.2.1.3)

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Oracle Fusion Middleware Upgrading Oracle HTTP Server, 12*c* (12.2.1.3)

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Preface

This preface contains the following sections:

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  Upgrade documentation is organized by tasks in the 12*c* documentation library. The task-specific pages provide direct links to common upgrade procedures and related documentation.
- Conventions

Audience

This manual is intended for Oracle Fusion Middleware system administrators who are responsible for upgrading Oracle Fusion Middleware. It is assumed that the readers of this manual have knowledge of the following:

- Oracle Fusion Middleware 11*g* or Oracle Fusion Middleware 12*c* system administration and configuration information for the existing deployment
- The configuration and expected behavior of the system or systems being upgraded

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at `https://www.oracle.com/corporate/accessibility/`.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit `https://support.oracle.com/portal/` or visit `Oracle Accessibility Learning and Support` if you are hearing impaired.

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle respects and values having a diverse workforce that increases thought leadership and innovation. As part of our initiative to build a more inclusive culture that positively impacts our employees, customers, and partners, we are working to remove insensitive terms from our products and documentation. We are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is ongoing and will take time and external cooperation.

Related Documents

Upgrade documentation is organized by tasks in the 12*c* documentation library. The task-specific pages provide direct links to common upgrade procedures and related documentation.

You can refer the Oracle Fusion Middleware Library for additional information.

- For installation information, see Fusion Middleware Installation Documentation.
- For upgrade information, see Fusion Middleware 12*c* Upgrade Documentation.
- For administration-related information, see Fusion Middleware 12*c* Administration Documentation.
- For release-related information, see Fusion Middleware 12*c* Release Notes.

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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	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 standalone Oracle HTTP Server and provides pointers to additional information.

- New and Changed Features for 12c
- Other Significant Changes in this Document for 12c

New and Changed Features for 12*c*

Before you begin the upgrade process, review the following list of changes for standalone Oracle HTTP Servers in 12*c*:

- The installer no longer creates a separate instance directory for Oracle HTTP Server. Instance information for the standalone OHS is stored in a new **standalone domain** home. See Oracle HTTP Server Standard Upgrade Topology for Standalone Agents not Associated with a WebLogic Domain.
- The OPMN agent and `opmnctl` command-line utilities are no longer used in Oracle Fusion Middleware. Instead, system components are managed by NodeManager and WLST commands.

Other Significant Changes in this Document for 12*c*

Support for Certificates signed with MD5 algorithm has been removed. See Replacing Certificate Signed Using MD5 Algorithm with Certificate Signed Using SHA-2 Algorithm.

1 Introduction to Upgrading Oracle HTTP Server to 12*c* (12.2.1.3.0)

Before you begin, review all introductory information to understand the standard upgrade topologies and upgrade paths for Oracle HTTP Server 12*c* (12.2.1.3.0)

- About the Starting Points for an Oracle HTTP Server Upgrade
  You can upgrade to Oracle HTTP Server 12*c* (12.2.1.3.0) from supported 11*g* and 12*c* releases.
- About the Oracle HTTP Server Standard Topologies
  The steps to upgrade Oracle HTTP Server to 12*c* (12.2.1.3.0) depend on the existing production topology (either 11*g* or a previous 12*c* release).
- Differences between Oracle HTTP Server 11g and 12c
  There are a few key differences to be aware of before you upgrade your Oracle HTTP Server to this release of Oracle Fusion Middleware.
- About Upgrade Restrictions
  If you are using two or more Oracle Fusion Middleware products of the same or different versions in a single, supported, Oracle Fusion Middleware configuration, you must consider the interoperability and compatibility factors before planning the upgrade.
- How to use this Guide
  The procedure to upgrade Oracle HTTP Server is determined by whether it's a standalone deployment or a managed deployment.
- Determining whether Oracle HTTP Server is Standalone or Managed (Collocated)

About the Starting Points for an Oracle HTTP Server Upgrade

You can upgrade to Oracle HTTP Server 12*c* (12.2.1.3.0) from supported 11*g* and 12*c* releases.

Supported release starting points are:

- Oracle HTTP Server 11*g* Release 1 (11.1.1.7, 11.1.1.8, and 11.1.1.9)
- Oracle HTTP Server 12*c* (12.1.2.0.0, 12.1.3.0.0, 12.2.1.0.0, 12.2.1.1.0, and 12.2.1.2.0)

The upgrade procedures in this guide explain how to upgrade an existing Oracle HTTP Server 11*g* domain and an existing 12*c* domain to Oracle Fusion Middleware 12*c* (12.2.1.3.0).

About the Oracle HTTP Server Standard Topologies

The steps to upgrade Oracle HTTP Server to 12*c* (12.2.1.3.0) depend on the existing production topology (either 11*g* or a previous 12*c* release).

As a result, it is difficult to provide exact upgrade instructions for every possible Oracle HTTP Server installation. Therefore, this upgrade documentation provides instructions for upgrading several typical Oracle HTTP Server topologies. These typical topologies are referred to as *standard upgrade topologies*.

Your actual topology may vary, but the topologies described here provide an example that can be used as a guide to upgrade other similar Oracle HTTP Server topologies.

> **Note:**
>
> For additional information about the upgrade process and planning resources to ensure your upgrade is successful, see Preparing to Upgrade in *Planning an Upgrade of Oracle Fusion Middleware*.

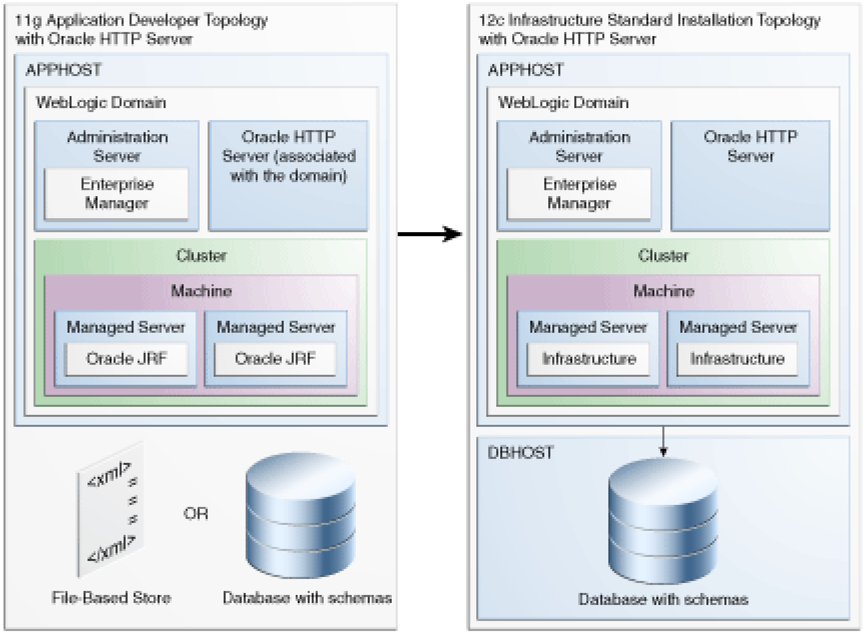
If you are upgrading from a previous 12*c* release, the standard topology remains unchanged. If you are upgrading from 11*g*, refer to the following sections to upgrade the following specific topologies:

- Fusion Middleware Infrastructure Upgrade Topology with Oracle HTTP Server
  This topic contains the Oracle Fusion Middleware 11*g* Application Developer standard upgrade topology with Oracle HTTP Server and the resulting Oracle Fusion Middleware 12*c* Infrastructure topology as it appears after you complete the upgrade procedures in this guide.

Fusion Middleware Infrastructure Upgrade Topology with Oracle HTTP Server

This topic contains the Oracle Fusion Middleware 11*g* Application Developer standard upgrade topology with Oracle HTTP Server and the resulting Oracle Fusion Middleware 12*c* Infrastructure topology as it appears after you complete the upgrade procedures in this guide.

Figure 1-1 Infrastructure Standard Upgrade Topology with Oracle HTTP Server



Most of the elements in Figure 1-1 are described in Table 1-1.

Table 1-1 Description of the Elements in the Infrastructure Standard Upgrade Topology with Oracle HTTP Server

Element	Description and Links to Additional Documentation
11*g* Application Developer Topology with Oracle HTTP Server	This is the label for the left side of Figure 1-1. It shows a typical single-host topology created using the Oracle Fusion Middleware 11*g* Application Developer installer. It consists of a single domain that contains a cluster of two managed servers and the Administration Server. It also has an optional file-based store or database with schemas. Figure 1-1 also shows an Oracle HTTP Server instance as part of the 11*g* domain. This document describes, step-by-step, how to upgrade this topology to an equivalent topology created by using the Oracle Fusion Middleware 12*c* Infrastructure distribution.
12*c* Infrastructure Standard Installation Topology with Oracle HTTP Server	This is the label for the right side of the figure. It shows a typical single-host topology created by using the Oracle Fusion Middleware 12*c* Infrastructure distribution. Like the Application Developer 11*g* topology, it also consists of a single domain that contains a cluster of two managed servers and the Administration Server. Figure 1-1 also shows an Oracle HTTP Server instance as part of the 12*c* domain.
Oracle HTTP Server *associated with the domain*	An Oracle HTTP Server 11*g* instance that is configured to be *associated with* the Oracle WebLogic Server domain. In Oracle Fusion Middleware 11*g*, system component instance, such as Oracle HTTP Server, are configured with an Oracle Universal Installer-based configuration wizard and are managed using Oracle Process Manager and Notification Server.
Oracle HTTP Server	Unlike the Oracle HTTP Server 11*g* instance in the left side of the diagram, the Oracle HTTP Server 12*c* instance shown in the 12*c* topology is configured as part of the domain using the Oracle Fusion Middleware Configuration Wizard. It is managed using Oracle Enterprise Manager Fusion Middleware Control, the Oracle WebLogic Scripting Tool (WLST), and the Oracle WebLogic Server Node Manager software.

- Oracle HTTP Server Standard Upgrade Topology for Standalone Agents not Associated with a WebLogic Domain
  In 12*c*, a **Standalone Oracle HTTP Server** is not managed by or associated with an Oracle WebLogic Server domain. A standalone Oracle HTTP Server 12*c* topology is installed and configured without the Oracle Fusion Middleware Infrastructure. A **Managed Oracle HTTP Server**, however, is associated with an existing Oracle WebLogic Server domain. For the standalone scenario, you install the Oracle HTTP Server software in its own Oracle home, and you configure the Oracle HTTP Server instance in its own **standalone domain**.

Oracle HTTP Server Standard Upgrade Topology for Standalone Agents not Associated with a WebLogic Domain

In 12*c*, a **Standalone Oracle HTTP Server** is not managed by or associated with an Oracle WebLogic Server domain. A standalone Oracle HTTP Server 12*c* topology is installed and configured without the Oracle Fusion Middleware Infrastructure. A **Managed Oracle HTTP Server**, however, is associated with an existing Oracle WebLogic Server domain. For the standalone scenario, you install the Oracle HTTP Server software in its own Oracle home, and you configure the Oracle HTTP Server instance in its own **standalone domain**.

> **Note:**
>
> - For more information on installing and configuring a standalone Oracle HTTP Server, see About Oracle HTTP Server Installation in *Installing and Configuring Oracle HTTP Server*.
> - For more information on the latest 12*c* standalone domain, see What Is a Standalone Domain? in *Understanding Oracle Fusion Middleware*.
> - For more information on the administration scenarios and key features of the Oracle HTTP Server, see Introduction to Oracle HTTP Server *Administrator's Guide for Oracle HTTP Server*.
> - For more information on upgrading a managed Oracle HTTP Server, see Performing the Infrastructure Upgrade in *Upgrading to the Oracle Fusion Middleware Infrastructure*.

Figure 1-2 shows a standalone Oracle HTTP Server topology.

Figure 1-2 Standalone Oracle HTTP Server Upgrade Topology

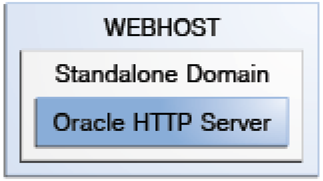


Table 1-2 describe the elements of this topology

Table 1-2 Description of the Elements in the Oracle Fusion Middleware Standalone Oracle HTTP Server Upgrade Topology

Element	Description and Links to Additional Documentation
WEBHOST	Standard term used in Oracle documentation thatrefers to the computer that hosts the Web tier.

Table 1-2 (Cont.) Description of the Elements in the Oracle Fusion Middleware Standalone Oracle HTTP Server Upgrade Topology

Element	Description and Links to Additional Documentation
Standalone Domain	A standalone domain is only created if you are upgrading from 11*g* to 12*c*. If you are upgrading from 12.1.2.0.0, 12.1.3.0.0, 12.2.1.0.0, 12.2.1.1.0, and 12.2.1.2.0, then the standalone domain already exists and there is no need to create the standalone domain. The standalone domain has a directory structure similar to an Oracle WebLogic domain, but it does not contain an Administration Server or Managed Servers. The Oracle WebLogic Server Node Manager and other tools allow you to manage the standalone Oracle HTTP Server instance. See What Is a Standalone Domain? in *Understanding Oracle Fusion Middleware*.

Differences between Oracle HTTP Server 11*g* and 12*c*

There are a few key differences to be aware of before you upgrade your Oracle HTTP Server to this release of Oracle Fusion Middleware.

Table 1-3 lists the key differences between Oracle HTTP Server 11*g* and 12*c*.

Table 1-3 Differences between Oracle HTTP Server 11*g* and 12*c*

In Oracle HTTP Server 11*g*:	In Oracle HTTP Server 12*c*:
Oracle HTTP Server instances are typically configured in a separate Oracle instance directory outside the 11*g* Middleware home.	Oracle HTTP Server instances can be configured as part of an Oracle WebLogic Server domain, using the Oracle Fusion Middleware Configuration Wizard.
Oracle HTTP Server instances are managed using the Oracle Process Manager and the Notification Server (OPMN) management software. Optionally, the Oracle HTTP Server instances can be associated with the WebLogic domain.	When configured as part of an Oracle Application Server Infrastructure domain, Oracle HTTP Server instances can be managed using Oracle Enterprise Manager Fusion Middleware Control and the Oracle WebLogic Scripting Tool (WLST). In Oracle Fusion Middleware 12*c*, the Node Manager agent is responsible for delegating and executing management requests to Oracle HTTP Server instances.
`mod_osso` is supported and included with Oracle HTTP Server 11*g*. If you use `mod_osso` in 11*g*, it will be disabled after you upgrade, as it is not supported in 12*c*.	`mod_osso` is not supported or included with Oracle HTTP Server 12*c*. Oracle WebGate is the recommended replacement. You can install WebGate with Oracle HTTP Server. For more information on configuring WebGate with Oracle HTTP Server, see *Oracle Fusion Middleware Installing and Configuring Oracle HTTP Server*.

For more information about the changes to the way system components, such as Oracle HTTP Server, are configured and managed in Oracle Fusion Middleware 12*c*, as well as other key changes for Oracle Fusion Middleware 12*c*, see the following:

- New and Changed Features for 12*c*

- New and Deprecated Terminology for 12*c*
- What is the WebLogic Management Framework?

About Upgrade Restrictions

If you are using two or more Oracle Fusion Middleware products of the same or different versions in a single, supported, Oracle Fusion Middleware configuration, you must consider the interoperability and compatibility factors before planning the upgrade.

Interoperability

In the context of Oracle Fusion Middleware products, interoperability is defined as the ability of two Oracle Fusion Middleware products or components of the same version (or release) to work together (interoperate) in a supported Oracle Fusion Middleware configuration. Specifically, interoperability applies when the first 4 digits of the release or version number are the same. For example, Oracle Fusion Middleware 12*c* (12.2.1.0) components are generally interoperable with other 12*c* (12.2.1.3.0) components.

Compatibility

In the context of Oracle Fusion Middleware products, compatibility is defined as the ability of two Oracle Fusion Middleware components of different versions (or releases) to interoperate.

For a list of products and features available in Oracle Fusion Middleware Release 12.2.1.3.0, see Products and Features Available in Oracle Fusion Middleware in *Understanding Interoperability and Compatibility*.

When performing the upgrade of your hardware or software, verify that your Oracle Fusion Middleware software is certified to support the new operating system or computer hardware. For more information, refer to the following resources:

- Oracle Fusion Middleware Supported System Configurations
- Oracle® Fusion Middleware System Requirements and Specifications

How to use this Guide

The procedure to upgrade Oracle HTTP Server is determined by whether it's a standalone deployment or a managed deployment.

Depending upon the type of your deployment, navigate to one of the following parts of this guide:

- Upgrading Oracle HTTP Server from 11*g* to 12*c*
  - Upgrading a Standalone Oracle HTTP Server from 11*g* to 12*c*
  - Upgrading a Managed Oracle HTTP Server from 11*g* to 12*c*
- Upgrading Oracle HTTP Server from a Previous 12*c* Release
  - Upgrading a Standalone Oracle HTTP Server from a Previous 12*c* Release
  - Upgrading a Managed Oracle HTTP Server from a Previous 12*c* Release

Note:

Before you start your upgrade, make sure that you review the introductory topics and complete the required pre-upgrade tasks.

Determining whether Oracle HTTP Server is Standalone or Managed (Collocated)

Oracle HTTP Server is the web server component for Oracle Fusion Middleware. It provides a listener for Oracle WebLogic Server and the framework for hosting static pages, dynamic pages, and applications over the Web. If you configure Oracle HTTP Server in a WebLogic Server domain, it is the Managed Oracle HTTP Server because you can manage the Oracle HTTP Server instances like any other elements of the WebLogic Server domain using Enterprise Manager Fusion Middleware Control, or the WLST command-line interface, or the Node Manager. If you install the Oracle HTTP software in a separate Oracle home without installing the Oracle Fusion Middleware Infrastructure, it is the standalone mode.
To determine whether you are upgrading a managed or a standalone Oracle HTTP Server:

If you are an 11*g* user: Check for the `registered` property in the file `*ORACLE_INSTANCE*/config/OPMN/opmn/instance.properties`. If it is set to true, then the instance is registered. A managed Oracle HTTP Server is registered, if it is not registered then it is Standalone Oracle HTTP Server.

If you are a 12*c* user: Check the element `extention-template-ref` and its attribute `name` in the file `*DOMAIN_HOME*/init-info/domain-info.xml`. If you find an element with the name **Oracle HTTP Server (Standalone)**, then it is a standalone Oracle HTTP Server. And if you find an element with name **Oracle HTTP Server (Collocated)**, then it is collocated.

2 Preparing to Upgrade Oracle HTTP Server

Upgrade is performed while the servers are down. The pre-upgrade tasks are often time-consuming. Oracle recommends that you plan and prepare your environment for upgrade by completing these pre-upgrade tasks, so that you have a successful upgrade and a limited downtime.

> **Note:**
>
> If you are installing Oracle HTTP Server on your certified Windows operating system, you should verify that the msvcr90.dll and linkinfo.dll library files exist on your system; these are required by Oracle HTTP Server. See Missing Libraries Might Cause HTTPD to Exit Without Notice in *Release Notes for Oracle HTTP Server Release Notes*. If you are unable to obtain the required libraries on your system, contact Microsoft support for further assistance.

Use the following checklist to make sure you complete the pre-upgrade tasks:

- Pre-Upgrade Checklist
  The Pre-Upgrade Checklist identifies tasks that can be performed before you begin your upgrade to ensure you have a successful upgrade and limited downtime.
- Creating a Complete Backup
  Before you start an upgrade, back up all system-critical files, including the databases that host your Oracle Fusion Middleware schemas.
- Cloning Your Production Environment for Testing
  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
  Review the certification matrix and system requirements documents to verify that your environment meets the necessary requirements for installation.
- Updating Policy Files when Using Enhanced Encryption (AES 256)
  If you plan to use enhanced encryption, such as Advanced Encryption Standard (AES 256), in your upgraded environment, Oracle recommends that you apply the latest required policy files to the JDK before you upgrade.
- Purging Unused Data
  Purging unused data and maintaining a purging methodology before an upgrade can optimize the upgrade process.
- Creating an Edition on the Server for Edition-Based Redefinition
  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 12*c* (12.2.1.3.0).

- Creating a Non-SYSDBA User to Run the Upgrade Assistant
  Oracle recommends that you create a non-SYSDBA user called `FMW` to run the Upgrade Assistant. This user has the privileges required to modify schemas, but does not have full administrator privileges.

Pre-Upgrade Checklist

The Pre-Upgrade Checklist identifies tasks that can be performed before you begin your upgrade to ensure you have a successful upgrade and limited downtime.

Upgrades are performed while the servers are down. This checklist is meant to identify important — and often time-consuming — pre-upgrade tasks that you can perform before the upgrade to limit your downtime. The more preparation you can do before you begin the upgrade process, the less time you will spend offline.

> **Note:**
>
> The pre-upgrade procedures you perform will 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. Complete only those tasks that apply to your configurations or use cases.

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

Task	Description
Required Create a complete backup of your existing environment.	Back up all system-critical files and database(s) that contain any schemas that are to be upgraded. If the upgrade fails, you must restore your pre-upgrade environment and begin the upgrade again. See Creating a Complete Backup. • Make sure that your backup includes the schema version registry table. See Backing Up the Schema Version Registry Table. • If you modified any of the startup scripts in your existing domain, you will need to copy them to temporary directory location (outside of the existing domain) during the upgrade and redeploy them after the upgrade.
Optional Clone your production environment to use as an upgrade testing platform.	In addition to creating a complete backup of your system files, Oracle strongly recommends that you clone your production environment. This environment can be used to test the upgrade. See Cloning Your Production Environment.

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

Task	Description
Required Verify that you are installing and upgrading your product on a supported hardware and software configuration. 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.	Verify that your hardware and software configurations (including operating systems) are supported by the latest certifications and requirements documents. Also make sure to use a supported JDK version before you install the 12*c* product distributions. Oracle recommends that you verify this information right before you start the upgrade as the certification requirements are frequently updated. Make sure that you have applied the latest patches to your components before you upgrade. See Verifying Certification and System Requirements.
Required for 32–bit Operating Systems Only Migrate to a 64-bit operating system before you can upgrade.	This is required only if you are currently running an unsupported 32–bit operating system.
Optional Update security policy files if you are using enhanced encryption (AES 256).	Some of the security algorithms used in Fusion Middleware 12*c* require additional policy files for the JDK. If you plan to use enhanced encryption, such as AES 256, Oracle recommends that you apply the latest required policy files to the JDK before you upgrade. See Updating Policy Files when Using Enhanced Encryption (AES 256).
Optional Purge any outdated or unused data before you upgrade.	To optimize performance, Oracle strongly recommends that you purge data and objects that will not be used in the upgraded environment. See Purging Unused Data.
Required for Oracle Database Users Only 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 12*c* (12.2.1.3.0).	If you are using an Edition-Based Redefinition (EBR) database, you must create the edition before starting the upgrade. See Creating an Edition on the Server for Edition-Based Redefinition.
Optional Create a Non-SYSDBA user to run the Upgrade Assistant.	Oracle recommends that you create the FMW user to run Upgrade Assistant. User FMW can run the Upgrade Assistant without system administration privileges. See Creating a Non-SYSDBA User to Run the Upgrade Assistant
Optional Identify which schemas are currently in your domain before you begin.	It is important that you know which schemas are in your pre-upgrade domain before you start the upgrade. You should know the schema owner names and passwords, as well as the versions of each schema.

Creating a Complete Backup

Before you start an upgrade, back up all system-critical files, including the databases that host your Oracle Fusion Middleware schemas.

The backup must include the `SYSTEM.SCHEMA_VERSION_REGISTRY$` table so that you can restore the contents back to its pre-upgrade state if the upgrade fails.

The Upgrade Assistant Prerequisites screen prompts you to acknowledge that backups have been performed before you proceed with the actual upgrade. However, note that the Upgrade Assistant does not verify that a backup has been created.

See:

- Backing Up Your Environment in *Administering Oracle Fusion Middleware*
- Upgrading and Preparing Your Oracle Databases for 12*c* (12.2.1.3.0) in *Planning an Upgrade of Oracle Fusion Middleware*
- Backing Up the Schema Version Registry Table
  Your system backup must include the `SYSTEM.SCHEMA_VERSION_REGISTRY$` table or the `FMWREGISTRY.SCHEMA_VERSION_REGISTRY$` table.
- Maintaining Customized Domain and Environment Settings
  If you have modified any domain-generated, server startup scripts, or configuration files in your pre-upgrade environment, it is important to note that these changes are overwritten during the installation, domain upgrade, and reconfiguration operations. Save your customized files to a shared library location so that you can continue to use them after the upgrade.

Backing Up the Schema Version Registry Table

Your system backup must include the `SYSTEM.SCHEMA_VERSION_REGISTRY$` table or the `FMWREGISTRY.SCHEMA_VERSION_REGISTRY$` table.

Each Fusion Middleware schema has a row in the `SYSTEM.SCHEMA_VERSION_REGISTRY$` table. If you run the Upgrade Assistant to update an existing schema and it does not succeed, you must restore the original schema before you can try again. Before you run the Upgrade Assistant, make sure you back up your existing database schemas and the schema version registry.

> **Note:**
>
> Before you upgrade a schema using the Upgrade Assistant, you must perform a complete database backup. During the upgrade, you are required to acknowledge that backups have been performed.

Maintaining Customized Domain and Environment Settings

If you have modified any domain-generated, server startup scripts, or configuration files in your pre-upgrade environment, it is important to note that these changes are overwritten during the installation, domain upgrade, and reconfiguration operations. Save your customized files to a shared library location so that you can continue to use them after the upgrade.

Every domain installation includes dynamically-generated domain and server startup scripts, such as `setDomainEnv`. These files are replaced by newer versions during the installation and upgrade process. To maintain your custom domain-level environment settings, Oracle recommends that you create a separate file to store the custom domain information before you upgrade, instead of modifying the scripts directly.

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 command-line options for running the servers, or specify additional environment variables. When using the pack and unpack commands, any custom settings that you add to this file are preserved during the domain upgrade operation and are carried over to the remote servers.

The following example illustrates 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 *EXISTING_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 in *Upgrading Oracle WebLogic Server*.

Cloning Your Production Environment for Testing

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.

Cloning your production environment for testing is recommended, but not required.

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:

It is beyond the scope of this document to describe the cloning procedures for all components and operating systems. Cloning procedures are component and operating system-specific. At a high level, you 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.

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, and so on).

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.

Verifying Certification and System Requirements

Review the certification matrix and system requirements documents 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 Oracle Fusion Middleware 12*c* (12.2.1.3.0).

- Verify That the JDK Is Certified for This Release of Oracle Fusion Middleware
  At the time this document was published, the certified JDK for 12*c* (12.2.1.3.0) was 1.8.0_131.

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 appropriate 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. See the Certification Matrix for 12*c* (12.2.1.3.0).

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.

Use the *Oracle Fusion Middleware System Requirements and Specifications* document to verify that the requirements of the certification are met. For example, if the Certification Matrix for 12*c* (12.2.1.3.0) indicates that your product is certified for installation on 64-Bit Oracle Linux 7, the System Requirements and Specifications document should be used to verify that your Oracle Linux 7 system has met the required minimum specifications such as 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 on the Oracle Technology Network (OTN).

> **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 existing, pre-upgrade Oracle Fusion Middleware software. On UNIX operating systems, this ensures that the proper owner and group is applied to new Oracle Fusion Middleware 12c files and directories.

If you are running a 32–bit environment, you will need to perform an additional set of steps:

- Migrating from a 32-Bit to a 64-Bit Operating System
  If you have a 32–bit operating system, then you must migrate your 32-bit environment to a 64-bit software environment before you upgrade.

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

If you have a 32–bit operating system, then you must migrate your 32-bit environment to a 64-bit software environment before you upgrade.

Make sure to validate the migration to ensure all your Oracle Fusion Middleware 12*c* (12.2.1.2.0) software is working properly on the 64-bit machine, and only then perform the upgrade to Oracle Fusion Middleware 12*c* (12.2.1.3.0).

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 the 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
  Before upgrading, you must stop all processes, including Managed Servers, the Administration Server, 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 12*c* (12.2.1.2.0) 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 12c (12.2.1.2.0) 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 12c (12.2.1.2.0) Backup from 32-bit Host to 64-bit Host
  Restore the files you backed from the 32-bit host using the same directory structure that was used in 12*c* (12.2.1.2.0). The directory structure on the target machine must be identical to the structure of the host machine.
- Install the 12c (12.2.1.3.0) Product Distributions on the Target Machine
  Oracle recommends an Out-of-Place approach for upgrade. Therefore, you must install the 12*c* (12.2.1.3.0) 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 product component individually using an Upgrade Utility specified in the component-specific upgrade guide and complete any post-upgrade tasks.

Procure the Hardware That Supports the 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

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

Stop the Managed Servers

To stop a WebLogic Server Managed Server, use the `stopManagedWebLogic` script:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopManagedWebLogic.sh managed_server_name admin_url`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopManagedWebLogic.cmd managed_server_name admin_url`

When prompted, enter your user name and password.

Stop the Administration Server

When you stop the Administration Server, you also stop the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To stop the Administration Server, use the `stopWebLogic` script:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopWebLogic.sh`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Stop Node Manager

To stop Node Manager, close the command shell in which it is running.

Alternatively, after having set the `nodemanager.properties` attribute `QuitEnabled` to `true` (the default is `false`), you can use WLST to connect to Node Manager and shut it down. See stopNodeManager in *WLST Command Reference for WebLogic Server*.

Back Up All Files from the 32-bit Host Machine

Make sure that you have created a complete backup of your entire 12*c* (12.2.1.2.0) 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.

See Backing Up Your Environment in *Administering Oracle Fusion Middleware*.

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

- *12c_DOMAIN_HOME*
- `12c/nodemanager` directory located in `12c_ORACLE_HOME/wlserver/common/`

Some of the backup and recovery procedures described in Backing Up Your Environment in *Administering Oracle Fusion Middleware* are product-specific. Do not proceed with the upgrade until you have a complete backup.

Set Up the Target 64-bit Machine with the 12*c* (12.2.1.2.0) 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 vary by operating system. Consult your operating system's administration documentation for more information.

Restore the 12*c* (12.2.1.2.0) Backup from 32-bit Host to 64-bit Host

Restore the files you backed from the 32-bit host using the same directory structure that was used in 12*c* (12.2.1.2.0). The directory structure on the target machine must be identical to the structure of the host machine.

See Recovering Your Environment in *Oracle Fusion Middleware Administrator's Guide*.

Install the 12*c* (12.2.1.3.0) Product Distributions on the Target Machine

Oracle recommends an Out-of-Place approach for upgrade. Therefore, you must install the 12*c* (12.2.1.3.0) product distributions in a new Oracle home on the target machine.

Refer to the component-specific installation guides for the component(s) you are installing.

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

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

If you are upgrading additional components, see the component-specific upgrade guide.

> **Note:**
>
> The Node Manager upgrade procedure requires access to the original Node Manager files. Use the 12*c* (12.2.1.2.0) Node Manger files that you backed up from the 32-bit source machine as part of Back Up All Files from the 32-bit Host Machine.

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 Oracle Fusion Middleware 12*c* (12.2.1.3.0).

Review the Fusion Middleware database requirements before starting the upgrade to ensure that the database hosting Oracle Fusion Middleware is supported and has sufficient space to perform an upgrade. See the Certification Matrix for 12*c* (12.2.1.3.0).

> **Note:**
>
> If your database version is no longer supported, you must upgrade to a supported version before starting an upgrade. See Upgrading and Preparing Your Oracle Databases for 12*c* (12.2.1.3.0) in *Planning an Upgrade of Oracle Fusion Middleware*.

Verify That the JDK Is Certified for This Release of Oracle Fusion Middleware

At the time this document was published, the certified JDK for 12*c* (12.2.1.3.0) was 1.8.0_131.

Refer to the Oracle Fusion Middleware Supported System Configurations information on the Oracle Technology Network (OTN) to verify that the JDK you are using is supported.

If your JDK is not supported, or you do not have a JDK installed, you must download the required Java SE JDK, from the following website:

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

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 following directory: `/home/oracle/products/jdk`.

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*.

Updating Policy Files when Using Enhanced Encryption (AES 256)

If you plan to use enhanced encryption, such as Advanced Encryption Standard (AES 256), in your upgraded environment, Oracle recommends that you apply the latest required policy files to the JDK before you upgrade.

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.

Some of the security algorithms used in Fusion Middleware 12*c* (12.2.1.3.0) require additional policy files for the JDK. See Java Cryptography Architecture Oracle Providers Documentation.

> **Note:**
>
> If you attempt to use enhanced encryption without applying these policy files to the JDK before you begin the upgrade, the upgrade can fail and you must restore the entire pre-upgrade environment and start the upgrade from the beginning.

Purging Unused Data

Purging unused data and maintaining a purging methodology before an upgrade can optimize the upgrade process.

Some components have automated purge scripts. 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.

Creating an Edition on the Server for Edition-Based Redefinition

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 12*c* (12.2.1.3.0).

Edition-based redefinition enables you to upgrade an application's database objects while the application is in use, thus minimizing or eliminating downtime. This is accomplished by changing (redefining) database objects in a private environment known as an edition. Only when all the changes have been made and tested, you make the new version of the application available to users.

> **Note:**
>
> This task must be completed by an Oracle Database User with 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 12*c* (12.2.1.3.0). The new edition for 12*c* (12.2.1.2.0) must be a child of your existing 12c or 12*c* (12.2.1.3.0) edition.

To create an edition on the database server, sign 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_4_0 as child of
Oracle_FMW_12_2_1_3_0;
```

where `Oracle_FMW_12_2_1_3_0` is an example of the edition name you specified in RCU 12.2.1.3 when the 12.2.1.3 schemas were created. Be sure to provide the actual name used when creating the edition.

The following message notifies you that the edition is created successfully:

```
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 command to manually set up the default edition name for the database, for example:

```
ALTER DATABASE DEFAULT EDITION = Oracle_FMW_12_2_1_4_0;
```

Creating a Non-SYSDBA User to Run the Upgrade Assistant

Oracle recommends that you create a non-SYSDBA user called FMW to run the Upgrade Assistant. This user has the privileges required to modify schemas, but does not have full administrator privileges.

SYSDBA is an administrative privilege that is 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 below must be granted to user FMW before starting the Upgrade Assistant.

Notes:

The non-SYSDBA user FMW is created solely for the purpose of running the Upgrade Assistant. After this step is complete, drop the FMW user. Note that privileges required for running the Upgrade Assistant may change from release to release.
By default, the v$xatrans$ table does not exist. You must run the XAVIEW.SQL script to create this table before creating the user. Moreover, the grant select privilege on thev$xatrans$ table is required only by Oracle Identity Governance. If you do not require Oracle Identity Governance for configuration, or if you do not have the v$xatrans$ table, then remove the following line from the script:

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

In the example below, password is the password that you set for the FMW user. When granting privileges, make sure that you specify your actual password.

```
create user FMW identified by password;
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_TABLESPACE_USAGE_METRICS to FMW with grant
option;
grant select on SYS.DBA_DATA_FILES to FMW with grant option;
grant select on SYS.V_$ASM_DISKGROUP to FMW with grant option;
grant select on v$xatrans$ 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;
grant select on dba_subscr_registrations to FMW with grant option;
grant manage scheduler to FMW;
```

If you are upgrading Oracle Identity Manager (OIM) schema, ensure that the FMW user has the following additional privileges:

```
grant execute on SYS.DBMS_FLASHBACK to fmw with grant option;
grant execute on sys.DBMS_SHARED_POOL to fmw with grant option;
grant execute on SYS.DBMS_XMLGEN to FMW with grant option;
grant execute on SYS.DBMS_DB_VERSION to FMW with grant option;
grant execute on SYS.DBMS_SCHEDULER to FMW with grant option;
grant execute on SYS.DBMS_SQL to FMW with grant option;
grant execute on SYS.DBMS_UTILITY to FMW with grant option;
grant ctxapp to FMW with admin option;
grant execute on SYS.DBMS_FLASHBACK TO FMW with grant option;
grant create MATERIALIZED VIEW to FMW with admin option;
grant all on SCHEMA_VERSION_REGISTRY TO FMW with grant option;
grant create SYNONYM to FMW with admin option;
grant execute on CTXSYS.CTX_ADM to FMW with grant option;
grant execute on CTXSYS.CTX_CLS TO FMW with grant option;
grant execute on CTXSYS.CTX_DDL TO FMW with grant option;
grant execute on CTXSYS.CTX_DOC TO FMW with grant option;
grant execute on CTXSYS.CTX_OUTPUT TO FMW with grant option;
grant execute on CTXSYS.CTX_QUERY TO FMW with grant option;
grant execute on CTXSYS.CTX_REPORT TO FMW with grant option;
grant execute on CTXSYS.CTX_THES TO FMW with grant option;
grant execute on CTXSYS.CTX_ULEXER TO FMW with grant option;
grant create JOB to FMW with admin option;
```

Part I

Upgrading Oracle HTTP Server from 11*g* to 12*c*

Part I contains the following chapters:

3 Upgrading a Standalone Oracle HTTP Server from 11*g* to 12*c*

This chapter describes the procedures to upgrade the 11*g* standalone Oracle HTTP Server to 12*c*; one that is not managed by or associated with an existing Oracle WebLogic Server (WLS) domain.
This chapter contains the following sections:

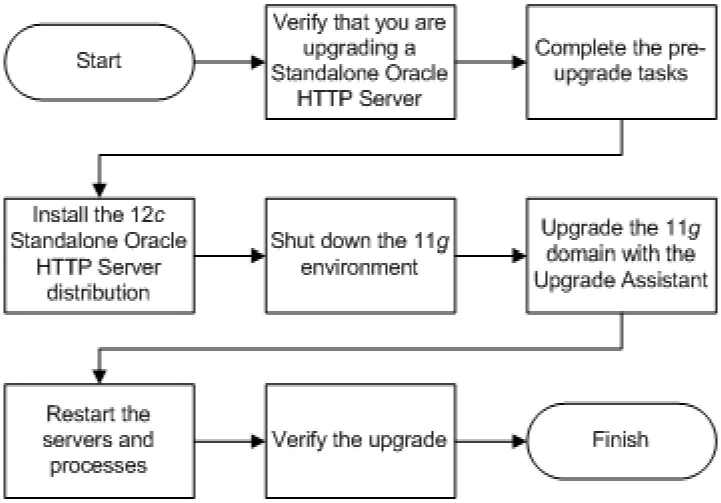
- About the Standalone Oracle HTTP Server Upgrade Process from 11g to 12c
  Review the flowchart and roadmap for an overview of the upgrade process for Oracle HTTP Server.
- Important Pre-Upgrade Considerations
  Before you begin the upgrade, it is important to make sure that your existing setup is not impacted during or after the upgrade. If you are using Oracle Web Cache or WebGate, or if you have Application-specific artifacts in your 11*g* domain, review the topics under this section carefully to prevent impact to your existing setup.
- Installing the Standalone Oracle HTTP Server
  Before you begin your upgrade, download the Oracle HTTP Server 12*c* (12.2.1.3.0) distribution on the target system and install it by using the Oracle Universal Installer.
- Stopping Servers and Processes
  A standalone Web Tier consists of Webcache and OHS as server components, which can be managed by the Oracle Process Manager and Notification (OPMN) server. Before you run the Upgrade Assistant to upgrade domain configurations, you must shut down the OPMN server.
- Upgrading Domain Component Configurations
  After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.
- Starting Servers and Processes
  After a successful upgrade, start the Oracle Process Manager and Notification (OPMN) server and the Web Tier OHS server components.
- Verifying the Upgrade
  You can verify that the upgrade is successful if you are able to start the Node Manager and the Standalone Oracle HTTP Server properly.

About the Standalone Oracle HTTP Server Upgrade Process from 11*g* to 12*c*

Review the flowchart and roadmap for an overview of the upgrade process for Oracle HTTP Server.

Figure 3-1 shows the high-level procedures associated with a standalone Oracle HTTP Server upgrade when the starting point is 11*g*. The tools used for each step are also listed.

Figure 3-1 Upgrade Process Flowchart for Standalone Oracle HTTP Server from 11*g* to 12*c*


Start
Verify that you are upgrading a Standalone Oracle HTTP Server
Complete the pre-upgrade tasks
Install the 12c Standalone Oracle HTTP Server distribution
Shut down the 11g environment
Upgrade the 11g domain with the Upgrade Assistant
Restart the servers and processes
Verify the upgrade
Finish

The following table describes the tasks that must be completed to upgrade a standalone Oracle HTTP Server from 11*g* to 12*c*.

Table 3-1 Tasks for Upgrading Standalone Oracle HTTP Server from 11*g* to 12*c*

Task	Description
Required Verify that you are upgrading a standalone Oracle HTTP Server.	To determine which Oracle HTTP Server you have in your existing environment, see Determining whether Oracle HTTP Server is Standalone or Managed (Collocated).
Required Complete the pre-upgrade tasks.	The pre-upgrade tasks include cloning your production environment, verifying system requirements and certifications, purging unused data, and creating a non-SYSDBA user. For a complete list of pre-upgrade tasks, see Preparing to Upgrade Oracle HTTP Server. Additionally, also complete the tasks listed in: Important Pre-Upgrade Considerations.
Required Install the Standalone Oracle HTTP Server.	Run the installation program to install the software. Select the installation type **Standalone Oracle HTTP Server (managed independently of WebLogic server)**. This transfers the software to your system and creates a new Oracle home directory. See Installing the Standalone Oracle HTTP Server.
Required Shut down the 11*g* environment.	See Stopping Servers and Processes .
Required Upgrade the 11*g* standalone system component configurations.	See Upgrading Domain Component Configurations.
Required Restart the servers and processes.	See Starting Servers and Processes.

Table 3-1 (Cont.) Tasks for Upgrading Standalone Oracle HTTP Server from 11*g* to 12*c*

Task	Description
Required Verify the upgrade.	Your Oracle HTTP Server should continue to function as expected. If you have post-upgrade issues, you must troubleshoot the installation and retry the upgrade. See Troubleshooting Oracle HTTP Server in *Administering Oracle HTTP Server*.

Important Pre-Upgrade Considerations

Before you begin the upgrade, it is important to make sure that your existing setup is not impacted during or after the upgrade. If you are using Oracle Web Cache or WebGate, or if you have Application-specific artifacts in your 11*g* domain, review the topics under this section carefully to prevent impact to your existing setup.

- Oracle Web Cache 11g Users
  Oracle Web Cache is a secure reverse proxy cache and a compression engine deployed between a browser and the HTTP server or a browser and the Content Management server to improve the performance of the websites by caching frequently accessed content. Oracle has released the last version of Web Cache in 11*g*. Web Cache is not available in 12*c*.
- WebGate 11g Users
  A WebGate is a web-server plug-in for Oracle Access Manager (OAM) that intercepts HTTP requests and forwards them to the Access Server for authentication and authorization. WebGate is included as part of the Oracle HTTP Server 12*c* installation and is upgraded as part of the Oracle HTTP Server upgrade process through Upgrade Assistant.
- Updating the WebGate Log file-name
  In Oracle Fusion Middleware 12*c*, the WebGate log file is renamed from `oblog.log` to `webgate.log`. After you upgrade to the latest release of Oracle HTTP Server, you must manually update the `oblog_config_wg.xml` file and replace every occurrence of *`oblog.log`* with *`webgate.log`*.
- Application Artifacts from 11g
  Application artifacts include all your web resources: JSP files, images, stylesheets, Javascript, static HTML pages in addition to your Java classes and source files and web application configuration files. The integrated development environment (IDE) uses all these resources, and refers to them as web application artifacts.
- Migrating 11g Application Artifacts
  You need to manually migrate any 11*g* application artifacts that reside within the Oracle instance, including any combination of static files such as HTML or images, CGI or FastCGI scripts or applications, or third-party modules. Application artifacts that were referred to by the 11*g* configuration, but were stored in directories outside of the Oracle instance, will continue to be referenced by the migrated configuration used by Oracle HTTP Server 12*c*.

Oracle Web Cache 11*g* Users

Oracle Web Cache is a secure reverse proxy cache and a compression engine deployed between a browser and the HTTP server or a browser and the Content Management server to improve the performance of the websites by caching frequently accessed content. Oracle has released the last version of Web Cache in 11*g*. Web Cache is not available in 12*c*.

Consider the following limitations if you are using Web Cache in your 11*g* environment:

- Web Cache is not available in Fusion Middleware 12*c*. Correspondingly, there is no upgrade for Web Cache.
- Web Cache 11*g* front-ending a 12*c* Oracle HTTP Server is not a certified combination.
- If you are using both Web Cache and Oracle HTTP Server in your 11*g* setup, you can only upgrade the Oracle HTTP Server to 12*c*. In that case, you need to disable the 11*g* Web Cache and change the configuration settings to divert the traffic to Oracle HTTP Server directly.
- If you are using both Web Cache and Oracle HTTP Server in your 11*g* setup, and you have associated them with a WebLogic Server (WLS) domain for administering them through the Enterprise Manager Fusion Middleware Control, then you must also upgrade the WLS domain to 12*c*. In that case, the associated Oracle HTTP Server is also upgraded to 12*c*. However, the Web Cache is removed from the 12*c* Fusion Middleware Control.

WebGate 11*g* Users

A WebGate is a web-server plug-in for Oracle Access Manager (OAM) that intercepts HTTP requests and forwards them to the Access Server for authentication and authorization. WebGate is included as part of the Oracle HTTP Server 12*c* installation and is upgraded as part of the Oracle HTTP Server upgrade process through Upgrade Assistant.

> **Note:**
>
> In Oracle Fusion Middleware 12*c* (12.2.1.3.0), WebGate log file is renamed from `oblog.log` to `webgate.log`. After you upgrade to the latest release of Oracle HTTP Server, you must manually update the `oblog_config_wg.xml` file and replace every *`oblog.log`* occurrence with *`webgate.log`*. To complete this task, see Updating the WebGate Log file-name.

Updating the WebGate Log file-name

In Oracle Fusion Middleware 12*c*, the WebGate log file is renamed from `oblog.log` to `webgate.log`. After you upgrade to the latest release of Oracle HTTP Server, you must manually update the `oblog_config_wg.xml` file and replace every occurrence of *`oblog.log`* with *`webgate.log`*.

To update the WebGate log file-name:

1. Change directory to the following path:

   ```
   DOMAIN_HOME/config/fmwconfig/components/OHS/ohs_instance/
   webgate/config
   ```

2. Open the `oblog_config_wg.xml` file in edit mode.

3. Replace every occurrence of *`oblog.log`* with *`webgate.log`*.

Application Artifacts from 11*g*

Application artifacts include all your web resources: JSP files, images, stylesheets, Javascript, static HTML pages in addition to your Java classes and source files and web application configuration files. The integrated development environment (IDE) uses all these resources, and refers to them as web application artifacts.

If you have 11*g* application artifacts that you want to continue using in 12*c*, carefully review the following:

- As part of upgrading Oracle HTTP Server from an 11*g* Oracle instance to a 12*c* domain, the Oracle HTTP Server configuration directory layout is being migrated from an Oracle instance to a standalone domain.
- Oracle HTTP Server 11*g* configuration files that reside in the component configuration directory of the Oracle instance are migrated automatically.
- Application artifacts that reside within the Oracle instance, including any combination of static files (such as HTML or images, CGI or FastCGI scripts or applications, or third-party modules), must be migrated manually after the upgrade to 12*c*.

  See Migrating 11*g* Application Artifacts.

Migrating 11*g* Application Artifacts

You need to manually migrate any 11*g* application artifacts that reside within the Oracle instance, including any combination of static files such as HTML or images, CGI or FastCGI scripts or applications, or third-party modules. Application artifacts that were referred to by the 11*g* configuration, but were stored in directories outside of the Oracle instance, will continue to be referenced by the migrated configuration used by Oracle HTTP Server 12*c*.

For example, if a third-party plug-in module was installed into the Oracle home with Oracle HTTP Server 11*g*, and the configuration referenced it by the Oracle home location using the configuration in the example below, the plug-in module must be installed manually into the Oracle home with 12*c* Oracle HTTP Server or the upgraded configuration must be modified to reference it elsewhere.

```
LoadModule example_module "ORACLE_HOME/ohs/modules/mod_example.so"
```

Similarly, if static files were copied into the `/htdocs` directory within the 11*g* component configuration directory, then they too must be manually copied into the 12*c* instance configuration directory or the upgraded configuration must be modified to reference it elsewhere. Other types of application artifacts must be manually migrated in a similar manner.

Installing the Standalone Oracle HTTP Server

Before you begin your upgrade, download the Oracle HTTP Server 12*c* (12.2.1.3.0) distribution on the target system and install it by using the Oracle Universal Installer.

To install the standalone Oracle HTTP Server:

1. Sign in to the target system.
2. Download the following from Oracle Technology Network or Oracle Software Delivery Cloud to your target system:

Oracle HTTP Server (UNIX: `fmw_12.2.1.2.0_ohs_linux64.bin`), (Windows: `setup_fmw_12.2.1.2.0_ohs_win64.exe`

3. Change to the directory where you downloaded the 12*c* (12.2.1.3.0) product distribution.
4. Check that your machine meet the following requirements:
   - Ensure that the system, patch, kernel, and other requirements are met as specified in theRoadmap for Verifying Your System Environment.
   - Because Oracle HTTP Server is installed by default on port 7777, you must ensure that port 7777 is not used by any service on the nodes. To check if this port is in use, run the following command before you install Oracle HTTP Server. You must free the port if it is in use.

     ```
     netstat -an | grep 7777
     ```
5. Enter the following command to start the installation program:

   (UNIX) `./fmw_12.2.1.2.0_ohs_linux64.bin`

   (Windows) `setup_fmw_12.2.1.2.0_ohs_win64.exe`
6. On UNIX operating systems, the Installation Inventory Setup screen appears if this is the first time you are installing an Oracle product on this host.

   Specify the location where you want to create your central inventory. Make sure that the operating system group name selected on this screen has write permissions to the central inventory location, and click **Next**.

   > **Note:**
   >
   > The Installation Inventory Setup screen does not appear on Windows operating systems.
7. On the Welcome screen, review the information to make sure that you have met all the prerequisites. Click **Next**.
8. On the Auto Updates screen, select an option:
   - **Skip Auto Updates**: If you do not want your system to check for software updates at this time.
   - **Select patches from directory**: To navigate to a local directory if you downloaded patch files.
   - **Search My Oracle Support for Updates**: To automatically download software updates if you have a My Oracle Support account. You must enter Oracle Support credentials then click **Search**. To configure a proxy server for the installer to access My Oracle Support, click **Proxy Settings**. Click **Test Connection** to test the connection.

   Click **Next**.
9. On the Installation Location screen, specify the location for the Oracle home directory and click **Next**.

   As you are installing the standard installation topology for Oracle HTTP Server in a standalone domain, you can specify an Oracle home directory of your choice. However, ensure that you install the software in a new Oracle home.

See Selecting Directories for Installation and Configurationin *Planning an Installation of Oracle Fusion Middleware*.

10. On the Installation Type screen, select **Standalone HTTP Server (Managed independently of WebLogic server)** and click **Next**.
11. The Prerequisite Checks screen analyzes the host computer to ensure that the specific operating system prerequisites have been met.

    To view the list of tasks that are verified, select **View Successful Tasks**. To view log details, select **View Log**. If any prerequisite check fails, then an error message appears at the bottom of the screen. Fix the error and click **Rerun** to try again. To ignore the error or the warning message and continue with the installation, click **Skip** (not recommended).
12. On the Security Updates screen, indicate how you would like to receive security updates if you already have an Oracle Support account.

    If you do not have an Oracle Support account and you are sure that you want to skip this step, clear the check box and verify your selection in the follow-up dialog box.
13. On the Installation Summary screen, verify the installation options that you selected.

    If you want to save these options to a response file, click **Save Response File** and enter the response file location and name. The response file collects and stores all the information that you have entered, and enables you to perform a silent installation (from the command line) at a later time.
    Click **Install** to begin the installation.
14. On the Installation Progress screen, when the progress bar displays 100%, click **Finish** to dismiss the installer, or click **Next** to see a summary.
15. The Installation Complete screen displays the Installation Location and the Feature Sets that are installed. Review this information and click **Finish** to close the installer.

You have installed the Oracle HTTP Server in a standalone mode.

Stopping Servers and Processes

A standalone Web Tier consists of Webcache and OHS as server components, which can be managed by the Oracle Process Manager and Notification (OPMN) server. Before you run the Upgrade Assistant to upgrade domain configurations, you must shut down the OPMN server.

Stop all the OPMN components in the Oracle Instance that you are upgrading, using the `opmnctl` command.

For example:

```
$ORACLE_INSTANCE/bin/opmnctl stopall
```

Upgrading Domain Component Configurations

After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.

- Starting the Upgrade Assistant
  Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

- Upgrading the 11g Domain Components Using the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.
- Verifying the Domain-Specific-Component Configurations Upgrade
  To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

Starting the Upgrade Assistant

Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

To start the Upgrade Assistant:

> **Note:**
>
> Before you start the Upgrade Assistant, make sure that the JVM character encoding is set to UTF-8 for the platform on which the Upgrade Assistant is running. If the character encoding is not set to UTF-8, then you will not be able to download files containing Unicode characters in their names. This can cause the upgrade to fail.

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant:
   - (UNIX) `./ua`
   - (Windows) `ua.bat`

For information about other parameters that you can specify on the command line, such as logging parameters, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 3-2 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `-logLevel TRACE` is used.

Table 3-2 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Upgrading the 11*g* Domain Components Using the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.

To upgrade the 11*g* domain using Upgrade Assistant:

1. On the Welcome screen, review an introduction to the Upgrade Assistant and information about important pre-upgrade tasks. Click **Next**.

   > **Note:**
   >
   > For more information about any Upgrade Assistant screen, click **Help** on the screen.

2. On the Domain Directory screen, select **Create a New Domain (choose when upgrading from 11g)**.
3. On the Standalone Components screen, select **Standalone System Component Configurations**.

   Select **Create a New Domain** and click **Next**.

> **Note:**
>
> - **Create a New Domain** option should only be used if you are upgrading from version 11*g*.
> - If you have already created a new 12*c* standalone domain for your upgraded 11*g* system components, you can extend the standalone domain with the standalone Oracle HTTP Server using **Update an Existing Domain** option.
> - **Update an Existing Domain** option should only be used if you are upgrading from a previous 12*c* release (12.1.2.0.0, 12.1.3.0.0, 12.2.1.0.0, 12.2.1.1.0, and 12.2.1.2.0) to the latest 12*c* release (12.2.1.3.0).

4. On the Component List screen, verify that the list includes all the components for which you want to upgrade configurations and click **Next**.

   If you do not see the components you want to upgrade, click **Back** to go to the previous screen and specify a different domain.

5. On the Prerequisites screen, acknowledge that the prerequisites have been met by selecting all the check boxes. Click **Next**.

> **Note:**
>
> The Upgrade Assistant does not verify whether the prerequisites have been met.

6. On the Instance Directories screen, select **11*g* Source** and provide the directory location of the 11g instance that you want to upgrade.

   This instance is used as a basis for configuring the 12*c* Oracle HTTP Server instance. The 11*g* Oracle HTTP Server installation is not altered.

   Click **+** to add additional 11*g* instance directories, if necessary. Click **Next**.

> **Note:**
>
> You cannot use the Upgrade Assistant to upgrade Oracle 10*g* instances to Oracle 12*c*. You must first upgrade Oracle 10*g* instances to 11*g*. For more information on migrating 10*g* to 11*g*, see the 11*g* upgrade documentation for your components.

7. On the Node Manager screen, specify the following to create a new Node Manager to administer your standalone domain.

Table 3-3 Field Descriptions for the Node Manager Screen

Option	Description
User Name	To specify the user name used to access Node Manager.

Table 3-3 (Cont.) Field Descriptions for the Node Manager Screen

Option	Description
Password	To specify the password used to access Node Manager. Re-enter the password for confirmation.
Listen Address	To enter the DNS name or IP address upon which Node Manager listens.
Listen Port	To enter the listening port number of Node Manager.

> **Note:**
>
> The user name and password are only used to authenticate connections between Node Manager and clients. They are independent of the server Administrator credentials.

8. On the Examine screen, review the status of the Upgrade Assistant as it examines each standalone component, verifying that the standalone component configuration is ready for upgrade. If the status is **Examine finished**, click **Next**.

   If the examine phase fails, Oracle recommends that you cancel the upgrade by clicking **No** in the Examination Failure dialog. Click **View Log** to see what caused the error and refer to Troubleshooting Your Upgrade in *Upgrading with the Upgrade Assistant*for information on resolving common upgrade errors.

   > **Note:**
   >
   > - If you resolve any issues detected during the examine phase without proceeding with the upgrade, you can start the Upgrade Assistant again without restoring from backup. However, if you proceed by clicking **Yes** in the Examination Failure dialog box, you need to restore your pre-upgrade environment from backup before starting the Upgrade Assistant again.
   > - Canceling the examination process has no effect on the configuration data; the only consequence is that the information the Upgrade Assistant has collected must be collected again in a future upgrade session.

9. On the Upgrade Summary screen, review the summary of the options you have selected for component configuration upgrade.

   The response file collects and stores all the information that you have entered, and enables you to perform a silent upgrade at a later time. The silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again. If you want to save these options to a response file, click **Save Response File** and provide the location and name of the response file.
   Click **Upgrade** to start the upgrade process.

10. On the Upgrade Progress screen, monitor the status of the upgrade.

> **Caution:**
>
> Allow the Upgrade Assistant enough time to perform the upgrade. Do not cancel the upgrade operation unless absolutely necessary. Doing so may result in an unstable environment.

If any components are not upgraded successfully, refer to the Upgrade Assistant log files for more information.

> **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.

Click **Next**.

11. If the upgrade is successful: On the Upgrade Success screen, click **Close** to complete the upgrade and close the wizard. The Post-Upgrade Actions window describes the manual tasks you must perform to make components functional in the new installation. This window appears only if a component has post-upgrade steps.

    If the upgrade fails: On the Upgrade Failure screen, click **View Log** to view and troubleshoot the errors. The logs are available at `ORACLE_HOME/oracle_common/upgrade/logs`. Note If the upgrade fails you must restore your pre-upgrade environment from backup, fix the issues, then restart the Upgrade Assistant.

Verifying the Domain-Specific-Component Configurations Upgrade

To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

To sign in to the Administration Console, go to: `http://administration_server_host:administration_server_port/console`

To sign in to Oracle Enterprise Manager Fusion Middleware Control Console, go to: `http://administration_server_host:administration_server_port/em`

> **Note:**
>
> After upgrade, make sure you run the administration tools from the new 12*c* (12.2.1.3.0) Oracle home directory and not from the previous Oracle home directory.
>
> During the upgrade process, some OWSM documents, including policy sets and predefined documents such as policies and assertion templates, may need to be upgraded. If a policy set or a predefined document is upgraded, its version number is incremented by 1.
>
> If you created the FMW user to run the Upgrade Assistant, ensure that you delete the account after verifying your upgrade was successful.

Starting Servers and Processes

After a successful upgrade, start the Oracle Process Manager and Notification (OPMN) server and the Web Tier OHS server components.

> **Note:**
>
> WebCache is not upgraded/supported in 12c.

You can use the `opmnctl` command to start the OPMN server and the Web Tier components after the upgrade.

For example:

```
$ORACLE_INSTANCE/bin/opmnctl startall
```

> **Note:**
>
> If you changed to internal authentication before upgrading product schemas, change back to external authentication after starting the servers and processes.

- Starting the Standalone Oracle HTTP Server
  After the upgrade, start the standalone Oracle HTTP Server.

Starting the Standalone Oracle HTTP Server

After the upgrade, start the standalone Oracle HTTP Server.

To start the standalone Oracle HTTP Server:

1. Go to the DOMAIN_HOME/bin directory:

   (UNIX) ORACLE_HOME/user_projects/domains/<*domain name*>/bin

(WINDOWS) ORACLE_HOME\user_projects\domains\<*domain name*>\bin

2. Enter the command to start the standalone server.

   On UNIX operating systems:

   ```
   ./startComponent.sh ohs_name
   ```

   On Windows operating systems:

   ```
   startComponent.cmd ohs_name
   ```

   See Starting and Stopping System Components in *Administering Oracle Fusion Middleware*.

Verifying the Upgrade

You can verify that the upgrade is successful if you are able to start the Node Manager and the Standalone Oracle HTTP Server properly.

If you experience post-upgrade issues, you need to troubleshoot the installation and retry the upgrade. See Troubleshooting Oracle HTTP Server in *Administrator's Guide for Oracle HTTP Server*.

If you are not able to start the newly upgraded environment, a possible cause could be the use of MD5 certificates in your Oracle wallet. To check whether you are using MD5 signatures and how to replace them with SHA-2 certificates, see Replacing Certificate Signed Using MD5 Algorithm with Certificate Signed Using SHA-2 Algorithm .

4 Upgrading a Managed Oracle HTTP Server from 11*g* to 12*c*

This chapter describes the procedure to upgrade a managed Oracle HTTP Server from 11*g* to 12*c*. The valid starting points for this upgrade are 11*g* releases 11.1.1.7 and above.

Complete the steps in the following topics to perform the upgrade:

- About the Managed Oracle HTTP Server Upgrade Process from 11g to 12c
  Review the flowchart and roadmap for an overview of the upgrade process for Managed Oracle HTTP Server.
- Installing the Product Distributions
  Before you begin your upgrade, download Oracle Fusion Middleware Infrastructure and Oracle HTTP Server 12*c* (12.2.1.3.0) distributions on the target system and install them using Oracle Universal Installer.
- Running a Pre-Upgrade Readiness Check
  To identify potential issues with the upgrade, Oracle recommends that you run a readiness check before you start the upgrade process. Be aware that the readiness check may not be able to discover all potential issues with your upgrade. An upgrade may still fail, even if the readiness check reports success.
- Stopping Servers and Processes
  Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.
- Creating the Required 12c Schemas with the RCU
  When upgrading, you must create the required schemas. You can use the Repository Creation Utility (RCU) to create customized schemas or, optionally, you can use the Upgrade Assistant to create schemas using the default schema settings. This procedure describes how to create schemas using the RCU. Information about using the Upgrade Assistant to create schemas is covered in the upgrade procedures.
- About Reconfiguring the Domain
  Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).
- Upgrading Domain Component Configurations
  After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.
- Starting Servers and Processes
  After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.
- Verifying the Upgrade
  If you can log in to the Administration Console, the Enterprise Manager Fusion Middleware Control, and the OHS Home Page, then your upgrade is successful.
- Importing Wallets to the KSS Database after an Upgrade Using WLST
  When you use Upgrade Assistant to upgrade from a previous version of Oracle HTTP Server to 12*c* (12.2.1.3.0), you must perform an additional wallet management task.

About the Managed Oracle HTTP Server Upgrade Process from 11*g* to 12*c*

Review the flowchart and roadmap for an overview of the upgrade process for Managed Oracle HTTP Server.

Figure 4-1 shows the process flow to upgrade a Managed Oracle HTTP Server to the latest 12*c* release. The tools used for each step are also listed.

Figure 4-1 Upgrade Process Flowchart for Managed Oracle HTTP Server from 11*g* to 12*c*

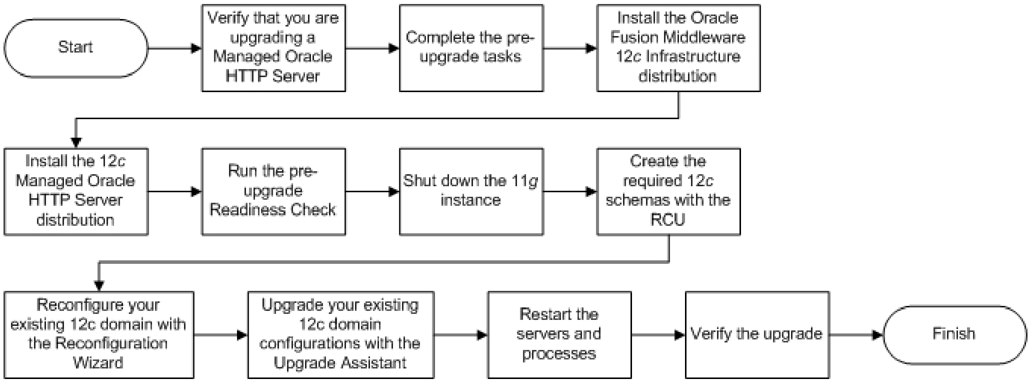

Start
Verify that you are upgrading a Managed Oracle HTTP Server
Complete the pre-upgrade tasks
Install the Oracle Fusion Middleware 12c Infrastructure distribution
Install the 12c Managed Oracle HTTP Server distribution
Run the pre-upgrade Readiness Check
Shut down the 11g instance
Create the required 12c schemas with the RCU
Reconfigure your existing 12c domain with the Reconfiguration Wizard
Upgrade your existing 12c domain configurations with the Upgrade Assistant
Restart the servers and processes
Verify the upgrade
Finish

Table 6-1 describes the tasks that must be completed to upgrade a Managed Oracle HTTP Server from a 11*g* release to 12*c* (12.2.1.3.0).

Table 4-1 Tasks for Upgrading Managed Oracle HTTP Server from 11*g* to 12*c*

Task	Description
Required Verify that you are upgrading a Managed Oracle HTTP Server.	To determine which Oracle HTTP Server you have in your existing environment, see Determining whether Oracle HTTP Server is Standalone or Managed (Collocated).
Required If you have not done so already, review the introductory topics in this guide and complete the required pre-upgrade tasks.	The pre-upgrade tasks include cloning your production environment, verifying system requirements and certifications, purging unused data, and creating a non-SYSDBA user. For a complete list of pre-upgrade tasks, see Preparing to Upgrade Oracle HTTP Server.

Table 4-1 (Cont.) Tasks for Upgrading Managed Oracle HTTP Server from 11*g* to 12*c*

Task	Description
Required Download and install the 12.2.1.3.0 Fusion Middleware Infrastructure and Oracle HTTP Server distributions.	The Infrastructure distribution packs the WebLogic Server and the Java Required Files (JRF) that are required to set up the foundation to install other Fusion Middleware products. As per the upgrade topology defined in this guide, you must install the Infrastructure in a new Oracle home directory. You must install Oracle HTTP Server in the Oracle home directory that is created when you installed the 12.2.1.3.0 Infrastructure. See Installing the Product Distributions.
Optional Run the Readiness Check.	See Running a Pre-Upgrade Readiness Check.
Required Shut down the 11*g* instance.	Before you start the upgrade process, shut down the Administration Server, the Managed Servers, and your 11*g* instance. See Stopping Servers and Processes .
Required Create the required 12*c* schemas.	See Creating the Required 12*c* Schemas with the RCU.
Required Reconfigure your existing 12*c* domain with the Reconfiguration Wizard.	Run the Reconfiguration Wizard from the 12*c* Oracle HTTP Server installation to reconfigure the existing domain. See About Reconfiguring the Domain.
Required Upgrade your existing 12*c* domain configurations with the Upgrade Assistant.	After the installation, you need to use the Upgrade Assistant to upgrade the Oracle HTTP Server and system component infrastructure. See Upgrading Domain Component Configurations.
Required Restart the servers and processes.	The upgrade process is complete. You can now restart the Administration Server, the Managed Servers, and your 12.2.1.3.0 instance. See Starting Servers and Processes.
Required Verify the upgrade.	For verifying the upgrade, see Verifying the Upgrade. Complete the following post-upgrade task: Importing Wallets to the KSS Database after an Upgrade Using WLST.

Installing the Product Distributions

Before you begin your upgrade, download Oracle Fusion Middleware Infrastructure and Oracle HTTP Server 12*c* (12.2.1.3.0) distributions on the target system and install them using Oracle Universal Installer.

> **Note:**
>
> When Infrastructure is required for the upgrade, you must install the Oracle Fusion Middleware distribution first before you install other Fusion Middleware products.

To install the 12*c* (12.2.1.3.0) distributions:

1. Sign in to the target system.
2. Download the following from Oracle Technology Network or Oracle Software Delivery Cloud to your target system:
   - Oracle Fusion Middleware Infrastructure (`fmw_12.2.1.3.0_infrastructure_generic.jar`)
   - Oracle HTTP Server (UNIX: `fmw_12.2.1.2.0_ohs_linux64.bin`), (Windows: `setup_fmw_12.2.1.2.0_ohs_win64.exe`)
3. Check that your machines meet the following requirements:
   - Ensure that the system, patch, kernel, and other requirements are met as specified in *Installing and Configuring Oracle HTTP Server*.
   - Because Oracle HTTP Server is installed by default on port 7777, you must ensure that port 7777 is not used by any service on the nodes. To check if this port is in use, run the following command before you install Oracle HTTP Server. You must free the port if it is in use.

     ```
     netstat -an | grep 7777
     ```
4. On UNIX platforms, if the `/etc/oraInst.loc` file exists, check that its contents are correct. Specifically, check that the inventory directory is correct and that you have write permissions for that directory.

   If the `/etc/oraInst.loc` file does not exist, you can skip this step.
5. Change to the directory where you downloaded the 12*c* (12.2.1.3.0) product distribution.
6. Start the installation program for Oracle Fusion Middleware Infrastructure:
   - (UNIX) `JDK_HOME/bin/java -jar fmw_12.2.1.3.0_infrastructure_generic.jar`
   - (Windows) `JDK_HOME\bin\java -jar fmw_12.2.1.3.0_infrastructure_generic.jar`
7. On UNIX operating systems, the Installation Inventory Setup screen appears if this is the first time you are installing an Oracle product on this host.

Specify the location where you want to create your central inventory. Make sure that the operating system group name selected on this screen has write permissions to the central inventory location, and click **Next**.

> **Note:**
>
> The Installation Inventory Setup screen does not appear on Windows operating systems.

8. On the Welcome screen, review the information to make sure that you have met all the prerequisites. Click **Next**.
9. On the Auto Updates screen, select an option:
   - **Skip Auto Updates**: If you do not want your system to check for software updates at this time.
   - **Select patches from directory**: To navigate to a local directory if you downloaded patch files.
   - **Search My Oracle Support for Updates**: To automatically download software updates if you have a My Oracle Support account. You must enter Oracle Support credentials then click **Search**. To configure a proxy server for the installer to access My Oracle Support, click **Proxy Settings**. Click **Test Connection** to test the connection.

   Click **Next**.
10. On the Installation Location screen, specify the location for the Oracle home directory and click **Next**.

    Since you are installing the standard installation topology for a collocated Oracle HTTP Server in a WebLogic Server domain, enter the path to an existing Oracle Fusion Middleware Infrastructure Oracle home.

    See Selecting Directories for Installation and Configuration in *Planning an Installation of Oracle Fusion Middleware*.
11. On the Installation Type screen, select the following:
    - For Infrastructure, select **Fusion Middleware Infrastructure**
    - For Oracle HTTP Server, select **Collocated HTTP Server (Managed through WebLogic Server)**

    Click **Next**.
12. The Prerequisite Checks screen analyzes the host computer to ensure that the specific operating system prerequisites have been met.

    To view the list of tasks that are verified, select **View Successful Tasks**. To view log details, select **View Log**. If any prerequisite check fails, then an error message appears at the bottom of the screen. Fix the error and click **Rerun** to try again. To ignore the error or the warning message and continue with the installation, click **Skip** (not recommended).
13. On the Installation Summary screen, verify the installation options that you selected.

    If you want to save these options to a response file, click **Save Response File** and enter the response file location and name. The response file collects and stores all the information that you have entered, and enables you to perform a silent installation (from the command line) at a later time.
    Click **Install** to begin the installation.

14. On the Installation Progress screen, when the progress bar displays 100%, click **Finish** to dismiss the installer, or click **Next** to see a summary.
15. The Installation Complete screen displays the Installation Location and the Feature Sets that are installed. Review this information and click **Finish** to close the installer.
16. After you have installed Oracle Fusion Middleware Infrastructure, enter the following command to start the installer for your product distribution and repeat the steps above to navigate through the installer screens:

    (UNIX) `./fmw_12.2.1.2.0_ohs_linux64.bin`

    (Windows) `setup_fmw_12.2.1.2.0_ohs_win64.exe`

You have installed the Oracle HTTP Server in a collocated mode.

Running a Pre-Upgrade Readiness Check

To identify potential issues with the upgrade, Oracle recommends that you run a readiness check before you start the upgrade process. Be aware that the readiness check may not be able to discover all potential issues with your upgrade. An upgrade may still fail, even if the readiness check reports success.

- About Running a Pre-Upgrade Readiness Check
  You can run the Upgrade Assistant in `-readiness` mode to detect issues before you perform the actual upgrade. You can run the readiness check in GUI mode using the Upgrade Assistant or in silent mode using a response file.
- Starting the Upgrade Assistant in Readiness Mode
  Use the `-readiness` parameter to start the Upgrade Assistant in readiness mode.
- Performing a Readiness Check with the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to complete the pre-upgrade readiness check.
- Understanding the Readiness Report
  After performing a readiness check for your domain, review the report to determine whether you need to take any action for a successful upgrade.

About Running a Pre-Upgrade Readiness Check

You can run the Upgrade Assistant in `-readiness` mode to detect issues before you perform the actual upgrade. You can run the readiness check in GUI mode using the Upgrade Assistant or in silent mode using a response file.

The Upgrade Assistant readiness check performs a read-only, pre-upgrade review of your Fusion Middleware schemas and WebLogic domain configurations that are at a supported starting point. The review is a read-only operation.

The readiness check generates a formatted, time-stamped readiness report so you can address potential issues before you attempt the actual upgrade. If no issues are detected, you can begin the upgrade process. Oracle recommends that you read this report thoroughly before performing an upgrade.

You can run the readiness check while your existing Oracle Fusion Middleware domain is online (while other users are actively using it) or offline.

You can run the readiness check any number of times before performing any actual upgrade. However, do not run the readiness check after an upgrade has been performed, as the report results may differ from the result of pre-upgrade readiness checks.

> **Note:**
>
> To prevent performance from being affected, Oracle recommends that you run the readiness check during off-peak hours.

Starting the Upgrade Assistant in Readiness Mode

Use the `-readiness` parameter to start the Upgrade Assistant in readiness mode.

To perform a readiness check on your pre-upgrade environment with the Upgrade Assistant:

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant.
   - (UNIX) `./ua -readiness`
   - (Windows) `ua.bat -readiness`

   > **Note:**
   >
   > If the `DISPLAY` environment variable is not set up properly to allow for GUI mode, you may encounter the following error:
   >
   > ```
   > Xlib: connection to ":1.0" refused by server
   > Xlib: No protocol specified
   > ```
   >
   > To resolve this issue, set the `DISPLAY` environment variable to the system name or IP address of your local workstation, and rerun Upgrade Assistant.
   >
   > If you continue to receive these errors after setting `DISPLAY`, try launching another GUI tool, such as `vncconfig`. If you see the same errors, your `DISPLAY` environment variable may still not be set correctly.

   For information about other parameters that you can specify on the command line, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 4-2 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `-logLevel TRACE` is used.

Table 4-2 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-logDir` *location*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files. The default locations are: (UNIX) *NEW_ORACLE_HOME*/oracle_common/upgrade/logs *NEW_ORACLE_HOME*/oracle_common/upgrade/temp (Windows) *NEW_ORACLE_HOME*\oracle_common\upgrade\logs *NEW_ORACLE_HOME*\oracle_common\upgrade\temp
`-help`	Optional	Displays all of the command-line options.

Performing a Readiness Check with the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to complete the pre-upgrade readiness check.

Readiness checks are performed only on schemas or component configurations that are at a supported upgrade starting point.

To complete the readiness check:

1. On the Welcome screen, review information about the readiness check. Click **Next**.
2. On the Readiness Check Type screen, select the readiness check that you want to perform:
   - **Individually Selected Schemas** allows you to select individual schemas for review before upgrade. The readiness check reports whether a schema is supported for an upgrade or where an upgrade is needed.
     When you select this option, the screen name changes to Selected Schemas.
   - **Domain Based** allows the Upgrade Assistant to discover and select all upgrade-eligible schemas or component configurations in the domain specified in the **Domain Directory** field.
     When you select this option, the screen name changes to Schemas and Configuration.

   Leave the default selection if you want the Upgrade Assistant to check all schemas and component configurations at the same time, or select a specific option:

   - **Include checks for all schemas** to discover and review all components that have a schema available to upgrade.
   - **Include checks for all configurations** to review component configurations for a managed WebLogic Server domain.

   Click **Next**.

3. If you selected **Individually Selected Schemas**: On the Available Components screen, select the components that have a schema available to upgrade for which you want to perform a readiness check.

   If you selected **Domain Based**: On the Component List screen, review the list of components that are present in your domain for which you want to perform a readiness check.

   If you select a component that has dependent components, those components are automatically selected. For example, if you select Oracle Platform Security Services, Oracle Audit Services is automatically selected.

   Depending on the components you select, additional screens may display. For example, you may need to:

   - Specify the domain directory.
   - Specify schema credentials to connect to the selected schema: **Database Type**, **DBA User Name**, and **DBA Password**. Then click **Connect**.

     > **Note:**
     >
     > Oracle database is the default database type. Make sure that you select the correct database type before you continue. If you discover that you selected the wrong database type, do not go back to this screen to change it to the correct type. Instead, close the Upgrade Assistant and restart the readiness check with the correct database type selected to ensure that the correct database type is applied to all schemas.

   - Select the **Schema User Name** option and specify the **Schema Password**.

   Click **Next** to start the readiness check.

4. On the Readiness Summary screen, review the summary of the readiness checks that will be performed based on your selections.

   If you want to save your selections to a response file to run the Upgrade Assistant again later in response (or silent) mode, click **Save Response File** and provide the location and name of the response file. A silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again.

   For a detailed report, click **View Log**.

   Click **Next**.

5. On the Readiness Check screen, review the status of the readiness check. The process can take several minutes.

   If you are checking multiple components, the progress of each component displays in its own progress bar in parallel.

   When the readiness check is complete, click **Continue**.

6. On the End of Readiness screen, review the results of the readiness check (**Readiness Success** or **Readiness Failure**):
   - If the readiness check is successful, click **View Readiness Report** to review the complete report. Oracle recommends that you review the Readiness Report before you perform the actual upgrade even when the readiness check is successful. Use the **Find** option to search for a particular word or phrase within the report. The report also indicates where the completed Readiness Check Report file is located.
   - If the readiness check encounters an issue or error, click **View Log** to review the log file, identify and correct the issues, and then restart the readiness check. The log file is managed by the command-line options you set.

Understanding the Readiness Report

After performing a readiness check for your domain, review the report to determine whether you need to take any action for a successful upgrade.

The format of the readiness report file is:

```
readiness<timestamp>.txt
```

Where, *timestamp* indicates the date and time of when the readiness check was run.

A readiness report contains the following information:

Table 4-3 Readiness Report Elements

Report Information	Description	Required Action
Overall Readiness Status: SUCCESS or FAILURE	The top of the report indicates whether the readiness check passed or completed with one or more errors.	If the report completed with one or more errors, search for FAIL and correct the failing issues before attempting to upgrade. You can re-run the readiness check as many times as necessary before an upgrade.
Timestamp	The date and time that the report was generated.	No action required.
Log file location *ORACLE_HOME*/oracle_common/upgrade/logs	The directory location of the generated log file.	No action required.
Readiness report location *ORACLE_HOME*/oracle_common/upgrade/logs	The directory location of the generated readiness report.	No action required.
Names of components that were checked	The names and versions of the components included in the check and status.	If your domain includes components that cannot be upgraded to this release, such as SOA Core Extension, do not attempt an upgrade.

Table 4-3 (Cont.) Readiness Report Elements

Report Information	Description	Required Action
Names of schemas that were checked	The names and current versions of the schemas included in the check and status.	Review the version numbers of your schemas. If your domain includes schemas that cannot be upgraded to this release, do not attempt an upgrade.
Individual Object Test Status: FAIL	The readiness check test detected an issue with a specific object.	Do not upgrade until all failed issues have been resolved.
Individual Object Test Status: PASS	The readiness check test detected no issues for the specific object.	If your readiness check report shows only the PASS status, you can upgrade your environment. Note, however, that the Readiness Check cannot detect issues with externals such as hardware or connectivity during an upgrade. You should always monitor the progress of your upgrade.
Completed Readiness Check of <Object> Status: FAILURE	The readiness check detected one or more errors that must be resolved for a particular object such as a schema, an index, or datatype.	Do not upgrade until all failed issues have been resolved.
Completed Readiness Check of <Object> Status: SUCCESS	The readiness check test detected no issues.	No action required.

Here is a sample Readiness Report file. Your report may not include all of these checks.

```
Upgrade readiness check completed with one or more errors.

This readiness check report was created on Tue March 30 11:15:52 EDT
2019
Log file is located at: ORACLE_HOME/oracle_common/upgrade/logs/
ua2016-05-30-11-14-06AM.log
Readiness Check Report File: ORACLE_HOME/oracle_common/upgrade/logs/
readiness2016-05-30-11-15-52AM.txt

Starting readiness check of components.

Oracle Metadata Services
   Starting readiness check of Oracle Metadata Services.
     Schema User Name: DEV11_MDS
     Database Type: Oracle Database
     Database Connect String: machinename@yourcompany.com
     VERSION Schema DEV11_MDS is currently at version 12.2.1.4.0.
Readiness checks will now be performed.
   Starting schema test:  TEST_REQUIRED_TABLES  Test that the schema
contains all the required tables
   Completed schema test: TEST_REQUIRED_TABLES --> Test that the
schema contains all the required tables +++ PASS
   Starting schema test:  TEST_REQUIRED_PROCEDURES  Test that the
schema contains all the required stored procedures
```

```
     EXCEPTION     Schema is missing a required procedure: 
GETREPOSITORYFEATURES
   Completed schema test: TEST_REQUIRED_PROCEDURES --> Test that the schema 
contains all the required stored procedures +++ FAIL
   Starting schema test:  TEST_REQUIRED_VIEWS  Test that the schema contains 
all the required database views
   Completed schema test: TEST_REQUIRED_VIEWS --> Test that the schema 
contains all the required database views +++ PASS
   Starting index test for table MDS_ATTRIBUTES:  TEST_REQUIRED_INDEXES --> 
Test that the table contains all the required indexes
   Completed index test for table MDS_ATTRIBUTES: TEST_REQUIRED_INDEXES --> 
Test that the table contains all the required indexes +++ PASS
   Starting index test for table MDS_COMPONENTS:  TEST_REQUIRED_INDEXES --> 
Test that the table contains all the required indexes
   Completed index test for table MDS_TXN_LOCKS: TEST_REQUIRED_INDEXES --> 
Test that the table contains all the required indexes +++ PASS
   Starting schema test:  TEST_REQUIRED_TRIGGERS  Test that the schema has 
all the required triggers
   Completed schema test: TEST_REQUIRED_TRIGGERS --> Test that the schema 
has all the required triggers +++ PASS
   Starting schema test:  TEST_MISSING_COLUMNS  Test that tables and views 
are not missing any required columns
   Completed schema test: TEST_MISSING_COLUMNS --> Test that tables and 
views are not missing any required columns +++ PASS
   Starting schema test:  TEST_UNEXPECTED_TABLES  Test that the schema does 
not contain any unexpected tables
   Completed schema test: TEST_UNEXPECTED_TABLES --> Test that the schema 
does not contain any unexpected tables +++ PASS
   Starting schema test:  TEST_UNEXPECTED_PROCEDURES  Test that the schema 
does not contain any unexpected stored procedures
   Completed schema test: TEST_UNEXPECTED_PROCEDURES --> Test that the 
schema does not contain any unexpected stored procedures +++ PASS
   Starting schema test:  TEST_UNEXPECTED_VIEWS  Test that the schema does 
not contain any unexpected views
   Completed schema test: TEST_UNEXPECTED_VIEWS --> Test that the schema 
does not contain any unexpected views +++ PASS
   Starting index test for table MDS_ATTRIBUTES:  TEST_UNEXPECTED_INDEXES --
> Test that the table does not contain any unexpected indexes
   Completed index test for table MDS_ATTRIBUTES: TEST_UNEXPECTED_INDEXES --
> Test that the table does not contain any unexpected indexes +++ PASS
   Completed index test for table MDS_LABELS: TEST_UNEXPECTED_INDEXES --> 
Test that the table does not contain any unexpected indexes +++ PASS
   Starting index test for table MDS_LARGE_ATTRIBUTES:  
TEST_UNEXPECTED_INDEXES --> Test that the table does not contain any 
unexpected indexes
   Starting schema test:  TEST_UNEXPECTED_TRIGGERS  Test that the schema 
does not contain any unexpected triggers
   Completed schema test: TEST_UNEXPECTED_TRIGGERS --> Test that the schema 
does not contain any unexpected triggers +++ PASS
   Starting schema test:  TEST_UNEXPECTED_COLUMNS  Test that tables and 
views do not contain any unexpected columns
   Completed schema test: TEST_UNEXPECTED_COLUMNS --> Test that tables and 
views do not contain any unexpected columns +++ PASS
   Starting datatype test for table MDS_ATTRIBUTES:  
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the proper 
```

```
datatypes
   Completed datatype test for table MDS_ATTRIBUTES:
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the
proper datatypes +++ PASS
   Starting datatype test for table MDS_COMPONENTS:
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the
proper datatypes
   Starting permissions test:  TEST_DBA_TABLE_GRANTS  Test that DBA
user has privilege to view all user tables
   Completed permissions test: TEST_DBA_TABLE_GRANTS --> Test that DBA
user has privilege to view all user tables +++ PASS
   Starting schema test:  TEST_ENOUGH_TABLESPACE  Test that the schema
tablespaces automatically extend if full
   Completed schema test: TEST_ENOUGH_TABLESPACE --> Test that the
schema tablespaces automatically extend if full +++ PASS
   Starting schema test:  TEST_USER_TABLESPACE_QUOTA  Test that
tablespace quota for this user is sufficient to perform the upgrade
   Completed schema test: TEST_USER_TABLESPACE_QUOTA --> Test that
tablespace quota for this user is sufficient to perform the upgrade ++
+ PASS
   Starting schema test:  TEST_ONLINE_TABLESPACE  Test that schema
tablespaces are online
   Completed schema test: TEST_ONLINE_TABLESPACE --> Test that schema
tablespaces are online +++ PASS
   Starting schema test:  TEST_DATABASE_VERSION  Test that the
database server version number is supported for upgrade
     INFO   Database product version: Oracle Database 12c Enterprise
Edition Release 12.2.1.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
   Completed schema test: TEST_DATABASE_VERSION --> Test that the
database server version number is supported for upgrade +++ PASS
   Finished readiness check of Oracle Metadata Services with status:
FAILURE.
```

If you are running the 12.1.3.0 version of Oracle Fusion Middleware IAU Schemas, and those schemas were upgraded from 11*g* (11.1.1.7 and later) or 12*c* (12.1.2.0), your readiness check may fail with the following error:

```
Starting index test for table IAU_COMMON:  TEST_REQUIRED_INDEXES --> Test
that the table contains all the required indexes
     INFO Audit schema index DYN_EVENT_CATEGORY_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_EVENT_TYPE_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_TENANT_INDEX in table IAU_COMMON is missing
the required columns or index itself is missing. This maybe caused by a known
issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_USER_INDEX in table IAU_COMMON is missing
the required columns or index itself is missing. This maybe caused by a known
issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_COMPONENT_TYPE_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
```

```
     INFO Audit schema index DYN_USER_TENANT_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
   Completed index test for table IAU_COMMON: TEST_REQUIRED_INDEXES --> Test
that the table contains all the required indexes +++ FAIL
```

> **Note:**
>
> You can ignore the missing index error in the readiness report. This is a known issue. The corresponding missing index is added during the schema upgrade operation. This error does not occur if the schema to be upgraded was created in 12*c* (12.2.1.3.0) by using the RCU.

Stopping Servers and Processes

Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.

An Oracle Fusion Middleware environment can consist of an Oracle WebLogic Server domain, an Administration Server, multiple managed servers, Java components, system components such as Identity Management components, and a database used as a repository for metadata. The components may be dependent on each other, so they must be stopped in the correct order.

> **Note:**
>
> The procedures in this section describe how to stop the existing, pre-upgrade servers and processes using the WLST command-line utility or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager.

To stop your pre-upgrade Fusion Middleware environment, navigate to the pre-upgrade domain and follow the steps below:

Step 1: Stop System Components

To stop system components, such as Oracle HTTP Server, use the `stopComponent` script:

- (UNIX) *EXISTING_DOMAIN_HOME*/bin/stopComponent.sh *component_name*
- (Windows) *EXISTING_DOMAIN_HOME*\bin\stopComponent.cmd *component_name*

You can stop system components in any order.

Step 2: Stop the Managed Servers

To stop a WebLogic Server Managed Server, use the `stopManagedWebLogic` script:

- (UNIX) *EXISTING_DOMAIN_HOME*/bin/stopManagedWebLogic.sh *managed_server_name admin_url*

- (Windows) *EXISTING_DOMAIN_HOME*`\bin\stopManagedWebLogic.cmd` *`managed_server_name admin_url`*

When prompted, enter your user name and password.

Step 3: Stop Oracle Identity Management Components

Stop any Oracle Identity Management components, such as Oracle Internet Directory:

- (UNIX) *EXISTING_DOMAIN_HOME*`/bin/stopComponent.sh` *`component_name`*
- (Windows) *EXISTING_DOMAIN_HOME*`\bin\stopComponent.cmd` *`component_name`*

Step 4: Stop the Administration Server

When you stop the Administration Server, you also stop the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To stop the Administration Server, use the `stopWebLogic` script:

- (UNIX) *EXISTING_DOMAIN_HOME*`/bin/stopWebLogic.sh`
- (Windows) *EXISTING_DOMAIN_HOME*`\bin\stopWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 5: Stop Node Manager

To stop Node Manager, close the command shell in which it is running.

Alternatively, after setting the `nodemanager.properties` attribute `QuitEnabled` to `true` (the default is `false`), you can use WLST to connect to Node Manager and shut it down. See stopNodeManager in *WLST Command Reference for WebLogic Server*.

Creating the Required 12c Schemas with the RCU

When upgrading, you must create the required schemas. You can use the Repository Creation Utility (RCU) to create customized schemas or, optionally, you can use the Upgrade Assistant to create schemas using the default schema settings. This procedure describes how to create schemas using the RCU. Information about using the Upgrade Assistant to create schemas is covered in the upgrade procedures.

> **Note:**
>
> If you are upgrading from a previous 12c release of Oracle Fusion Middleware, you do not need to re-create these schemas if they already exist. Refer to the steps below to identify the existing schemas in your domain.

The following schemas must exist before you upgrade. If you are upgrading from 12c, and you are not sure which schemas you currently have, refer to the steps below to identify the existing schemas in your domain. You do not need to re-create these schemas if they already exist.

- **Service Table** schema (*prefix*_STB). This schema is required for domain-based upgrades. It stores basic schema configuration information (for example, schema prefixes and passwords) that can be accessed and used by other Oracle Fusion Middleware components during the domain creation. This schema is automatically created when you run the Repository Creation Utility (RCU), where you specify the existing schema owner prefix that you used for your other 12c schemas.

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

- **Oracle Platform Security Services (OPSS)** schema (*prefix*_OPSS). This schema is required if you are using an OID-based security store in 12c. This schema is automatically created when you run the Repository Creation Utility (RCU). The only supported LDAP-based OPSS security store is Oracle Internet Directory (OID). An LDAP-based policy store is typically used in production environments. You do not need to reassociate an OID-based security store before upgrade. While the Upgrade Assistant is running, you can 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.

To create the schemas with the RCU:

1. (Optional) If you are upgrading from 12c, and you wish to confirm the schemas which are present in your existing domain, then connect to the database as a user with DBA privileges, and run the following code from SQL*Plus:

   ```
   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 ;
   ```

2. Verify that a certified JDK already exists on your system by running `java -version` from the command line. For 12*c* (12.2.1.3.0), the certified JDK is 1.8.0_131 and later.

   Ensure that the `JAVA_HOME` environment variable is set to the location of the certified JDK. For example:

   - (UNIX) `setenv JAVA_HOME=/home/Oracle/Java/jdk1.8.0_131`
   - (Windows) `set JAVA_HOME=C:\home\Oracle\Java\jdk1.8.0_131`

Add `$JAVA_HOME/bin` to `$PATH`.

3. Go to the `oracle_common/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\bin`
4. Start the RCU:
   - (UNIX) `./rcu`
   - (Windows) `rcu.bat`
5. On the Welcome screen, click **Next**.
6. On the Create Repository screen, select **Create Repository** and then select **System Load and Product Load**.

   If you do not have DBA privileges, select **Prepare Scripts for System Load**. This will generate a SQL script containing all the same SQL statements and blocks that would have been called if the RCU were to execute the actions for the selected components. After the script is generated, a user with the necessary SYS or SYSDBA privileges can execute the script to complete the system load phase. Click **Next**.
7. On the Database Connection Details screen, select the **Database Type** and enter the connection information for the database that hosts the 12c schemas. See the pertinent table below.

Table 4-4 Connection Credentials for Oracle Databases and Oracle Databases with Edition-Based Redefinition

Option	Description and Example
Host Name	Specify the name of the server where your database is running in the following format: `examplehost.exampledomain.com` For Oracle RAC databases, specify the VIP name or one of the node names in this field.
Port	Specify the port number for your database. The default port number for Oracle databases is `1521`.
Service Name	Specify the service name for the database. Typically, the service name is the same as the global database name. For Oracle RAC databases, specify the service name of one of the nodes in this field. For example: `examplehost.exampledomain.com`
Username	Enter the user name for your database. The default user name is `SYS`.
Password	Enter the password for your database user.
Role	Select the database user's role from the drop-down list: **Normal** or **SYSDBA**

Table 4-5 Connection Credentials for MySQL Databases

Option	Description and Example
Host Name	Specify the host name, IP address, or complete server name in *host\server* format of the server where your database is running.
Port	Specify the port number for your database.
Database Name	Specify the name of your database.
Username	Specify the name of a user with administrator privileges.
Password	Enter the password for your database user.

Table 4-6 Connection Credentials for Microsoft SQL Server Databases

Option	Description and Example
Unicode Support	Select **Yes** or **No** from the drop-down list.
Server Name	Specify the host name, IP address, or complete server name in *host\server* format of the server where your database is running. MSSQL named instances: A named instance is identified by the network name of the computer and the instance name that you specify during installation. The client must specify both the server name and the instance name when connecting.
Port	Specify the port number for your database.
Database Name	Specify the name of your database.
Username	Specify the name of a user with administrator privileges.
Password	Enter the password for your database user.

Table 4-7 Connection Credentials for IBM DB2 Databases

Option	Description and Example
Server Name	Specify the host name, IP address, or complete server name in *host\server* format of the server where your database is running.
Port	Specify the port number for your database.
Database Name	Specify the name of your database.
Username	Specify the name of a user with DB Owner privileges. The default user name for IBM DB2 databases is `db2inst1`.
Password	Enter the password for your database user.

If the prerequisite check is successful, click **OK** to continue to the next screen. If the check fails, review the details you entered and try again.

8. On the Select Components screen, select **Select existing prefix** and select the prefix that was used to create the existing 11*g* schemas from the drop-down menu (for example, `DEV11G`). This prefix is used to logically group schemas together for use in this domain.

   Select **AS Common Schemas**.

> **Note:**
>
> The Common Infrastructure Services (`*prefix*_STB`) and Oracle Platform Security Services (`*prefix*_OPSS`) schemas are selected by default if they have not yet been created.

Make a note of the prefix and schema names for the components you are installing as you will need this information when you configure the installation. Click **Next**.

9. In the Checking Prerequisites dialog, verify that the prerequisites check is successful, then click **OK**.
10. On the Schema Passwords screen, specify the passwords for your schema owners.

    Make a note of the passwords you enter on this screen as you will need this information while configuring your product installation.
11. On the Map Tablespaces screen, configure the required tablespace mapping for the schemas you want to create.

    Click **Next**, then click **OK** in the confirmation dialog. When the progress dialog shows the tablespace creation is complete, click **OK**.

    You see the **Encrypt Tablespace** check box only if you have enabled Transparent Data Encryption (TDE) in the database (Oracle or Oracle EBR) when you start the RCU. Select the **Encrypt Tablespace** check box on the Map Tablespaces screen to encrypt all new tablespaces that the RCU creates.
12. Verify the information on the Summary screen and click **Create** to begin schema creation.

    This screen contains information about the log files that were created from this RCU operation. Click on the name of a particular log file to view the contents of that file.
13. Review the information on the Completion Summary screen to verify that the operation is completed successfully. Click **Close** to complete the schema creation.

About Reconfiguring the Domain

Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).

When you reconfigure a standalone domain, the following items are automatically updated, depending on the applications in the domain:

- WebLogic Server 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 version of the target Oracle HTTP Server.
- The reconfiguration template for Oracle HTTP Server is automatically selected and applied to the domain. This template defines any reconfiguration tasks that are required to make the standalone domain compatible with the target Oracle HTTP Server version.
- The start scripts are updated.

  If you want to preserve your modified start scripts, be sure to back them up before starting the Reconfiguration Wizard.

> **Note:**
>
> When the domain reconfiguration process starts, you can’t undo the changes that it makes. Before running the Reconfiguration Wizard, ensure that you have backed up the domain as covered in the pre-upgrade checklist. 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 before reconfiguration.

Follow these instructions to reconfigure the existing domain using the Reconfiguration Wizard. See Reconfiguring WebLogic Domains in *Upgrading Oracle WebLogic Server*.

- Backing Up the Domain
- Starting the Reconfiguration Wizard
- Reconfiguring the Domain with the Reconfiguration Wizard
  Navigate through the screens in the Reconfiguration Wizard to reconfigure your existing domain.

Backing Up the Domain

Before running the Reconfiguration Wizard, create a backup copy of the domain directory.

To create a backup of the domain directory:

1. Copy the source domain to a separate location to preserve the contents.

   (Windows) `copy C:\domains\mydomain to C:\domains\mydomain_backup`.

   (UNIX) `cp mydomain /domains/mydomain_backup`
2. Before updating the domain on each remote Managed Server, create 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 before reconfiguration.

Starting the Reconfiguration Wizard

> **Note:**
>
> Shut down the administration server and all collocated managed servers before starting the reconfiguration process. See Stopping Servers and Processes .

To start the Reconfiguration Wizard in graphical mode:

1. Sign 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. Go to the `oracle_common/common/bin` directory:
   - (UNIX) `NEW_ORACLE_HOME/oracle_common/common/bin`
   - (Windows) `NEW_ORACLE_HOME\oracle_common\commom\bin`
4. Start the Reconfiguration Wizard with the following logging options:
   - (UNIX) `./reconfig.sh -log=log_file -log_priority=ALL`
   - (Windows) `reconfig.cmd -log=log_file -log_priority=ALL`

   where `log_file` is 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 this command, the following error message might appear 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
   > ```

Reconfiguring the Domain with the Reconfiguration Wizard

Navigate through the screens in the Reconfiguration Wizard to reconfigure your existing domain.

To reconfigure the domain:

1. On the Select Domain screen, specify the location of the domain you want to upgrade or click **Browse** to navigate and select the domain directory. Click **Next**.

2. On the Reconfiguration Setup Progress screen, view the progress of the setup process. When complete, click **Next**.

   During this process:

   - The reconfiguration templates for your installed products, including Fusion Middleware products, are automatically applied. This updates various domain configuration files such as `config.xml`, `config-groups.xml`, and `security.xml` (among others).
   - Schemas, scripts, and other such files that support your Fusion Middleware products are updated.
   - The domain upgrade is validated.

3. On the Domain Mode and JDK screen, select the JDK to use in the domain or click **Browse** to navigate to the JDK you want to use. The supported JDK version for 12*c* (12.2.1.3.0) is 1.8.0_131 and later. Click **Next**.

   > **Note:**
   >
   > You cannot change the **Domain Mode** at this stage.

   For a list of JDKs that are supported for a specific platform, see Oracle Fusion Middleware Supported System Configurations.

4. On the JDBC Data Sources screen, configure the JDBC data sources defined in your domain source.

   The JDBC data sources associated with the products for which you are creating the domain are listed in the lower half of the screen. A JDBC data source contains a pool of database connections that are created when the data source instance is created, deployed or targeted, or at server startup. Applications look up a data source on the JNDI tree, and then request a connection. When the applications no longer need the connections, they return the connections to the connection pool in the data source.

   From the **Data Source Name** drop-down list, select the data source(s) for which you want to specify the settings. The values that you specify are displayed in the appropriate columns in the data source list, for the selected data source.

   For Oracle RAC Configuration for data sources, you can select one of the three options:

   - Convert to GridLink
   - Convert to RAC multi data source
   - Don’t convert

   For more information about each option, click **Help**.

   After specifying the details, click **Next**.

   If you do not select any data sources on the JDBC Data Sources screen, the following warning displays:

   ```
   Missing Driver
   ```

   ```
   Click Ok to proceed without verification, click Cancel to return
   to the JDBC Data Sources page.
   ```

   In this case, if you click **Ok**, the data sources are not verified.

5. On the JDBC Data Sources Test screen, select the check box for the data source connection you configured on the JDBC Data Sources screen and click **Test Selected Connections** to test the data source connection.

   > **Note:**
   >
   > To test the database connections, the database to which you are connecting must be running. If you do not want to test the connections at this time, do not select any data sources. Click **Next** to continue.

6. On the Database Configuration Type screen, select **RCU Data** to connect to the Server Table (_STB) schema.

   Enter the database connection details using the RCU service table (_STB) schema credentials and click **Get RCU Configuration**.

   The Reconfiguration Wizard uses this connection to automatically configure the data sources required for components in your domain.

   > **Note:**
   >
   > By default **Oracle's Driver (Thin) for Service connections; Versions: Any** is the selected driver. If you specified an instance name in your connection details — instead of the service name — you must select **Oracle's Driver (Thin) for pooled instance connections; Versions: Any** If you do not change the driver type, then the connection will fail.

   > **Note:**
   >
   > For any existing 12*c* (12.2.1.2.0) datasource, the reconfiguration will preserve the existing values. For new datasources where the schema was created for 12*c* (12.2.1.3.0) by the RCU, the default connection data will be retrieved from the _STB schema. If no connection data for a given schema is found in the _STB schema, then the default connection data is used.

   If the check is successful, click **Next**. If the check fails, reenter the connection details correctly and try again.

   > **Note:**
   >
   > If you are upgrading from 12*c* (12.2.1.2.0), and your database has _OPSS or _IAU 12*c* (12.2.1.2.0) database schemas, you must manually enter database connection details for those schemas. These schemas were not required in 12c and had to be created manually. Users could assign any name to these schemas, therefore the Reconfiguration Wizard does not recognize them. When providing connection information for _IAU, use the IAU_APPEND user information.

7. On the JDBC Component Schema Test screen, select all the component schemas and click **Test Selected Connections** to test the connection for each schema. The result of the test is indicated in the Status column.

   When the check is complete, click **Next**.

8. The Node Manager screen is only displayed if the domain you are reconfiguring is currently using a per host Node Manager.

   On the Node Manager screen, 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**.

Table 4-8   Field Descriptions for Node Manager Screen

Option	Description
Per Domain Default Location	If you select this option, the Node Manager home is redefined to `*DOMAIN_NAME*/nodemanager` and you cannot edit the Node Manager home.
Per Domain Custom Location	Select this option if you want the per domain Node Manager configuration files to be created in a specific location for this domain. Specify the directory in the **Node Manager Home** field, or click **Browse** to use the navigation tree to select the location. The specified directory must be empty. The nodemanager.properties and nodemanager.domains files are created in this directory.
Node Manager Home	If you selected the **Per Domain Custom Location** option, click **Browse** to navigate to the directory location that you want to use to store the per domain Node Manager configuration.
Manual Node Manager Setup	If you select this option, creation of the Node Manager configuration for the domain is skipped (all remaining fields cannot be modified), and if you want to use Node Manager in the domain, you must manually configure Node Manager as described in Completing the Node Manager Configuration. The reconfigured domain will still use a per host Node Manager configuration. You should also select this option if your existing domain is not configured to use Node Manager and you do not want to use Node Manager in the reconfigured domain. For more information about Node Manager configuration, see Administering Node Manager for Oracle WebLogic Server.
Node Manager Configuration	Select one of the following two options. These fields are not available if you selected **Manual Node Manager Setup**.
Create New Configuration	A per domain Node Manager configuration will be automatically created for the reconfigured domain using default settings in nodemanager.properties. If necessary, you can modify nodemanager.properties after the domain has been successfully reconfigured.

Table 4-8 (Cont.) Field Descriptions for Node Manager Screen

Option	Description
Migrate Existing Configuration	The existing per host Node Manager configuration will be migrated to a per domain configuration for the reconfigured domain. This does not include environment-specific settings for ListenAddress, ListenPort, StartScriptName, JavaHome, and LogFile.
Node Manager Home	If you selected the **Migrate Existing Configuration** option, enter or browse to the Node Manager home directory that you want to migrate to the reconfigured domain.

Apply Oracle Recommended Defaults	If you selected the **Migrate Existing Configuration** option, select this check box if you want to use Oracle-recommended defaults in the nodemanager.properties file. Deselect this check box if you want to continue using the settings in the nodemanager.properties file being migrated.
	Oracle-recommended properties with default values are as follows:
	`LogLimit=0`
	`AuthenticationEnabled=true`
	`LogLevel=INFO`
	`DomainsFileEnabled=true`
	`NativeVersionEnabled=true`
	`LogToStderr=true`
	`SecureListener=true`
	`LogCount=1`
	`StopScriptEnabled=false`
	`QuitEnabled=false`
	`LogAppend=true`
	`StateCheckInterval=500`
	`CrashRecoveryEnabled=false`
	`StartScriptEnabled=true`
	`LogFormatter=weblogic.nodemanager.server.LogFormatter`
	`ListenBacklog=50`

Node Manager Credentials: Username, Password	Specify the username and password that you want to use to start Node Manager in the reconfigured domain.

9. On the Advanced Configuration screen, you can select all categories for which you want to perform advanced configuration. For each category you select, the appropriate configuration screen is displayed to allow you to perform advanced configuration.

> **Note:**
>
> The categories that are listed on the Advanced Configuration screen depend on the resources defined in the templates you selected for the domain.

For this upgrade, select none of the options and click **Next**.

10. On the Configuration Summary screen, review the detailed configuration settings of the domain before continuing.

    You can limit the items that are displayed in the right-most panel by selecting a filter option from the **View** drop-down list.

    To change the configuration, click **Back** to return to the appropriate screen. To reconfigure the domain, click **Reconfig**.

    > **Note:**
    >
    > The location of the domain does not change when you reconfigure it.

11. The Reconfiguration Progress screen displays the progress of the reconfiguration process.

    During this process:

    - Domain information is extracted, saved, and updated.
    - Schemas, scripts, and other such files that support your Fusion Middleware products are updated.

    When the progress bar shows 100%, click **Next**.

12. The End of Configuration screen indicates whether the reconfiguration process completed successfully or failed. It also displays the location of the domain that was reconfigured as well as the Administration Server URL (including the listen port). If the reconfiguration is successful, it displays **Oracle WebLogic Server Reconfiguration Succeeded**.

    If the reconfiguration process did not complete successfully, an error message is displayed indicates the reason. Take appropriate action to resolve the issue. If you cannot resolve the issue, contact My Oracle Support.

    Note the Domain Location and the Admin Server URL for further operations.

Upgrading Domain Component Configurations

After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.

- Starting the Upgrade Assistant
  Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).
- Upgrading Domain Components Using the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.
- Verifying the Domain-Specific-Component Configurations Upgrade
  To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

Starting the Upgrade Assistant

Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

To start the Upgrade Assistant:

> **Note:**
>
> Before you start the Upgrade Assistant, make sure that the JVM character encoding is set to UTF-8 for the platform on which the Upgrade Assistant is running. If the character encoding is not set to UTF-8, then you will not be able to download files containing Unicode characters in their names. This can cause the upgrade to fail.

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) `NEW_ORACLE_HOME/oracle_common/upgrade/bin`
   - (Windows) `NEW_ORACLE_HOME\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant:
   - (UNIX) `./ua`
   - (Windows) `ua.bat`

For information about other parameters that you can specify on the command line, such as logging parameters, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 4-9 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.

Table 4-9 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `–logLevel TRACE` is used.

Table 4-9 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Upgrading Domain Components Using the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.

After running the Reconfiguration Wizard to reconfigure the WebLogic domain to 12*c* (12.2.1.3.0), you must run the Upgrade Assistant to upgrade the domain *component* configurations to match the updated domain configuration.

To upgrade domain component configurations with the Upgrade Assistant:

1. On the Welcome screen, review an introduction to the Upgrade Assistant and information about important pre-upgrade tasks. Click **Next**.

   > **Note:**
   >
   > For more information about any Upgrade Assistant screen, click **Help** on the screen.

2. On the WebLogic Components screen, select the **WebLogic Component Configurations** option to upgrade component configurations for a managed WebLogic Server domain. Enter the connection details required to connect to the WebLogic Administration Server that is managing the domain and click **Next**.
3. On the Component List screen, verify that the list includes all the components for which you want to upgrade configurations and click **Next**.

If you do not see the components you want to upgrade, click **Back** to go to the previous screen and specify a different domain.

4. On the Prerequisites screen, acknowledge that the prerequisites have been met by selecting all the check boxes. Click **Next**.

   > **Note:**
   >
   > The Upgrade Assistant does not verify whether the prerequisites have been met.

5. On the Examine screen, review the status of the Upgrade Assistant as it examines each component, verifying that the component configuration is ready for upgrade. If the status is **Examine finished**, click **Next**.

   If the examine phase fails, Oracle recommends that you cancel the upgrade by clicking **No** in the Examination Failure dialog. Click **View Log** to see what caused the error and refer to Troubleshooting Your Upgrade in *Upgrading with the Upgrade Assistant* for information on resolving common upgrade errors.

   > **Note:**
   >
   > - If you resolve any issues detected during the examine phase without proceeding with the upgrade, you can start the Upgrade Assistant again without restoring from backup. However, if you proceed by clicking **Yes** in the Examination Failure dialog box, you need to restore your pre-upgrade environment from backup before starting the Upgrade Assistant again.
   > - Canceling the examination process has no effect on the configuration data; the only consequence is that the information the Upgrade Assistant has collected must be collected again in a future upgrade session.

6. On the Upgrade Summary screen, review the summary of the options you have selected for component configuration upgrade.

   The response file collects and stores all the information that you have entered, and enables you to perform a silent upgrade at a later time. The silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again. If you want to save these options to a response file, click **Save Response File** and provide the location and name of the response file.

   Click **Upgrade** to start the upgrade process.

7. On the Upgrade Progress screen, monitor the status of the upgrade.

   > **Caution:**
   >
   > Allow the Upgrade Assistant enough time to perform the upgrade. Do not cancel the upgrade operation unless absolutely necessary. Doing so may result in an unstable environment.

If any components are not upgraded successfully, refer to the Upgrade Assistant log files for more information.

> **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.

Click **Next**.

8. If the upgrade is successful: On the Upgrade Success screen, click **Close** to complete the upgrade and close the wizard. The Post-Upgrade Actions window describes the manual tasks you must perform to make components functional in the new installation. This window appears only if a component has post-upgrade steps.

   If the upgrade fails: On the Upgrade Failure screen, click **View Log** to view and troubleshoot the errors. The logs are available at `*NEW_ORACLE_HOME*/oracle_common/upgrade/logs`.

   > **Note:**
   >
   > If the upgrade fails you must restore your pre-upgrade environment from backup, fix the issues, then restart the Upgrade Assistant.

Verifying the Domain-Specific-Component Configurations Upgrade

To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

To sign in to the Administration Console, go to: `http://`*`administration_server_host`*`:`*`administration_server_port`*`/console`

To sign in to Oracle Enterprise Manager Fusion Middleware Control Console, go to: `http://`*`administration_server_host`*`:`*`administration_server_port`*`/em`

> **Note:**
>
> After upgrade, make sure you run the administration tools from the new 12*c* (12.2.1.3.0) Oracle home directory and not from the previous Oracle home directory.
>
> During the upgrade process, some OWSM documents, including policy sets and predefined documents such as policies and assertion templates, may need to be upgraded. If a policy set or a predefined document is upgraded, its version number is incremented by 1.
>
> If you created the FMW user to run the Upgrade Assistant, ensure that you delete the account after verifying your upgrade was successful.

Starting Servers and Processes

After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.

The components may be dependent on each other so they must be started in the correct order.

> **Note:**
>
> The procedures in this section describe how to start servers and process using the WLST command line or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager in *Administering Oracle Fusion Middleware.*

To start your Fusion Middleware environment, follow the steps below:

Step 1: Start the Administration Server

When you start the Administration Server, you also start the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To start the Administration Server, use the `startWebLogic` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startWebLogic.sh`
- (Windows) `NEW_DOMAIN_HOME\bin\startWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 2: Start Node Manager

To start Node Manager, use the `startNodeManager` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startNodeManager.sh`
- (Windows) `NEW_DOMAIN_HOME\bin\startNodeManager.cmd`

Step 3: Start Oracle Identity Management Components

Start any Oracle Identity Management components, such as Oracle Internet Directory, that form part of your environment:

- (UNIX) `NEW_DOMAIN_HOME/bin/startComponent.sh component_name`
- (Windows) `NEW_DOMAIN_HOME\bin\startComponent.cmd component_name`

Step 4: Start the Managed Servers

To start a WebLogic Server Managed Server, use the `startManagedWebLogic` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startManagedWebLogic.sh managed_server_name admin_url`
- (Windows) `NEW_DOMAIN_HOME\bin\startManagedWebLogic.cmd managed_server_name admin_url`

When prompted, enter your user name and password.

> **Note:**
>
> The startup of a Managed Server will typically start the applications that are deployed to it. Therefore, it should not be necessary to manually start applications after the Managed Server startup.

Step 5: Start System Components

To start system components, such as Oracle HTTP Server, use the `startComponent` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startComponent.sh component_name`
- (Windows) `NEW_DOMAIN_HOME\bin\startComponent.cmd component_name`

You can start system components in any order.

- Starting the Oracle HTTP Server
  You can use Enterprise Manager Fusion Middleware Control to start, stop, and restart Oracle HTTP Server.

Starting the Oracle HTTP Server

You can use Enterprise Manager Fusion Middleware Control to start, stop, and restart Oracle HTTP Server.

You can start the Oracle HTTP Server with the Node Manager by following the procedure mentioned in Running Oracle HTTP Server Remotely in *Administering Oracle HTTP Server*.

To start an Oracle HTTP Server using Enterprise Manager Fusion Middleware Control:

1. Go to the Oracle HTTP Server home page.
2. From the Oracle HTTP Server menu:
   a. Select **Control**.

   b. Select **Start Up** from the **Control** menu.

   Or

3. From the Target Navigation tree:
   a. Right-click the Oracle HTTP Server instance you want to start.
   b. Select **Control**.
   c. Select **Start Up** from the **Control** menu.

Verifying the Upgrade

If you can log in to the Administration Console, the Enterprise Manager Fusion Middleware Control, and the OHS Home Page, then your upgrade is successful.

To verify the upgrade:

1. Access the OHS default home page by using the following URL:

   http://*MachineName*:7777

2. Access Enterprise Manager Fusion Middleware Control by using the following URL:

   http://*MachineName*:7001/em

Importing Wallets to the KSS Database after an Upgrade Using WLST

When you use Upgrade Assistant to upgrade from a previous version of Oracle HTTP Server to 12*c* (12.2.1.3.0), you must perform an additional wallet management task.

Use the `ohs_postUpgrade` command to import the wallets for Oracle HTTP Server instances to the KSS database.

This command parses across all of the Oracle HTTP Server instances in the domain and imports the wallets to the KSS database if an entry does not already exist in the database against the same keystore name. See ohs_postUpgrade.

1. Start WLST from the command line.

   (UNIX) `ORACLE_HOME/oracle_common/common/bin/wlst.sh`

   (Windows) `ORACLE_HOME\oracle_common\common\/bin\wlst.cmd`

2. Connect to the Administration Server instance:

   ```
   connect('<userName>', '<password>', '<host>:<port>')
   ```

3. Enter the `ohs_postUpgrade` WLST custom command, for example:

   ```
   ohs_postUpgrade()
   ```

Part II

Upgrading Oracle HTTP Server from a Previous 12*c* Release

Part II contains the following chapters:

5 Upgrading a Standalone Oracle HTTP Server from a Previous 12*c* Release

This chapter describes the process to upgrade a Standalone Oracle HTTP Server to the latest 12*c* from a previous Standalone Oracle HTTP Server 12*c* release.

> **Note:**
>
> The information in this chapter assumes that you have read and performed the required pre-upgrade tasks listed in Planning an Upgrade to Oracle Fusion Middleware 12*c* (12.2.1.3.0) in *Planning an Upgrade of Oracle Fusion Middleware*.

This chapter contains the following sections:

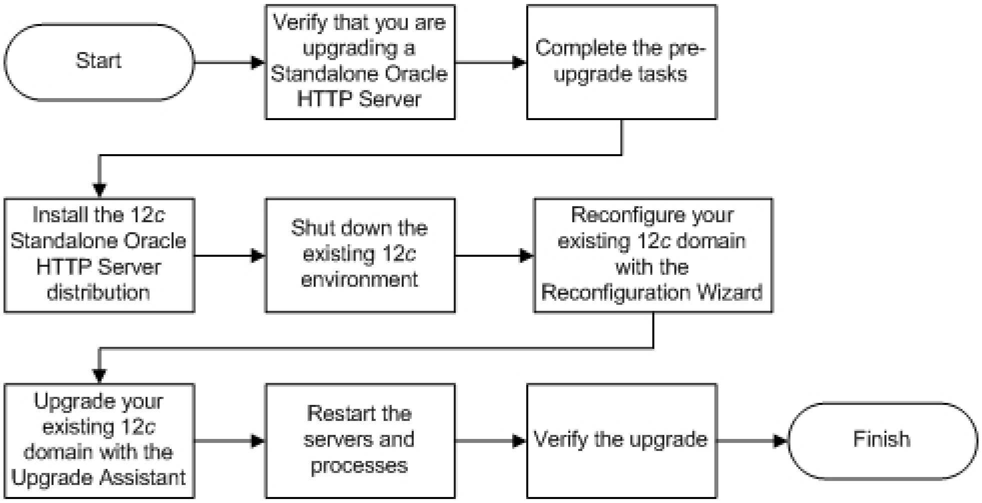
- About the Standalone Oracle HTTP Server Upgrade Process from a Previous 12c Release
  Review the flowchart and roadmap for an overview of the upgrade process for Oracle HTTP Server.
- Installing the Standalone Oracle HTTP Server
  Before you begin your upgrade, download the Oracle HTTP Server 12*c* (12.2.1.3.0) distribution on the target system and install it by using the Oracle Universal Installer.
- Stopping Servers and Processes
  Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.
- About Reconfiguring the Domain
  Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).
- Upgrading Standalone System Component Configurations
  Use the Upgrade Assistant to upgrade the standalone agent's component configurations when the agent is managed by OPMN. The standalone component configuration upgrade does not support upgrade of a standalone agent that is not managed by OPMN.
- Verifying the Upgrade
  You can verify that the upgrade is successful if you are able to start the Node Manager and the Standalone Oracle HTTP Server properly.
- Starting Servers and Processes
  After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.

About the Standalone Oracle HTTP Server Upgrade Process from a Previous 12*c* Release

Review the flowchart and roadmap for an overview of the upgrade process for Oracle HTTP Server.

Figure 5-1 shows the high-level procedures associated with a standalone Oracle HTTP Server upgrade when the starting point is another 12*c* release. The tools used for each step are also listed.

Figure 5-1 Upgrade Process Flowchart for Standalone Oracle HTTP Server from a Previous 12*c* release


Start
Verify that you are upgrading a Standalone Oracle HTTP Server
Complete the pre-upgrade tasks
Install the 12c Standalone Oracle HTTP Server distribution
Shut down the existing 12c environment
Reconfigure your existing 12c domain with the Reconfiguration Wizard
Upgrade your existing 12c domain with the Upgrade Assistant
Restart the servers and processes
Verify the upgrade
Finish

The following table describes the tasks that must be completed to upgrade a standalone Oracle HTTP Server from a previous release of 12*c* to the latest version.

Table 5-1 Tasks for Upgrading Standalone Oracle HTTP Server from a Previous 12*c* Release

Task	Description
Required Verify that you are upgrading a standalone Oracle HTTP Server.	To determine which Oracle HTTP Server you have in your existing environment, see Determining whether Oracle HTTP Server is Standalone or Managed (Collocated).
Required Complete the pre-upgrade tasks.	The pre-upgrade tasks include cloning your production environment, verifying system requirements and certifications, purging unused data, and creating a non-SYSDBA user. For a complete list of pre-upgrade tasks, see Preparing to Upgrade Oracle HTTP Server.

Table 5-1 (Cont.) Tasks for Upgrading Standalone Oracle HTTP Server from a Previous 12*c* Release

Task	Description
Required Install the Standalone Oracle HTTP Server.	Run the installation program to install the software. Select the installation type **Standalone Oracle HTTP Server (managed independently of WebLogic server)**. This transfers the software to your system and creates a new Oracle home directory. See Installing the Standalone Oracle HTTP Server.
Required Shut down the 12*c* environment.	See Stopping Servers and Processes .
Required Reconfigure your existing domain.	Run the Reconfiguration Wizard from 12*c* Oracle HTTP Server installation to reconfigure the existing domain. See About Reconfiguring the Domain.
Required Upgrade the standalone system component configurations.	See Upgrading Standalone System Component Configurations.
Required Restart the servers and processes.	See Starting Servers and Processes.
Required Verify the upgrade.	Your Oracle HTTP Server should continue to function as expected. If you have post-upgrade issues, you should troubleshoot the installation and retry the upgrade. See Troubleshooting Oracle HTTP Server in *Administering Oracle HTTP Server*.

Installing the Standalone Oracle HTTP Server

Before you begin your upgrade, download the Oracle HTTP Server 12*c* (12.2.1.3.0) distribution on the target system and install it by using the Oracle Universal Installer.

To install the standalone Oracle HTTP Server:

1. Sign in to the target system.
2. Download the following from Oracle Technology Network or Oracle Software Delivery Cloud to your target system:

   Oracle HTTP Server (UNIX: `fmw_12.2.1.2.0_ohs_linux64.bin`), (Windows: `setup_fmw_12.2.1.2.0_ohs_win64.exe`
3. Change to the directory where you downloaded the 12*c* (12.2.1.3.0) product distribution.
4. Check that your machine meet the following requirements:
   - Ensure that the system, patch, kernel, and other requirements are met as specified in theRoadmap for Verifying Your System Environment.
   - Because Oracle HTTP Server is installed by default on port 7777, you must ensure that port 7777 is not used by any service on the nodes. To check if this port is in use, run the following command before you install Oracle HTTP Server. You must free the port if it is in use.

     ```
     netstat -an | grep 7777
     ```

5. Enter the following command to start the installation program:

   (UNIX) `./fmw_12.2.1.2.0_ohs_linux64.bin`

   (Windows) `setup_fmw_12.2.1.2.0_ohs_win64.exe`

6. On UNIX operating systems, the Installation Inventory Setup screen appears if this is the first time you are installing an Oracle product on this host.

   Specify the location where you want to create your central inventory. Make sure that the operating system group name selected on this screen has write permissions to the central inventory location, and click **Next**.

   > **Note:**
   >
   > The Installation Inventory Setup screen does not appear on Windows operating systems.

7. On the Welcome screen, review the information to make sure that you have met all the prerequisites. Click **Next.**

8. On the Auto Updates screen, select an option:

   - **Skip Auto Updates**: If you do not want your system to check for software updates at this time.
   - **Select patches from directory**: To navigate to a local directory if you downloaded patch files.
   - **Search My Oracle Support for Updates**: To automatically download software updates if you have a My Oracle Support account. You must enter Oracle Support credentials then click **Search**. To configure a proxy server for the installer to access My Oracle Support, click **Proxy Settings**. Click **Test Connection** to test the connection.

   Click **Next**.

9. On the Installation Location screen, specify the location for the Oracle home directory and click **Next**.

   As you are installing the standard installation topology for Oracle HTTP Server in a standalone domain, you can specify an Oracle home directory of your choice. However, ensure that you install the software in a new Oracle home.

   See Selecting Directories for Installation and Configurationin *Planning an Installation of Oracle Fusion Middleware*.

10. On the Installation Type screen, select **Standalone HTTP Server (Managed independently of WebLogic server)** and click **Next**.

11. The Prerequisite Checks screen analyzes the host computer to ensure that the specific operating system prerequisites have been met.

    To view the list of tasks that are verified, select **View Successful Tasks**. To view log details, select **View Log**. If any prerequisite check fails, then an error message appears at the bottom of the screen. Fix the error and click **Rerun** to try again. To ignore the error or the warning message and continue with the installation, click **Skip** (not recommended).

12. On the Security Updates screen, indicate how you would like to receive security updates if you already have an Oracle Support account.

If you do not have an Oracle Support account and you are sure that you want to skip this step, clear the check box and verify your selection in the follow-up dialog box.

13. On the Installation Summary screen, verify the installation options that you selected.

    If you want to save these options to a response file, click **Save Response File** and enter the response file location and name. The response file collects and stores all the information that you have entered, and enables you to perform a silent installation (from the command line) at a later time.
    Click **Install** to begin the installation.

14. On the Installation Progress screen, when the progress bar displays 100%, click **Finish** to dismiss the installer, or click **Next** to see a summary.

15. The Installation Complete screen displays the Installation Location and the Feature Sets that are installed. Review this information and click **Finish** to close the installer.

You have installed the Oracle HTTP Server in a standalone mode.

Stopping Servers and Processes

Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.

An Oracle Fusion Middleware environment can consist of an Oracle WebLogic Server domain, an Administration Server, multiple managed servers, Java components, system components such as Identity Management components, and a database used as a repository for metadata. The components may be dependent on each other, so they must be stopped in the correct order.

> **Note:**
>
> The procedures in this section describe how to stop the existing, pre-upgrade servers and processes using the WLST command-line utility or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager.

To stop your pre-upgrade Fusion Middleware environment, navigate to the pre-upgrade domain and follow the steps below:

Step 1: Stop System Components

To stop system components, such as Oracle HTTP Server, use the `stopComponent` script:

- (UNIX) `*EXISTING_DOMAIN_HOME*/bin/stopComponent.sh *component_name*`
- (Windows) `*EXISTING_DOMAIN_HOME*\bin\stopComponent.cmd *component_name*`

You can stop system components in any order.

Step 2: Stop the Managed Servers

To stop a WebLogic Server Managed Server, use the `stopManagedWebLogic` script:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopManagedWebLogic.sh managed_server_name admin_url`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopManagedWebLogic.cmd managed_server_name admin_url`

When prompted, enter your user name and password.

Step 3: Stop Oracle Identity Management Components

Stop any Oracle Identity Management components, such as Oracle Internet Directory:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopComponent.sh component_name`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopComponent.cmd component_name`

Step 4: Stop the Administration Server

When you stop the Administration Server, you also stop the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To stop the Administration Server, use the `stopWebLogic` script:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopWebLogic.sh`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 5: Stop Node Manager

To stop Node Manager, close the command shell in which it is running.

Alternatively, after setting the `nodemanager.properties` attribute `QuitEnabled` to `true` (the default is `false`), you can use WLST to connect to Node Manager and shut it down. See stopNodeManager in *WLST Command Reference for WebLogic Server*.

About Reconfiguring the Domain

Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).

When you reconfigure a standalone domain, the following items are automatically updated, depending on the applications in the domain:

- WebLogic Server 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 version of the target Oracle HTTP Server.
- The reconfiguration template for Oracle HTTP Server is automatically selected and applied to the domain. This template defines any reconfiguration tasks that are required to make the standalone domain compatible with the target Oracle HTTP Server version.
- The start scripts are updated.

  If you want to preserve your modified start scripts, be sure to back them up before starting the Reconfiguration Wizard.

> **Note:**
>
> When the domain reconfiguration process starts, you can't undo the changes that it makes. Before running the Reconfiguration Wizard, ensure that you have backed up the domain as covered in the pre-upgrade checklist. 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 before reconfiguration.

Follow these instructions to reconfigure the existing domain using the Reconfiguration Wizard. See Reconfiguring WebLogic Domains in *Upgrading Oracle WebLogic Server*.

- Backing Up the Domain
- Starting the Reconfiguration Wizard
- Reconfiguring the Existing Domain with the Reconfiguration Wizard

Backing Up the Domain

Before running the Reconfiguration Wizard, create a backup copy of the domain directory.

To create a backup of the domain directory:

1. Copy the source domain to a separate location to preserve the contents.

   (Windows) `copy C:\domains\mydomain to C:\domains\mydomain_backup`.

   (UNIX) `cp mydomain /domains/mydomain_backup`
2. Before updating the domain on each remote Managed Server, create 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 before reconfiguration.

Starting the Reconfiguration Wizard

> **Note:**
>
> Shut down the administration server and all collocated managed servers before starting the reconfiguration process. See Stopping Servers and Processes .

To start the Reconfiguration Wizard in graphical mode:

1. Sign 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. Go to the `oracle_common/common/bin` directory:
   - (UNIX) *NEW_ORACLE_HOME*`/oracle_common/common/bin`
   - (Windows) *NEW_ORACLE_HOME*`\oracle_common\commom\bin`
4. Start the Reconfiguration Wizard with the following logging options:
   - (UNIX) `./reconfig.sh -log=`*log_file* `-log_priority=ALL`
   - (Windows) `reconfig.cmd -log=`*log_file* `-log_priority=ALL`

   where *log_file* is 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 this command, the following error message might appear 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
   > ```

Reconfiguring the Existing Domain with the Reconfiguration Wizard

Navigate through the screens in the Reconfiguration Wizard to reconfigure your existing domain.

To reconfigure the domain with the Reconfiguration Wizard:

1. On the Select Domain screen, specify the location of the domain you want to upgrade or click **Browse** to navigate and select the domain directory. Click **Next**.

2. On the Reconfiguration Setup Progress screen, view the progress of the setup process. When complete, click **Next**.

   During this process:

   - The reconfiguration templates for your installed products, including Fusion Middleware products, are automatically applied. This updates various domain configuration files such as `config.xml`, `config-groups.xml`, and `security.xml` (among others).
   - Scripts and other such files that support Oracle HTTP Server are updated.
   - The domain upgrade is validated.

3. On the Domain Mode and JDK screen, select the JDK to use in the domain or click **Browse** to navigate to the JDK you want to use. The supported JDK version for 12*c* (12.2.1.3.0) is 1.8.0_131 and later. Click **Next**.

   > **Note:**
   >
   > You cannot change the **Domain Mode** at this stage.

   For a list of JDKs that are supported for a specific platform, see Oracle Fusion Middleware Supported System Configurations.

4. The Node Manager screen is only displayed if the domain you are reconfiguring is currently using a per host Node Manager.

   On the Node Manager screen, 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**.

Table 5-2 Field Descriptions for Node Manager Screen

Option	Description
Per Domain Default Location	If you select this option, the Node Manager home is redefined to *`DOMAIN_NAME`*`/nodemanager` and you cannot edit the Node Manager home.
Per Domain Custom Location	Select this option if you want the per domain Node Manager configuration files to be created in a specific location for this domain. Specify the directory in the **Node Manager Home** field, or click **Browse** to use the navigation tree to select the location. The specified directory must be empty. The `nodemanager.properties` and `nodemanager.domains` files are created in this directory.
Node Manager Home	If you selected the **Per Domain Custom Location** option, click **Browse** to navigate to the directory location that you want to use to store the per domain Node Manager configuration.

Table 5-2   (Cont.) Field Descriptions for Node Manager Screen

Option	Description
Manual Node Manager Setup	If you select this option, creation of the Node Manager configuration for the domain is skipped and the remaining fields cannot be modified. If you want to use Node Manager in the domain, you must manually configure Node Manager as described in Completing the Node Manager Configuration. The reconfigured domain will still use a per host Node Manager configuration. You should also select this option if your existing domain is not configured to use Node Manager and you do not want to use Node Manager in the reconfigured domain. For more information about Node Manager configuration, see Administering Node Manager for Oracle WebLogic Server.
Node Manager Configuration	Select one of the following two options. These fields are not available if you selected **Manual Node Manager Setup**.
Create New Configuration	A per domain Node Manager configuration is automatically created for the reconfigured domain using default settings in `nodemanager.properties`. If necessary, you can modify `nodemanager.properties` after the domain has been successfully reconfigured.
Migrate Existing Configuration	The existing per host Node Manager configuration is migrated to a per domain configuration for the reconfigured domain. This does not include environment-specific settings for `ListenAddress`, `ListenPort`, `StartScriptName`, `JavaHome`, and `LogFile`.
Node Manager Home	If you selected the **Migrate Existing Configuration** option, enter or browse to the Node Manager home directory that you want to migrate to the reconfigured domain.

Table 5-2 (Cont.) Field Descriptions for Node Manager Screen

Option	Description

Apply Oracle Recommended Defaults	If you selected the **Migrate Existing Configuration** option, select this check box if you want to use Oracle-recommended defaults in the `nodemanager.properties` file. Deselect this check box if you want to continue using the settings in the `nodemanager.properties` file being migrated.
	Oracle-recommended properties with default values are as follows:
	`LogLimit=0`
	`AuthenticationEnabled=true`
	`LogLevel=INFO`
	`DomainsFileEnabled=true`
	`NativeVersionEnabled=true`
	`LogToStderr=true`
	`SecureListener=true`
	`LogCount=1`
	`StopScriptEnabled=false`
	`QuitEnabled=false`
	`LogAppend=true`
	`StateCheckInterval=500`
	`CrashRecoveryEnabled=false`
	`StartScriptEnabled=true`
	`LogFormatter=weblogic.nodemanager.server.LogFormatter`
	`ListenBacklog=50`

Node Manager Credentials: Username and Password	Specify the user name and password that you want to use to start Node Manager in the reconfigured domain.

5. On the Configuration Summary screen, review the detailed configuration settings of the domain before continuing.

   You can limit the items that are displayed in the right-most panel by selecting a filter option from the **View** drop-down list.

   To change the configuration, click **Back** to return to the appropriate screen. To reconfigure the domain, click **Reconfig**.

   > **Note:**
   >
   > The location of the domain does not change when you reconfigure it.

6. The Reconfiguration Progress screen displays the progress of the reconfiguration process.

   During this process:

   - Domain information is extracted, saved, and updated.
   - Scripts and other such files that support Oracle HTTP Server are updated.

   When the progress bar shows 100%, click **Next**.

7. The End of Configuration screen indicates whether the reconfiguration process completed successfully or failed. It also displays the location of the domain that was

reconfigured. If the reconfiguration is successful, it displays `Domain Configuration Succeeded`.

If the reconfiguration process did not complete successfully, an error message is displayed indicates the reason. Take appropriate action to resolve the issue. If you cannot resolve the issue, contact My Oracle Support.

Note the Domain Location for further operations.

Upgrading Standalone System Component Configurations

Use the Upgrade Assistant to upgrade the standalone agent's component configurations when the agent is managed by OPMN. The standalone component configuration upgrade does not support upgrade of a standalone agent that is not managed by OPMN.

- Starting the Upgrade Assistant
  Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).
- Upgrading Standalone System Component Configurations Using the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to upgrade standalone system component configurations.
- Verifying the Domain-Specific-Component Configurations Upgrade
  To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

Starting the Upgrade Assistant

Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

To start the Upgrade Assistant:

> **Note:**
>
> Before you start the Upgrade Assistant, make sure that the JVM character encoding is set to UTF-8 for the platform on which the Upgrade Assistant is running. If the character encoding is not set to UTF-8, then you will not be able to download files containing Unicode characters in their names. This can cause the upgrade to fail.

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant:
   - (UNIX) `./ua`

- (Windows) `ua.bat`

For information about other parameters that you can specify on the command line, such as logging parameters, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 5-3 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.

Table 5-3 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `–logLevel TRACE` is used.

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Upgrading Standalone System Component Configurations Using the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to upgrade standalone system component configurations.

To upgrade the existing 12*c* domain using the Upgrade Assistant:

1. On the Welcome screen, review an introduction to the Upgrade Assistant and information about important pre-upgrade tasks. Click **Next**.

   > **Note:**
   >
   > For more information about any Upgrade Assistant screen, click **Help** on the screen.

2. On the Standalone Components screen, select **Standalone System Component Configurations**.

   Select **Update an Existing Domain** and enter the location of the existing 12*c* domain in the **Domain Directory** field. You can also click **Browse** to select the existing domain directory by using the navigation tree. Click **Next**.

   > **Note:**
   >
   > - The **Create a New Domain** option should only be used if you are upgrading from version 11*g*.
   > - If you have already created a new 12*c* standalone domain for your upgraded 11*g* system components, you can extend the standalone domain with the standalone Oracle HTTP Server by using the **Update an Existing Domain** option.
   > - The **Update an Existing Domain** option should only be used if you are upgrading from a previous 12*c* release (12.1.2.0.0, 12.1.3.0.0, 12.2.1.0.0, 12.2.1.1.0, and 12.2.1.2.0) to the latest 12*c* release (12.2.1.3.0).

3. On the Component List screen, verify that the list includes all the components for which you want to upgrade configurations and click **Next**.

   If you do not see the components you want to upgrade, click **Back** to go to the previous screen and specify a different domain.

4. On the Prerequisites screen, acknowledge that the prerequisites have been met by selecting all the check boxes. Click **Next**.

   > **Note:**
   >
   > The Upgrade Assistant does not verify whether the prerequisites have been met.

5. On the Instance Directories screen, select **12*c* Source** and click **Next**.

   You do not need to enter the Oracle instance directories when upgrading to the latest 12*c* release from a previous 12*c* release.

6. On the Examine screen, review the status of the Upgrade Assistant as it examines each standalone component, verifying that the standalone component configuration is ready for upgrade. If the status is **Examine finished**, click **Next**.

   If the examine phase fails, Oracle recommends that you cancel the upgrade by clicking **No** in the Examination Failure dialog. Click **View Log** to see what caused the error and refer to Troubleshooting Your Upgrade in *Upgrading with the Upgrade Assistant*for information on resolving common upgrade errors.

> **Note:**
>
> - If you resolve any issues detected during the examine phase without proceeding with the upgrade, you can start the Upgrade Assistant again without restoring from backup. However, if you proceed by clicking **Yes** in the Examination Failure dialog box, you need to restore your pre-upgrade environment from backup before starting the Upgrade Assistant again.
> - Canceling the examination process has no effect on the configuration data; the only consequence is that the information the Upgrade Assistant has collected must be collected again in a future upgrade session.

7. On the Upgrade Summary screen, review the summary of the options you have selected for component configuration upgrade.

   The response file collects and stores all the information that you have entered, and enables you to perform a silent upgrade at a later time. The silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again. If you want to save these options to a response file, click **Save Response File** and provide the location and name of the response file.
   Click **Upgrade** to start the upgrade process.

8. On the Upgrade Progress screen, monitor the status of the upgrade.

   > **Caution:**
   >
   > Allow the Upgrade Assistant enough time to perform the upgrade. Do not cancel the upgrade operation unless absolutely necessary. Doing so may result in an unstable environment.

   If any components are not upgraded successfully, refer to the Upgrade Assistant log files for more information.

   > **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.

   Click **Next**.

9. If the upgrade is successful: On the Upgrade Success screen, click **Close** to complete the upgrade and close the wizard. The Post-Upgrade Actions window describes the manual tasks you must perform to make components functional in

the new installation. This window appears only if a component has post-upgrade steps.

If the upgrade fails: On the Upgrade Failure screen, click **View Log** to view and troubleshoot the errors. The logs are available at `ORACLE_HOME/oracle_common/upgrade/logs`. Note If the upgrade fails you must restore your pre-upgrade environment from backup, fix the issues, then restart the Upgrade Assistant.

Verifying the Domain-Specific-Component Configurations Upgrade

To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

To sign in to the Administration Console, go to: `http://administration_server_host:administration_server_port/console`

To sign in to Oracle Enterprise Manager Fusion Middleware Control Console, go to: `http://administration_server_host:administration_server_port/em`

> **Note:**
>
> After upgrade, make sure you run the administration tools from the new 12*c* (12.2.1.3.0) Oracle home directory and not from the previous Oracle home directory.
>
> During the upgrade process, some OWSM documents, including policy sets and predefined documents such as policies and assertion templates, may need to be upgraded. If a policy set or a predefined document is upgraded, its version number is incremented by 1.
>
> If you created the FMW user to run the Upgrade Assistant, ensure that you delete the account after verifying your upgrade was successful.

Verifying the Upgrade

You can verify that the upgrade is successful if you are able to start the Node Manager and the Standalone Oracle HTTP Server properly.

If you experience post-upgrade issues, you need to troubleshoot the installation and retry the upgrade. See Troubleshooting Oracle HTTP Server in *Administrator's Guide for Oracle HTTP Server*.

If you are not able to start the newly upgraded environment, a possible cause could be the use of MD5 certificates in your Oracle wallet. To check whether you are using MD5 signatures and how to replace them with SHA-2 certificates, see Replacing Certificate Signed Using MD5 Algorithm with Certificate Signed Using SHA-2 Algorithm .

- Starting the Node Manager
  Server instances in a WebLogic Server production environment are often distributed across multiple domains, machines, and geographic locations. Node Manager is a WebLogic Server utility that enables you to manage (start, shut down, and restart) your Oracle HTTP Server instance.

- Starting the Standalone Oracle HTTP Server
  After the upgrade, start the standalone Oracle HTTP Server.

Starting the Node Manager

Server instances in a WebLogic Server production environment are often distributed across multiple domains, machines, and geographic locations. Node Manager is a WebLogic Server utility that enables you to manage (start, shut down, and restart) your Oracle HTTP Server instance.

On Windows operating systems, Oracle recommends that you configure Node Manager to run as a startup service. This allows Node Manager to start up automatically each time the system is restarted. For more information, see Running Node Manager as a Startup Service in *Administering Node Manager for Oracle WebLogic Server*.

> **Note:**
>
> On UNIX platforms, do not run Node Manager as the root user.

Starting the Standalone Oracle HTTP Server

After the upgrade, start the standalone Oracle HTTP Server.

To start the standalone Oracle HTTP Server:

1. Go to the DOMAIN_HOME/bin directory:

   (UNIX) ORACLE_HOME/user_projects/domains/<*domain name*>/bin

   (WINDOWS) ORACLE_HOME\user_projects\domains\<*domain name*>\bin
2. Enter the command to start the standalone server.

   On UNIX operating systems:

   ```
   ./startComponent.sh ohs_name
   ```

   On Windows operating systems:

   ```
   startComponent.cmd ohs_name
   ```

   See Starting and Stopping System Components in *Administering Oracle Fusion Middleware*.

Starting Servers and Processes

After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.

The components may be dependent on each other so they must be started in the correct order.

> **Note:**
>
> The procedures in this section describe how to start servers and process using the WLST command line or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager in *Administering Oracle Fusion Middleware.*

To start your Fusion Middleware environment, follow the steps below:

Step 1: Start the Administration Server

When you start the Administration Server, you also start the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To start the Administration Server, use the `startWebLogic` script:

- (UNIX) *`NEW_DOMAIN_HOME`*`/bin/startWebLogic.sh`
- (Windows) *`NEW_DOMAIN_HOME`*`\bin\startWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 2: Start Node Manager

To start Node Manager, use the `startNodeManager` script:

- (UNIX) *`NEW_DOMAIN_HOME`*`/bin/startNodeManager.sh`
- (Windows) *`NEW_DOMAIN_HOME`*`\bin\startNodeManager.cmd`

Step 3: Start Oracle Identity Management Components

Start any Oracle Identity Management components, such as Oracle Internet Directory, that form part of your environment:

- (UNIX) *`NEW_DOMAIN_HOME`*`/bin/startComponent.sh` *`component_name`*
- (Windows) *`NEW_DOMAIN_HOME`*`\bin\startComponent.cmd` *`component_name`*

Step 4: Start the Managed Servers

To start a WebLogic Server Managed Server, use the `startManagedWebLogic` script:

- (UNIX) *`NEW_DOMAIN_HOME`*`/bin/startManagedWebLogic.sh` *`managed_server_name admin_url`*
- (Windows) *`NEW_DOMAIN_HOME`*`\bin\startManagedWebLogic.cmd` *`managed_server_name admin_url`*

When prompted, enter your user name and password.

> **Note:**
>
> The startup of a Managed Server will typically start the applications that are deployed to it. Therefore, it should not be necessary to manually start applications after the Managed Server startup.

Step 5: Start System Components

To start system components, such as Oracle HTTP Server, use the `startComponent` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startComponent.sh component_name`
- (Windows) `NEW_DOMAIN_HOME\bin\startComponent.cmd component_name`

You can start system components in any order.

6

Upgrading a Managed Oracle HTTP Server from a Previous 12*c* Release

This chapter describes the procedure to upgrade a managed Oracle HTTP Server to a latest 12*c* release from a previous 12*c* release. The valid starting point for this upgrade are 12*c* releases 12.1.2 and above.

This procedure assumes that you have an existing 12c Fusion Middleware Infrastructure installed and configured (WebLogic Domain either in Full-JRF or Restricted JRF mode) on your system.

> **Note:**
>
> You can install and configure a managed/collocated Oracle HTTP Server in either Full-JRF or Restricted-JRF domain. The key difference between the two is that there is no database dependency in the case of the Restricted-JRF mode. See About Full-JRF and Restricted-JRF Modes.
>
> You have to upgrade the database schemas only for the Full-JRF mode, if required.

- About the Managed Oracle HTTP Server Upgrade Process from a Previous 12c Release
  Review the flowchart and roadmap for an overview of the upgrade process for Managed Oracle HTTP Server.
- Installing the Product Distributions
  Before you begin your upgrade, download Oracle Fusion Middleware Infrastructure and Oracle HTTP Server 12*c* (12.2.1.3.0) distributions on the target system and install them using Oracle Universal Installer.
- Running a Pre-Upgrade Readiness Check
  To identify potential issues with the upgrade, Oracle recommends that you run a readiness check before you start the upgrade process. Be aware that the readiness check may not be able to discover all potential issues with your upgrade. An upgrade may still fail, even if the readiness check reports success.
- Stopping Servers and Processes
  Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.
- Upgrading Product Schemas (Applicable for Full-JRF Only)
  After stopping servers and processes, use the Upgrade Assistant to upgrade supported product schemas to the current release of Oracle Fusion Middleware.
- About Reconfiguring the Domain
  Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).

- Upgrading Domain Component Configurations
  After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.
- Starting Servers and Processes
  After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.
- Verifying the Upgrade
  If you can log in to the Administration Console, the Enterprise Manager Fusion Middleware Control, and the OHS Home Page, then your upgrade is successful.

About the Managed Oracle HTTP Server Upgrade Process from a Previous 12*c* Release

Review the flowchart and roadmap for an overview of the upgrade process for Managed Oracle HTTP Server.

Figure 6-1 shows the process flow to upgrade a Managed Oracle HTTP Server to the latest 12*c* release. The tools used for each step are also listed.

Figure 6-1 Process Flowchart for the Upgrade of Managed Oracle HTTP Server from a Previous 12*c* Release

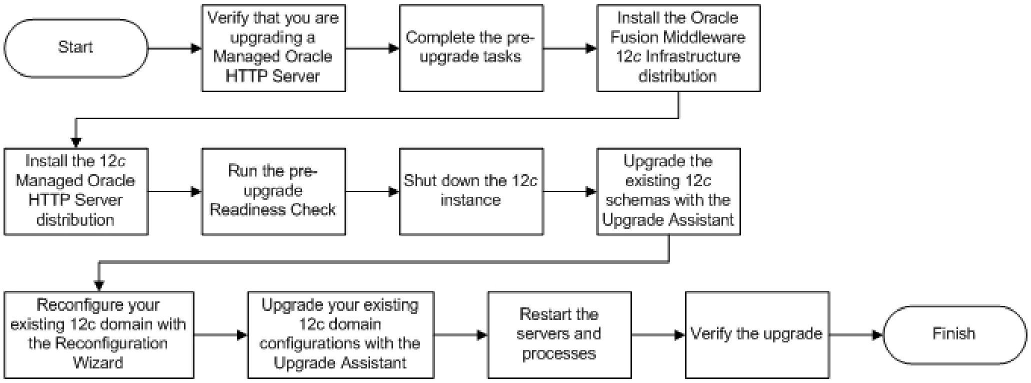

Start
Verify that you are upgrading a Managed Oracle HTTP Server
Complete the pre-upgrade tasks
Install the Oracle Fusion Middleware 12c Infrastructure distribution
Install the 12c Managed Oracle HTTP Server distribution
Run the pre-upgrade Readiness Check
Shut down the 12c instance
Upgrade the existing 12c schemas with the Upgrade Assistant
Reconfigure your existing 12c domain with the Reconfiguration Wizard
Upgrade your existing 12c domain configurations with the Upgrade Assistant
Restart the servers and processes
Verify the upgrade
Finish

Table 6-1 describes the tasks that must be completed to upgrade a Managed Oracle HTTP Server from a previous 12*c* release to 12*c* (12.2.1.3.0).

Table 6-1 Tasks for Upgrading Managed Oracle HTTP Server from a Previous 12*c* Release

Task	Description
Required Verify that you are upgrading a Managed Oracle HTTP Server.	To determine which Oracle HTTP Server you have in your existing environment, see Determining whether Oracle HTTP Server is Standalone or Managed (Collocated).

Table 6-1 (Cont.) Tasks for Upgrading Managed Oracle HTTP Server from a Previous 12*c* Release

Task	Description
Required If you have not done so already, review the introductory topics in this guide and complete the required pre-upgrade tasks.	The pre-upgrade tasks include cloning your production environment, verifying system requirements and certifications, purging unused data, and creating non-SYSDBA user. For a complete list of pre-upgrade tasks, see Preparing to Upgrade Oracle HTTP Server.
Required Download and install the 12.2.1.3.0 Fusion Middleware Infrastructure and Oracle HTTP Server distributions.	The Infrastructure distribution packs the WebLogic Server and the Java Required Files (JRF) that are required to set up the foundation to install other Fusion Middleware products. As per the upgrade topology defined in this guide, you must install the Infrastructure in a new Oracle home. You must install Oracle HTTP Server in the Oracle home that is created when you installed the 12.2.1.3.0 Infrastructure. See Installing the Product Distributions.
Optional Run the Readiness Check.	Running the Readiness Check helps using the Upgrade Assistant helps you to determine whether your pre-upgrade environment is ready for upgrade. For the complete procedure, see Running a Pre-Upgrade Readiness Check.
Required Shut down the 12*c* instance.	Before starting the upgrade process, shut down the Administration Server, the Managed Servers, and your 12*c* instance. See Stopping Servers and Processes .
Required Upgrade the existing schemas with the Upgrade Assistant.	See Upgrading Product Schemas (Applicable for Full-JRF Only).
Required Reconfigure your existing domain.	Run the Reconfiguration Wizard from 12*c* Oracle HTTP Server installation to reconfigure the existing domain. See Reconfiguring the Existing Domain with the Reconfiguration Wizard.
Required Upgrade your existing domain configurations.	After the installation, you need to use the Upgrade Assistant to upgrade the Oracle HTTP Server and system component infrastructure. See Upgrading Domain Components Using the Upgrade Assistant.
Required Restart the servers and processes.	The upgrade process is complete. You can now restart the Administration Server, the Managed Servers, and your 12.2.1.3.0 instance. See Starting Servers and Processes.
Required Verify the upgrade.	For verifying the upgrade, see Verifying the Upgrade.

Installing the Product Distributions

Before you begin your upgrade, download Oracle Fusion Middleware Infrastructure and Oracle HTTP Server 12*c* (12.2.1.3.0) distributions on the target system and install them using Oracle Universal Installer.

> **Note:**
>
> When Infrastructure is required for the upgrade, you must install the Oracle Fusion Middleware distribution first before you install other Fusion Middleware products.

To install the 12*c* (12.2.1.3.0) distributions:

1. Sign in to the target system.
2. Download the following from Oracle Technology Network or Oracle Software Delivery Cloud to your target system:
   - Oracle Fusion Middleware Infrastructure (`fmw_12.2.1.3.0_infrastructure_generic.jar`)
   - Oracle HTTP Server (UNIX: `fmw_12.2.1.2.0_ohs_linux64.bin`), (Windows: `setup_fmw_12.2.1.2.0_ohs_win64.exe`)
3. Check that your machines meet the following requirements:
   - Ensure that the system, patch, kernel, and other requirements are met as specified in *Installing and Configuring Oracle HTTP Server*.
   - Because Oracle HTTP Server is installed by default on port 7777, you must ensure that port 7777 is not used by any service on the nodes. To check if this port is in use, run the following command before you install Oracle HTTP Server. You must free the port if it is in use.

     ```
     netstat -an | grep 7777
     ```
4. On UNIX platforms, if the `/etc/oraInst.loc` file exists, check that its contents are correct. Specifically, check that the inventory directory is correct and that you have write permissions for that directory.

   If the `/etc/oraInst.loc` file does not exist, you can skip this step.
5. Change to the directory where you downloaded the 12*c* (12.2.1.3.0) product distribution.
6. Start the installation program for Oracle Fusion Middleware Infrastructure:
   - (UNIX) `JDK_HOME/bin/java -jar fmw_12.2.1.3.0_infrastructure_generic.jar`
   - (Windows) `JDK_HOME\bin\java -jar fmw_12.2.1.3.0_infrastructure_generic.jar`
7. On UNIX operating systems, the Installation Inventory Setup screen appears if this is the first time you are installing an Oracle product on this host.

Specify the location where you want to create your central inventory. Make sure that the operating system group name selected on this screen has write permissions to the central inventory location, and click **Next**.

> **Note:**
>
> The Installation Inventory Setup screen does not appear on Windows operating systems.

8. On the Welcome screen, review the information to make sure that you have met all the prerequisites. Click **Next**.
9. On the Auto Updates screen, select an option:

   - **Skip Auto Updates**: If you do not want your system to check for software updates at this time.
   - **Select patches from directory**: To navigate to a local directory if you downloaded patch files.
   - **Search My Oracle Support for Updates**: To automatically download software updates if you have a My Oracle Support account. You must enter Oracle Support credentials then click **Search**. To configure a proxy server for the installer to access My Oracle Support, click **Proxy Settings**. Click **Test Connection** to test the connection.

   Click **Next**.
10. On the Installation Location screen, specify the location for the Oracle home directory and click **Next**.

    Since you are installing the standard installation topology for a collocated Oracle HTTP Server in a WebLogic Server domain, enter the path to an existing Oracle Fusion Middleware Infrastructure Oracle home.

    See Selecting Directories for Installation and Configuration in *Planning an Installation of Oracle Fusion Middleware*.
11. On the Installation Type screen, select the following:

    - For Infrastructure, select **Fusion Middleware Infrastructure**
    - For Oracle HTTP Server, select **Collocated HTTP Server (Managed through WebLogic Server)**

    Click **Next**.
12. The Prerequisite Checks screen analyzes the host computer to ensure that the specific operating system prerequisites have been met.

    To view the list of tasks that are verified, select **View Successful Tasks**. To view log details, select **View Log**. If any prerequisite check fails, then an error message appears at the bottom of the screen. Fix the error and click **Rerun** to try again. To ignore the error or the warning message and continue with the installation, click **Skip** (not recommended).
13. On the Installation Summary screen, verify the installation options that you selected.

    If you want to save these options to a response file, click **Save Response File** and enter the response file location and name. The response file collects and stores all the information that you have entered, and enables you to perform a silent installation (from the command line) at a later time.
    Click **Install** to begin the installation.

14. On the Installation Progress screen, when the progress bar displays 100%, click **Finish** to dismiss the installer, or click **Next** to see a summary.
15. The Installation Complete screen displays the Installation Location and the Feature Sets that are installed. Review this information and click **Finish** to close the installer.
16. After you have installed Oracle Fusion Middleware Infrastructure, enter the following command to start the installer for your product distribution and repeat the steps above to navigate through the installer screens:

    (UNIX) `./fmw_12.2.1.2.0_ohs_linux64.bin`

    (Windows) `setup_fmw_12.2.1.2.0_ohs_win64.exe`

You have installed the Oracle HTTP Server in a collocated mode.

Running a Pre-Upgrade Readiness Check

To identify potential issues with the upgrade, Oracle recommends that you run a readiness check before you start the upgrade process. Be aware that the readiness check may not be able to discover all potential issues with your upgrade. An upgrade may still fail, even if the readiness check reports success.

- About Running a Pre-Upgrade Readiness Check
  You can run the Upgrade Assistant in `-readiness` mode to detect issues before you perform the actual upgrade. You can run the readiness check in GUI mode using the Upgrade Assistant or in silent mode using a response file.
- Starting the Upgrade Assistant in Readiness Mode
  Use the `-readiness` parameter to start the Upgrade Assistant in readiness mode.
- Performing a Readiness Check with the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to complete the pre-upgrade readiness check.
- Understanding the Readiness Report
  After performing a readiness check for your domain, review the report to determine whether you need to take any action for a successful upgrade.

About Running a Pre-Upgrade Readiness Check

You can run the Upgrade Assistant in `-readiness` mode to detect issues before you perform the actual upgrade. You can run the readiness check in GUI mode using the Upgrade Assistant or in silent mode using a response file.

The Upgrade Assistant readiness check performs a read-only, pre-upgrade review of your Fusion Middleware schemas and WebLogic domain configurations that are at a supported starting point. The review is a read-only operation.

The readiness check generates a formatted, time-stamped readiness report so you can address potential issues before you attempt the actual upgrade. If no issues are detected, you can begin the upgrade process. Oracle recommends that you read this report thoroughly before performing an upgrade.

You can run the readiness check while your existing Oracle Fusion Middleware domain is online (while other users are actively using it) or offline.

You can run the readiness check any number of times before performing any actual upgrade. However, do not run the readiness check after an upgrade has been performed, as the report results may differ from the result of pre-upgrade readiness checks.

> **Note:**
>
> To prevent performance from being affected, Oracle recommends that you run the readiness check during off-peak hours.

Starting the Upgrade Assistant in Readiness Mode

Use the `-readiness` parameter to start the Upgrade Assistant in readiness mode.

To perform a readiness check on your pre-upgrade environment with the Upgrade Assistant:

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant.
   - (UNIX) `./ua -readiness`
   - (Windows) `ua.bat -readiness`

   > **Note:**
   >
   > If the `DISPLAY` environment variable is not set up properly to allow for GUI mode, you may encounter the following error:
   >
   > ```
   > Xlib: connection to ":1.0" refused by server
   > Xlib: No protocol specified
   > ```
   >
   > To resolve this issue, set the `DISPLAY` environment variable to the system name or IP address of your local workstation, and rerun Upgrade Assistant.
   >
   > If you continue to receive these errors after setting `DISPLAY`, try launching another GUI tool, such as `vncconfig`. If you see the same errors, your `DISPLAY` environment variable may still not be set correctly.

   For information about other parameters that you can specify on the command line, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 6-2 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `-logLevel TRACE` is used.

Table 6-2 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Performing a Readiness Check with the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to complete the pre-upgrade readiness check.

Readiness checks are performed only on schemas or component configurations that are at a supported upgrade starting point.

To complete the readiness check:

1. On the Welcome screen, review information about the readiness check. Click **Next**.
2. On the Readiness Check Type screen, select the readiness check that you want to perform:
   - **Individually Selected Schemas** allows you to select individual schemas for review before upgrade. The readiness check reports whether a schema is supported for an upgrade or where an upgrade is needed.
     When you select this option, the screen name changes to Selected Schemas.
   - **Domain Based** allows the Upgrade Assistant to discover and select all upgrade-eligible schemas or component configurations in the domain specified in the **Domain Directory** field.
     When you select this option, the screen name changes to Schemas and Configuration.

     Leave the default selection if you want the Upgrade Assistant to check all schemas and component configurations at the same time, or select a specific option:

   - **Include checks for all schemas** to discover and review all components that have a schema available to upgrade.
   - **Include checks for all configurations** to review component configurations for a managed WebLogic Server domain.

   Click **Next**.

3. If you selected **Individually Selected Schemas**: On the Available Components screen, select the components that have a schema available to upgrade for which you want to perform a readiness check.

   If you selected **Domain Based**: On the Component List screen, review the list of components that are present in your domain for which you want to perform a readiness check.

   If you select a component that has dependent components, those components are automatically selected. For example, if you select Oracle Platform Security Services, Oracle Audit Services is automatically selected.

   Depending on the components you select, additional screens may display. For example, you may need to:

   - Specify the domain directory.
   - Specify schema credentials to connect to the selected schema: **Database Type**, **DBA User Name**, and **DBA Password**. Then click **Connect**.

     > **Note:**
     >
     > Oracle database is the default database type. Make sure that you select the correct database type before you continue. If you discover that you selected the wrong database type, do not go back to this screen to change it to the correct type. Instead, close the Upgrade Assistant and restart the readiness check with the correct database type selected to ensure that the correct database type is applied to all schemas.

   - Select the **Schema User Name** option and specify the **Schema Password**.

   Click **Next** to start the readiness check.

4. On the Readiness Summary screen, review the summary of the readiness checks that will be performed based on your selections.

   If you want to save your selections to a response file to run the Upgrade Assistant again later in response (or silent) mode, click **Save Response File** and provide the location and name of the response file. A silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again.

   For a detailed report, click **View Log**.

   Click **Next**.

5. On the Readiness Check screen, review the status of the readiness check. The process can take several minutes.

   If you are checking multiple components, the progress of each component displays in its own progress bar in parallel.

   When the readiness check is complete, click **Continue**.

6. On the End of Readiness screen, review the results of the readiness check (**Readiness Success** or **Readiness Failure**):
   - If the readiness check is successful, click **View Readiness Report** to review the complete report. Oracle recommends that you review the Readiness Report before you perform the actual upgrade even when the readiness check is successful. Use the **Find** option to search for a particular word or phrase within the report. The report also indicates where the completed Readiness Check Report file is located.
   - If the readiness check encounters an issue or error, click **View Log** to review the log file, identify and correct the issues, and then restart the readiness check. The log file is managed by the command-line options you set.

Understanding the Readiness Report

After performing a readiness check for your domain, review the report to determine whether you need to take any action for a successful upgrade.

The format of the readiness report file is:

```
readiness<timestamp>.txt
```

Where, *timestamp* indicates the date and time of when the readiness check was run.

A readiness report contains the following information:

Table 6-3 Readiness Report Elements

Report Information	Description	Required Action
Overall Readiness Status: SUCCESS or FAILURE	The top of the report indicates whether the readiness check passed or completed with one or more errors.	If the report completed with one or more errors, search for FAIL and correct the failing issues before attempting to upgrade. You can re-run the readiness check as many times as necessary before an upgrade.
Timestamp	The date and time that the report was generated.	No action required.
Log file location `ORACLE_HOME/oracle_common/upgrade/logs`	The directory location of the generated log file.	No action required.
Readiness report location `ORACLE_HOME/oracle_common/upgrade/logs`	The directory location of the generated readiness report.	No action required.
Names of components that were checked	The names and versions of the components included in the check and status.	If your domain includes components that cannot be upgraded to this release, such as SOA Core Extension, do not attempt an upgrade.

Table 6-3 (Cont.) Readiness Report Elements

Report Information	Description	Required Action
Names of schemas that were checked	The names and current versions of the schemas included in the check and status.	Review the version numbers of your schemas. If your domain includes schemas that cannot be upgraded to this release, do not attempt an upgrade.
Individual Object Test Status: FAIL	The readiness check test detected an issue with a specific object.	Do not upgrade until all failed issues have been resolved.
Individual Object Test Status: PASS	The readiness check test detected no issues for the specific object.	If your readiness check report shows only the PASS status, you can upgrade your environment. Note, however, that the Readiness Check cannot detect issues with externals such as hardware or connectivity during an upgrade. You should always monitor the progress of your upgrade.
Completed Readiness Check of <Object> Status: FAILURE	The readiness check detected one or more errors that must be resolved for a particular object such as a schema, an index, or datatype.	Do not upgrade until all failed issues have been resolved.
Completed Readiness Check of <Object> Status: SUCCESS	The readiness check test detected no issues.	No action required.

Here is a sample Readiness Report file. Your report may not include all of these checks.

```
Upgrade readiness check completed with one or more errors.

This readiness check report was created on Tue March 30 11:15:52 EDT 
2019
Log file is located at: ORACLE_HOME/oracle_common/upgrade/logs/
ua2016-05-30-11-14-06AM.log
Readiness Check Report File: ORACLE_HOME/oracle_common/upgrade/logs/
readiness2016-05-30-11-15-52AM.txt

Starting readiness check of components.

Oracle Metadata Services
   Starting readiness check of Oracle Metadata Services.
     Schema User Name: DEV11_MDS
     Database Type: Oracle Database
     Database Connect String: machinename@yourcompany.com
     VERSION Schema DEV11_MDS is currently at version 12.2.1.4.0. 
Readiness checks will now be performed.
   Starting schema test:  TEST_REQUIRED_TABLES  Test that the schema 
contains all the required tables
   Completed schema test: TEST_REQUIRED_TABLES --> Test that the 
schema contains all the required tables +++ PASS
   Starting schema test:  TEST_REQUIRED_PROCEDURES  Test that the 
schema contains all the required stored procedures
```

```
     EXCEPTION     Schema is missing a required procedure:
GETREPOSITORYFEATURES
   Completed schema test: TEST_REQUIRED_PROCEDURES --> Test that the schema
contains all the required stored procedures +++ FAIL
   Starting schema test:  TEST_REQUIRED_VIEWS  Test that the schema contains
all the required database views
   Completed schema test: TEST_REQUIRED_VIEWS --> Test that the schema
contains all the required database views +++ PASS
   Starting index test for table MDS_ATTRIBUTES:  TEST_REQUIRED_INDEXES -->
Test that the table contains all the required indexes
   Completed index test for table MDS_ATTRIBUTES: TEST_REQUIRED_INDEXES -->
Test that the table contains all the required indexes +++ PASS
   Starting index test for table MDS_COMPONENTS:  TEST_REQUIRED_INDEXES -->
Test that the table contains all the required indexes
   Completed index test for table MDS_TXN_LOCKS: TEST_REQUIRED_INDEXES -->
Test that the table contains all the required indexes +++ PASS
   Starting schema test:  TEST_REQUIRED_TRIGGERS  Test that the schema has
all the required triggers
   Completed schema test: TEST_REQUIRED_TRIGGERS --> Test that the schema
has all the required triggers +++ PASS
   Starting schema test:  TEST_MISSING_COLUMNS  Test that tables and views
are not missing any required columns
   Completed schema test: TEST_MISSING_COLUMNS --> Test that tables and
views are not missing any required columns +++ PASS
   Starting schema test:  TEST_UNEXPECTED_TABLES  Test that the schema does
not contain any unexpected tables
   Completed schema test: TEST_UNEXPECTED_TABLES --> Test that the schema
does not contain any unexpected tables +++ PASS
   Starting schema test:  TEST_UNEXPECTED_PROCEDURES  Test that the schema
does not contain any unexpected stored procedures
   Completed schema test: TEST_UNEXPECTED_PROCEDURES --> Test that the
schema does not contain any unexpected stored procedures +++ PASS
   Starting schema test:  TEST_UNEXPECTED_VIEWS  Test that the schema does
not contain any unexpected views
   Completed schema test: TEST_UNEXPECTED_VIEWS --> Test that the schema
does not contain any unexpected views +++ PASS
   Starting index test for table MDS_ATTRIBUTES:  TEST_UNEXPECTED_INDEXES --
> Test that the table does not contain any unexpected indexes
   Completed index test for table MDS_ATTRIBUTES: TEST_UNEXPECTED_INDEXES --
> Test that the table does not contain any unexpected indexes +++ PASS
   Completed index test for table MDS_LABELS: TEST_UNEXPECTED_INDEXES -->
Test that the table does not contain any unexpected indexes +++ PASS
   Starting index test for table MDS_LARGE_ATTRIBUTES:
TEST_UNEXPECTED_INDEXES --> Test that the table does not contain any
unexpected indexes
   Starting schema test:  TEST_UNEXPECTED_TRIGGERS  Test that the schema
does not contain any unexpected triggers
   Completed schema test: TEST_UNEXPECTED_TRIGGERS --> Test that the schema
does not contain any unexpected triggers +++ PASS
   Starting schema test:  TEST_UNEXPECTED_COLUMNS  Test that tables and
views do not contain any unexpected columns
   Completed schema test: TEST_UNEXPECTED_COLUMNS --> Test that tables and
views do not contain any unexpected columns +++ PASS
   Starting datatype test for table MDS_ATTRIBUTES:
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the proper
```

```
datatypes
   Completed datatype test for table MDS_ATTRIBUTES:
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the
proper datatypes +++ PASS
   Starting datatype test for table MDS_COMPONENTS:
TEST_COLUMN_DATATYPES_V2 --> Test that all table columns have the
proper datatypes
   Starting permissions test:  TEST_DBA_TABLE_GRANTS  Test that DBA
user has privilege to view all user tables
   Completed permissions test: TEST_DBA_TABLE_GRANTS --> Test that DBA
user has privilege to view all user tables +++ PASS
   Starting schema test:  TEST_ENOUGH_TABLESPACE  Test that the schema
tablespaces automatically extend if full
   Completed schema test: TEST_ENOUGH_TABLESPACE --> Test that the
schema tablespaces automatically extend if full +++ PASS
   Starting schema test:  TEST_USER_TABLESPACE_QUOTA  Test that
tablespace quota for this user is sufficient to perform the upgrade
   Completed schema test: TEST_USER_TABLESPACE_QUOTA --> Test that
tablespace quota for this user is sufficient to perform the upgrade ++
+ PASS
   Starting schema test:  TEST_ONLINE_TABLESPACE  Test that schema
tablespaces are online
   Completed schema test: TEST_ONLINE_TABLESPACE --> Test that schema
tablespaces are online +++ PASS
   Starting schema test:  TEST_DATABASE_VERSION  Test that the
database server version number is supported for upgrade
     INFO   Database product version: Oracle Database 12c Enterprise
Edition Release 12.2.1.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing
options
   Completed schema test: TEST_DATABASE_VERSION --> Test that the
database server version number is supported for upgrade +++ PASS
   Finished readiness check of Oracle Metadata Services with status:
FAILURE.
```

If you are running the 12.1.3.0 version of Oracle Fusion Middleware IAU Schemas, and those schemas were upgraded from 11*g* (11.1.1.7 and later) or 12*c* (12.1.2.0), your readiness check may fail with the following error:

```
Starting index test for table IAU_COMMON:  TEST_REQUIRED_INDEXES --> Test
that the table contains all the required indexes
     INFO Audit schema index DYN_EVENT_CATEGORY_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_EVENT_TYPE_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_TENANT_INDEX in table IAU_COMMON is missing
the required columns or index itself is missing. This maybe caused by a known
issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_USER_INDEX in table IAU_COMMON is missing
the required columns or index itself is missing. This maybe caused by a known
issue, anyway, this missing index will be added in 12.2.2 upgrade.
     INFO Audit schema index DYN_COMPONENT_TYPE_INDEX in table IAU_COMMON is
missing the required columns or index itself is missing. This maybe caused by
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
```

```
     INFO Audit schema index DYN_USER_TENANT_INDEX in table IAU_COMMON is 
missing the required columns or index itself is missing. This maybe caused by 
a known issue, anyway, this missing index will be added in 12.2.2 upgrade.
   Completed index test for table IAU_COMMON: TEST_REQUIRED_INDEXES --> Test 
that the table contains all the required indexes +++ FAIL
```

> **Note:**
>
> You can ignore the missing index error in the readiness report. This is a known issue. The corresponding missing index is added during the schema upgrade operation. This error does not occur if the schema to be upgraded was created in 12*c* (12.2.1.3.0) by using the RCU.

Stopping Servers and Processes

Before you run the Upgrade Assistant to upgrade your schemas and configurations, you must shut down all of the pre-upgrade processes and servers, including the Administration Server and any managed servers.

An Oracle Fusion Middleware environment can consist of an Oracle WebLogic Server domain, an Administration Server, multiple managed servers, Java components, system components such as Identity Management components, and a database used as a repository for metadata. The components may be dependent on each other, so they must be stopped in the correct order.

> **Note:**
>
> The procedures in this section describe how to stop the existing, pre-upgrade servers and processes using the WLST command-line utility or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager.

To stop your pre-upgrade Fusion Middleware environment, navigate to the pre-upgrade domain and follow the steps below:

Step 1: Stop System Components

To stop system components, such as Oracle HTTP Server, use the `stopComponent` script:

- (UNIX) `*EXISTING_DOMAIN_HOME*/bin/stopComponent.sh *component_name*`
- (Windows) `*EXISTING_DOMAIN_HOME*\bin\stopComponent.cmd *component_name*`

You can stop system components in any order.

Step 2: Stop the Managed Servers

To stop a WebLogic Server Managed Server, use the `stopManagedWebLogic` script:

- (UNIX) `*EXISTING_DOMAIN_HOME*/bin/stopManagedWebLogic.sh *managed_server_name* *admin_url*`

- (Windows) `EXISTING_DOMAIN_HOME\bin\stopManagedWebLogic.cmd managed_server_name admin_url`

When prompted, enter your user name and password.

Step 3: Stop Oracle Identity Management Components

Stop any Oracle Identity Management components, such as Oracle Internet Directory:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopComponent.sh component_name`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopComponent.cmd component_name`

Step 4: Stop the Administration Server

When you stop the Administration Server, you also stop the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To stop the Administration Server, use the `stopWebLogic` script:

- (UNIX) `EXISTING_DOMAIN_HOME/bin/stopWebLogic.sh`
- (Windows) `EXISTING_DOMAIN_HOME\bin\stopWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 5: Stop Node Manager

To stop Node Manager, close the command shell in which it is running.

Alternatively, after setting the `nodemanager.properties` attribute `QuitEnabled` to `true` (the default is `false`), you can use WLST to connect to Node Manager and shut it down. See stopNodeManager in *WLST Command Reference for WebLogic Server*.

Upgrading Product Schemas (Applicable for Full-JRF Only)

After stopping servers and processes, use the Upgrade Assistant to upgrade supported product schemas to the current release of Oracle Fusion Middleware.

The Upgrade Assistant allows you to upgrade individually selected schemas or all schemas associated with a domain. The option you select determines which Upgrade Assistant screens you will use.

- Identifying Existing Schemas Available for Upgrade
  This optional task enables you to review the list of available schemas before you begin the upgrade by querying the schema version registry. The registry contains schema information such as version number, component name and ID, date of creation and modification, and custom prefix.
- Starting the Upgrade Assistant
  Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).
- Upgrading the Product Schemas Using the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to upgrade the product schemas.

- Verifying the Schema Upgrade
  After completing all the upgrade steps, verify that the upgrade was successful by checking that the schema version in `schema_version_registry` has been properly updated.

Identifying Existing Schemas Available for Upgrade

This optional task enables you to review the list of available schemas before you begin the upgrade by querying the schema version registry. The registry contains schema information such as version number, component name and ID, date of creation and modification, and custom prefix.

You can let the Upgrade Assistant upgrade all of the schemas in the domain, or you can select individual schemas to upgrade. To help decide, follow these steps to view a list of all the schemas that are available for an upgrade:

1. If you are using an Oracle database, connect to the database by using an account that has Oracle DBA privileges, and run the following from SQL*Plus:

   ```
   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;
   ```

2. Examine the report that is generated.

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

3. Note the schema prefix name that was used for your existing schemas. You will use the same prefix when you create new 12*c* (12.2.1.3.0) schemas.

Notes:

- If your existing schemas are not from a supported version, then you must upgrade them to a supported version before using the 12*c* (12.2.1.3.0) upgrade procedures. Refer to your pre-upgrade version documentation for more information.
- Some components, such as Oracle Enterprise Data Quality, Oracle GoldenGate Monitor, and Oracle GoldenGate Veridata, support an upgrade from versions other than the standard Oracle Fusion Middleware supported versions.
- If you used an OID-based policy store in the earlier versions, make sure to create a new OPSS schema before you perform the upgrade. After the upgrade, the OPSS schema remains an LDAP-based store.
- You can only upgrade schemas for products that are available for upgrade in Oracle Fusion Middleware release 12*c* (12.2.1.3.0). Do not attempt to upgrade a domain that includes components that are not yet available for upgrade to 12*c* (12.2.1.3.0).

Starting the Upgrade Assistant

Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

To start the Upgrade Assistant:

> **Note:**
>
> Before you start the Upgrade Assistant, make sure that the JVM character encoding is set to UTF-8 for the platform on which the Upgrade Assistant is running. If the character encoding is not set to UTF-8, then you will not be able to download files containing Unicode characters in their names. This can cause the upgrade to fail.

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant:
   - (UNIX) `./ua`
   - (Windows) `ua.bat`

For information about other parameters that you can specify on the command line, such as logging parameters, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 6-4 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.

Table 6-4 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `–logLevel TRACE` is used.

Table 6-4 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Upgrading the Product Schemas Using the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to upgrade the product schemas.

To upgrade the OPSS and IAU schemas:

1. On the Welcome screen, review an introduction to the Upgrade Assistant and information about important pre-upgrade tasks. Click **Next**.

   > **Note:**
   >
   > For more information about any Upgrade Assistant screen, click **Help** on the screen.

2. On the Selected Schemas screen, select the following option:
   - **Individually Selected Schemas** if you want to select individual schemas for upgrade and you do not want to upgrade all of the schemas used by the domain.

> **Caution:**
>
> Upgrade only those schemas that are used to support your 12*c* (12.2.1.3.0) components. Do not upgrade schemas that are currently being used to support components that are not included in Oracle Fusion Middleware 12*c* (12.2.1.3.0).

Click **Next**.

3. The Available Components 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.

   Select **Oracle Platform Security Services**. Selecting this automatically selects **Oracle Audit Services**. Click **Next**.

4. On the Domain Directory screen, enter the 12*c* (12.1.2.0.0, 12.1.3.0.0, 12.2.1.0.0, 12.2.1.1.0, and 12.2.1.2.0) WebLogic domain directory. Click **Browse** and use the navigation tree to select the 12*c* WebLogic domain directory.

   The Upgrade Assistant requires the 12*c* domain location to access the jps-config.xml file.

5. On the Prerequisites screen, acknowledge that the prerequisites have been met by selecting all the check boxes. Click **Next**.

   > **Note:**
   >
   > The Upgrade Assistant does not verify whether the prerequisites have been met.

6. On the Create Schemas screen, specify if you want the Upgrade Assistant to create the missing schemas. By default the **Create missing schemas for the specified domain** option is enabled. The Upgrade Assistant will attempt to create the missing schemas for the domain using the database connection details and schema owner name provided. The Upgrade Assistant creates the schemas using the default tablespace settings.

   Select **Use same passwords for all schemas** if the same password is used for all schemas. Enter and confirm the password in the table. You only have to supply the password once.

   > **Note:**
   >
   > Do not allow the Upgrade Assistant to create schemas for you if you require customized options for your schemas. The schemas are created using the default Repository Creation Utility (RCU) settings. For example, if your schemas require additional tablespace, you must use the RCU to create the schemas.
   >
   > If you do not want the Upgrade Assistant to create these schemas for you, deselect the **Create missing schemas for the specified domain** option and click **Next**. You will have to run the Repository Creation Utility to create the schemas.

7. The Create Schema Defaults screen appears if you selected the **Create missing schemas for the specified domain** option. The default datafile size is listed for each component schema and auxiliary schema. If you need to modify the size of the tablespace datafile ,or make any other changes to the default schema settings, use the Repository Creation Utility to create the schemas. You cannot modify the tablespace settings from the Upgrade Assistant.

8. On the Examine screen, review the status of the Upgrade Assistant as it examines each schema, verifying that the schema is ready for upgrade. If the status is **Examine finished**, click **Next**.

   If the examine phase fails, Oracle recommends that you cancel the upgrade by clicking **No** in the Examination Failure dialog. Click **View Log** to see what caused the error and refer to Troubleshooting Your Upgrade in *Upgrading with the Upgrade Assistant* for information on resolving common upgrade errors.

   > **Note:**
   >
   > - If you resolve any issues detected during the examine phase without proceeding with the upgrade, you can start the Upgrade Assistant again without restoring from backup. However, if you proceed by clicking **Yes** in the Examination Failure dialog box, you need to restore your pre-upgrade environment from backup before starting the Upgrade Assistant again.
   > - Canceling the examination process has no effect on the schemas or configuration data; the only consequence is that the information the Upgrade Assistant has collected must be collected again in a future upgrade session.

9. On the Upgrade Summary screen, review the summary of the schemas that will be upgraded and/or created.

   Verify that the correct Source and Target Versions are listed for each schema you intend to upgrade.

   If you want to save these options to a response file to run the Upgrade Assistant again later in response (or silent) mode, click **Save Response File** and provide the location and name of the response file. A silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again.

   Click **Next** .

10. On the Upgrade Progress screen, monitor the status of the upgrade.

    > **Caution:**
    >
    > Allow the Upgrade Assistant enough time to perform the upgrade. Do not cancel the upgrade operation unless absolutely necessary. Doing so may result in an unstable environment.

    If any schemas are not upgraded successfully, refer to the Upgrade Assistant log files for more information.

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.

Click **Next**.

11. If the upgrade is successful: On the Upgrade Success screen, click **Close** to complete the upgrade and close the wizard.

    If the upgrade fails: On the Upgrade Failure screen, click **View Log** to view and troubleshoot the errors. The logs are available at *NEW_ORACLE_HOME*/oracle_common/upgrade/logs.

Note:

If the upgrade fails, you must restore your pre-upgrade environment from backup, fix the issues, then restart the Upgrade Assistant.

Verifying the Schema Upgrade

After completing all the upgrade steps, verify that the upgrade was successful by checking that the schema version in schema_version_registry has been properly updated.

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 ;
```

In the query result:

- Check that the number in the VERSION column matches the latest version number for that schema. For example, verify that the schema version number is 12.2.1.3.0.

Note:

However, that not all schema versions will be updated. Some schemas do not require an upgrade to this release and will retain their pre-upgrade version number.

- 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.

- Synonym objects owned by `IAU_APPEND` and `IAU_VIEWER` will appear as `INVALID`, but that does not indicate a failure.

  They become invalid because the target object changes after the creation of the synonym. The synonyms objects will become valid when they are accessed. You can safely ignore these `INVALID` objects.

About Reconfiguring the Domain

Run the Reconfiguration Wizard to reconfigure your domain component configurations to 12*c* (12.2.1.3.0).

When you reconfigure a standalone domain, the following items are automatically updated, depending on the applications in the domain:

- WebLogic Server 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 version of the target Oracle HTTP Server.
- The reconfiguration template for Oracle HTTP Server is automatically selected and applied to the domain. This template defines any reconfiguration tasks that are required to make the standalone domain compatible with the target Oracle HTTP Server version.
- The start scripts are updated.

  If you want to preserve your modified start scripts, be sure to back them up before starting the Reconfiguration Wizard.

> **Note:**
>
> When the domain reconfiguration process starts, you can’t undo the changes that it makes. Before running the Reconfiguration Wizard, ensure that you have backed up the domain as covered in the pre-upgrade checklist. 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 before reconfiguration.

Follow these instructions to reconfigure the existing domain using the Reconfiguration Wizard. See Reconfiguring WebLogic Domains in *Upgrading Oracle WebLogic Server*.

- Backing Up the Domain

- Starting the Reconfiguration Wizard
- Reconfiguring the Domain with the Reconfiguration Wizard
  Navigate through the screens in the Reconfiguration Wizard to reconfigure your existing domain.

Backing Up the Domain

Before running the Reconfiguration Wizard, create a backup copy of the domain directory.

To create a backup of the domain directory:

1. Copy the source domain to a separate location to preserve the contents.

   (Windows) `copy C:\domains\mydomain to C:\domains\mydomain_backup`.

   (UNIX) `cp mydomain /domains/mydomain_backup`
2. Before updating the domain on each remote Managed Server, create 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 before reconfiguration.

Starting the Reconfiguration Wizard

> **Note:**
>
> Shut down the administration server and all collocated managed servers before starting the reconfiguration process. See Stopping Servers and Processes .

To start the Reconfiguration Wizard in graphical mode:

1. Sign 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. Go to the `oracle_common/common/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/common/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\commom\bin`
4. Start the Reconfiguration Wizard with the following logging options:
   - (UNIX) `./reconfig.sh -log=`*`log_file`*` -log_priority=ALL`
   - (Windows) `reconfig.cmd -log=`*`log_file`*` -log_priority=ALL`

   where *`log_file`* is 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 this command, the following error message might appear 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
> ```

Reconfiguring the Domain with the Reconfiguration Wizard

Navigate through the screens in the Reconfiguration Wizard to reconfigure your existing domain.

To reconfigure the domain:

1. On the Select Domain screen, specify the location of the domain you want to upgrade or click **Browse** to navigate and select the domain directory. Click **Next**.
2. On the Reconfiguration Setup Progress screen, view the progress of the setup process. When complete, click **Next**.

   During this process:

   - The reconfiguration templates for your installed products, including Fusion Middleware products, are automatically applied. This updates various domain configuration files such as `config.xml`, `config-groups.xml`, and `security.xml` (among others).
   - Schemas, scripts, and other such files that support your Fusion Middleware products are updated.
   - The domain upgrade is validated.
3. On the Domain Mode and JDK screen, select the JDK to use in the domain or click **Browse** to navigate to the JDK you want to use. The supported JDK version for 12*c* (12.2.1.3.0) is 1.8.0_131 and later. Click **Next**.

   > **Note:**
   >
   > You cannot change the **Domain Mode** at this stage.

   For a list of JDKs that are supported for a specific platform, see Oracle Fusion Middleware Supported System Configurations.
4. On the JDBC Data Sources screen, configure the JDBC data sources defined in your domain source.

   The JDBC data sources associated with the products for which you are creating the domain are listed in the lower half of the screen. A JDBC data source contains a pool of database connections that are created when the data source instance is created, deployed or targeted, or at server startup. Applications look up a data source on the JNDI tree, and then request a connection. When the applications no longer need the connections, they return the connections to the connection pool in the data source.

From the **Data Source Name** drop-down list, select the data source(s) for which you want to specify the settings. The values that you specify are displayed in the appropriate columns in the data source list, for the selected data source.

For Oracle RAC Configuration for data sources, you can select one of the three options:

- Convert to GridLink
- Convert to RAC multi data source
- Don’t convert

For more information about each option, click **Help**.

After specifying the details, click **Next**.

If you do not select any data sources on the JDBC Data Sources screen, the following warning displays:

```
Missing Driver
```

```
Click Ok to proceed without verification, click Cancel to return
to the JDBC Data Sources page.
```

In this case, if you click **Ok**, the data sources are not verified.

5. On the JDBC Data Sources Test screen, select the check box for the data source connection you configured on the JDBC Data Sources screen and click **Test Selected Connections** to test the data source connection.

> **Note:**
>
> To test the database connections, the database to which you are connecting must be running. If you do not want to test the connections at this time, do not select any data sources. Click **Next** to continue.

6. On the Database Configuration Type screen, select **RCU Data** to connect to the Server Table (_STB) schema.

   Enter the database connection details using the RCU service table (_STB) schema credentials and click **Get RCU Configuration**.

   The Reconfiguration Wizard uses this connection to automatically configure the data sources required for components in your domain.

> **Note:**
>
> By default **Oracle’s Driver (Thin) for Service connections; Versions: Any** is the selected driver. If you specified an instance name in your connection details — instead of the service name — you must select **Oracle’s Driver (Thin) for pooled instance connections; Versions: Any** If you do not change the driver type, then the connection will fail.

> **Note:**
>
> For any existing 12*c* (12.2.1.2.0) datasource, the reconfiguration will preserve the existing values. For new datasources where the schema was created for 12*c* (12.2.1.3.0) by the RCU, the default connection data will be retrieved from the _STB schema. If no connection data for a given schema is found in the _STB schema, then the default connection data is used.

If the check is successful, click **Next**. If the check fails, reenter the connection details correctly and try again.

> **Note:**
>
> If you are upgrading from 12*c* (12.2.1.2.0), and your database has _OPSS or _IAU 12*c* (12.2.1.2.0) database schemas, you must manually enter database connection details for those schemas. These schemas were not required in 12c and had to be created manually. Users could assign any name to these schemas, therefore the Reconfiguration Wizard does not recognize them. When providing connection information for _IAU, use the IAU_APPEND user information.

7. On the JDBC Component Schema Test screen, select all the component schemas and click **Test Selected Connections** to test the connection for each schema. The result of the test is indicated in the Status column.

   When the check is complete, click **Next**.

8. The Node Manager screen is only displayed if the domain you are reconfiguring is currently using a per host Node Manager.

   On the Node Manager screen, 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**.

Table 6-5   Field Descriptions for Node Manager Screen

Option	Description
Per Domain Default Location	If you select this option, the Node Manager home is redefined to `*DOMAIN_NAME*/nodemanager` and you cannot edit the Node Manager home.
Per Domain Custom Location	Select this option if you want the per domain Node Manager configuration files to be created in a specific location for this domain. Specify the directory in the **Node Manager Home** field, or click **Browse** to use the navigation tree to select the location. The specified directory must be empty. The nodemanager.properties and nodemanager.domains files are created in this directory.

Table 6-5 (Cont.) Field Descriptions for Node Manager Screen

Option	Description
Node Manager Home	If you selected the **Per Domain Custom Location** option, click **Browse** to navigate to the directory location that you want to use to store the per domain Node Manager configuration.
Manual Node Manager Setup	If you select this option, creation of the Node Manager configuration for the domain is skipped (all remaining fields cannot be modified), and if you want to use Node Manager in the domain, you must manually configure Node Manager as described in Completing the Node Manager Configuration. The reconfigured domain will still use a per host Node Manager configuration. You should also select this option if your existing domain is not configured to use Node Manager and you do not want to use Node Manager in the reconfigured domain. For more information about Node Manager configuration, see Administering Node Manager for Oracle WebLogic Server.
Node Manager Configuration	Select one of the following two options. These fields are not available if you selected **Manual Node Manager Setup**.
Create New Configuration	A per domain Node Manager configuration will be automatically created for the reconfigured domain using default settings in nodemanager.properties. If necessary, you can modify nodemanager.properties after the domain has been successfully reconfigured.
Migrate Existing Configuration	The existing per host Node Manager configuration will be migrated to a per domain configuration for the reconfigured domain. This does not include environment-specific settings for ListenAddress, ListenPort, StartScriptName, JavaHome, and LogFile.
Node Manager Home	If you selected the **Migrate Existing Configuration** option, enter or browse to the Node Manager home directory that you want to migrate to the reconfigured domain.

Table 6-5 (Cont.) Field Descriptions for Node Manager Screen

Option	Description

Apply Oracle Recommended Defaults	If you selected the **Migrate Existing Configuration** option, select this check box if you want to use Oracle-recommended defaults in the nodemanager.properties file. Deselect this check box if you want to continue using the settings in the nodemanager.properties file being migrated.
	Oracle-recommended properties with default values are as follows:
	`LogLimit=0`
	`AuthenticationEnabled=true`
	`LogLevel=INFO`
	`DomainsFileEnabled=true`
	`NativeVersionEnabled=true`
	`LogToStderr=true`
	`SecureListener=true`
	`LogCount=1`
	`StopScriptEnabled=false`
	`QuitEnabled=false`
	`LogAppend=true`
	`StateCheckInterval=500`
	`CrashRecoveryEnabled=false`
	`StartScriptEnabled=true`
	`LogFormatter=weblogic.nodemanager.server.LogFormatter`
	`ListenBacklog=50`

Node Manager Credentials: Username, Password	Specify the username and password that you want to use to start Node Manager in the reconfigured domain.

9. On the Advanced Configuration screen, you can select all categories for which you want to perform advanced configuration. For each category you select, the appropriate configuration screen is displayed to allow you to perform advanced configuration.

   > **Note:**
   >
   > The categories that are listed on the Advanced Configuration screen depend on the resources defined in the templates you selected for the domain.

   For this upgrade, select none of the options and click **Next**.

10. On the Configuration Summary screen, review the detailed configuration settings of the domain before continuing.

    You can limit the items that are displayed in the right-most panel by selecting a filter option from the **View** drop-down list.

    To change the configuration, click **Back** to return to the appropriate screen. To reconfigure the domain, click **Reconfig**.

> **Note:**
>
> The location of the domain does not change when you reconfigure it.

11. The Reconfiguration Progress screen displays the progress of the reconfiguration process.

    During this process:

    - Domain information is extracted, saved, and updated.
    - Schemas, scripts, and other such files that support your Fusion Middleware products are updated.

    When the progress bar shows 100%, click **Next**.

12. The End of Configuration screen indicates whether the reconfiguration process completed successfully or failed. It also displays the location of the domain that was reconfigured as well as the Administration Server URL (including the listen port). If the reconfiguration is successful, it displays **Oracle WebLogic Server Reconfiguration Succeeded**.

    If the reconfiguration process did not complete successfully, an error message is displayed indicates the reason. Take appropriate action to resolve the issue. If you cannot resolve the issue, contact My Oracle Support.

    Note the Domain Location and the Admin Server URL for further operations.

Upgrading Domain Component Configurations

After reconfiguring the domain, use the Upgrade Assistant to upgrade the domain *component* configurations inside the domain to match the updated domain configuration.

- Starting the Upgrade Assistant
  Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).
- Upgrading Domain Components Using the Upgrade Assistant
  Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.
- Verifying the Domain-Specific-Component Configurations Upgrade
  To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

Starting the Upgrade Assistant

Run the Upgrade Assistant to upgrade product schemas, domain component configurations, or standalone system components to 12*c* (12.2.1.3.0).

To start the Upgrade Assistant:

> **Note:**
>
> Before you start the Upgrade Assistant, make sure that the JVM character encoding is set to UTF-8 for the platform on which the Upgrade Assistant is running. If the character encoding is not set to UTF-8, then you will not be able to download files containing Unicode characters in their names. This can cause the upgrade to fail.

1. Go to the `oracle_common/upgrade/bin` directory:
   - (UNIX) *`NEW_ORACLE_HOME`*`/oracle_common/upgrade/bin`
   - (Windows) *`NEW_ORACLE_HOME`*`\oracle_common\upgrade\bin`
2. Start the Upgrade Assistant:
   - (UNIX) `./ua`
   - (Windows) `ua.bat`

For information about other parameters that you can specify on the command line, such as logging parameters, see:

- Upgrade Assistant Parameters

Upgrade Assistant Parameters

When you start the Upgrade Assistant from the command line, you can specify additional parameters.

Table 6-6 Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-readiness`	Required for readiness checks **Note**: Readiness checks cannot be performed on standalone installations (those not managed by the WebLogic Server).	Performs the upgrade readiness check without performing an actual upgrade. Schemas and configurations are checked. Do not use this parameter if you have specified the `-examine` parameter.
`-threads`	Optional	Identifies the number of threads available for concurrent schema upgrades or readiness checks of the schemas. The value must be a positive integer in the range 1 to 8. The default is 4.

Table 6-6 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description
`-response`	Required for silent upgrades or silent readiness checks	Runs the Upgrade Assistant using inputs saved to a response file generated from the data that is entered when the Upgrade Assistant is run in GUI mode. Using this parameter runs the Upgrade Assistant in *silent mode* (without displaying Upgrade Assistant screens).
`-examine`	Optional	Performs the examine phase but does not perform an actual upgrade. Do not specify this parameter if you have specified the `-readiness` parameter.
`-logLevel` *`attribute`*	Optional	Sets the logging level, specifying one of the following attributes: • `TRACE` • `NOTIFICATION` • `WARNING` • `ERROR` • `INCIDENT_ERROR` The default logging level is `NOTIFICATION`. Consider setting the `-logLevel TRACE` attribute to so that more information is logged. This is useful when troubleshooting a failed upgrade. The Upgrade Assistant's log files can become very large if `-logLevel TRACE` is used.

Table 6-6 (Cont.) Upgrade Assistant Command-Line Parameters

Parameter	Required or Optional	Description

`-logDir` *`location`*	Optional	Sets the default location of upgrade log files and temporary files. You must specify an existing, writable directory where the Upgrade Assistant creates log files and temporary files.
		The default locations are:
		(UNIX)
		`NEW_ORACLE_HOME``/oracle_common/upgrade/logs`
		`NEW_ORACLE_HOME``/oracle_common/upgrade/temp`
		(Windows)
		`NEW_ORACLE_HOME``\oracle_common\upgrade\logs`
		`NEW_ORACLE_HOME``\oracle_common\upgrade\temp`

`-help`	Optional	Displays all of the command-line options.

Upgrading Domain Components Using the Upgrade Assistant

Navigate through the screens in the Upgrade Assistant to upgrade component configurations in the WebLogic domain.

After running the Reconfiguration Wizard to reconfigure the WebLogic domain to 12*c* (12.2.1.3.0), you must run the Upgrade Assistant to upgrade the domain *component* configurations to match the updated domain configuration.

To upgrade domain component configurations with the Upgrade Assistant:

1. On the Welcome screen, review an introduction to the Upgrade Assistant and information about important pre-upgrade tasks. Click **Next**.

   > **Note:**
   >
   > For more information about any Upgrade Assistant screen, click **Help** on the screen.

2. On the WebLogic Components screen, select the **WebLogic Component Configurations** option to upgrade component configurations for a managed WebLogic Server domain. Enter the connection details required to connect to the WebLogic Administration Server that is managing the domain and click **Next**.
3. On the Component List screen, verify that the list includes all the components for which you want to upgrade configurations and click **Next**.

If you do not see the components you want to upgrade, click **Back** to go to the previous screen and specify a different domain.

4. On the Prerequisites screen, acknowledge that the prerequisites have been met by selecting all the check boxes. Click **Next**.

> **Note:**
>
> The Upgrade Assistant does not verify whether the prerequisites have been met.

5. On the Examine screen, review the status of the Upgrade Assistant as it examines each component, verifying that the component configuration is ready for upgrade. If the status is **Examine finished**, click **Next**.

   If the examine phase fails, Oracle recommends that you cancel the upgrade by clicking **No** in the Examination Failure dialog. Click **View Log** to see what caused the error and refer to Troubleshooting Your Upgrade in *Upgrading with the Upgrade Assistant* for information on resolving common upgrade errors.

> **Note:**
>
> - If you resolve any issues detected during the examine phase without proceeding with the upgrade, you can start the Upgrade Assistant again without restoring from backup. However, if you proceed by clicking **Yes** in the Examination Failure dialog box, you need to restore your pre-upgrade environment from backup before starting the Upgrade Assistant again.
> - Canceling the examination process has no effect on the configuration data; the only consequence is that the information the Upgrade Assistant has collected must be collected again in a future upgrade session.

6. On the Upgrade Summary screen, review the summary of the options you have selected for component configuration upgrade.

   The response file collects and stores all the information that you have entered, and enables you to perform a silent upgrade at a later time. The silent upgrade performs exactly the same function that the Upgrade Assistant performs, but you do not have to manually enter the data again. If you want to save these options to a response file, click **Save Response File** and provide the location and name of the response file.

   Click **Upgrade** to start the upgrade process.

7. On the Upgrade Progress screen, monitor the status of the upgrade.

> **Caution:**
>
> Allow the Upgrade Assistant enough time to perform the upgrade. Do not cancel the upgrade operation unless absolutely necessary. Doing so may result in an unstable environment.

If any components are not upgraded successfully, refer to the Upgrade Assistant log files for more information.

> **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.

Click **Next**.

8. If the upgrade is successful: On the Upgrade Success screen, click **Close** to complete the upgrade and close the wizard. The Post-Upgrade Actions window describes the manual tasks you must perform to make components functional in the new installation. This window appears only if a component has post-upgrade steps.

   If the upgrade fails: On the Upgrade Failure screen, click **View Log** to view and troubleshoot the errors. The logs are available at `*NEW_ORACLE_HOME*/oracle_common/upgrade/logs`.

   > **Note:**
   >
   > If the upgrade fails you must restore your pre-upgrade environment from backup, fix the issues, then restart the Upgrade Assistant.

Verifying the Domain-Specific-Component Configurations Upgrade

To verify that the domain-specific-component configurations upgrade was successful, sign in to the Administration console and the Oracle Enterprise Manager Fusion Middleware Control and verify that the version numbers for each component is 12.2.1.3.0.

To sign in to the Administration Console, go to: `http://`*`administration_server_host`*`:`*`administration_server_port`*`/console`

To sign in to Oracle Enterprise Manager Fusion Middleware Control Console, go to: `http://`*`administration_server_host`*`:`*`administration_server_port`*`/em`

> **Note:**
>
> After upgrade, make sure you run the administration tools from the new 12*c* (12.2.1.3.0) Oracle home directory and not from the previous Oracle home directory.
>
> During the upgrade process, some OWSM documents, including policy sets and predefined documents such as policies and assertion templates, may need to be upgraded. If a policy set or a predefined document is upgraded, its version number is incremented by 1.
>
> If you created the FMW user to run the Upgrade Assistant, ensure that you delete the account after verifying your upgrade was successful.

Starting Servers and Processes

After a successful upgrade, restart all processes and servers, including the Administration Server and any Managed Servers.

The components may be dependent on each other so they must be started in the correct order.

> **Note:**
>
> The procedures in this section describe how to start servers and process using the WLST command line or a script. You can also use the Oracle Fusion Middleware Control and the Oracle WebLogic Server Administration Console. See Starting and Stopping Administration and Managed Servers and Node Manager in *Administering Oracle Fusion Middleware.*

To start your Fusion Middleware environment, follow the steps below:

Step 1: Start the Administration Server

When you start the Administration Server, you also start the processes running in the Administration Server, including the WebLogic Server Administration Console and Fusion Middleware Control.

To start the Administration Server, use the `startWebLogic` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startWebLogic.sh`
- (Windows) `NEW_DOMAIN_HOME\bin\startWebLogic.cmd`

When prompted, enter your user name, password, and the URL of the Administration Server.

Step 2: Start Node Manager

To start Node Manager, use the `startNodeManager` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startNodeManager.sh`
- (Windows) `NEW_DOMAIN_HOME\bin\startNodeManager.cmd`

Step 3: Start Oracle Identity Management Components

Start any Oracle Identity Management components, such as Oracle Internet Directory, that form part of your environment:

- (UNIX) `NEW_DOMAIN_HOME/bin/startComponent.sh component_name`
- (Windows) `NEW_DOMAIN_HOME\bin\startComponent.cmd component_name`

Step 4: Start the Managed Servers

To start a WebLogic Server Managed Server, use the `startManagedWebLogic` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startManagedWebLogic.sh managed_server_name admin_url`
- (Windows) `NEW_DOMAIN_HOME\bin\startManagedWebLogic.cmd managed_server_name admin_url`

When prompted, enter your user name and password.

> **Note:**
>
> The startup of a Managed Server will typically start the applications that are deployed to it. Therefore, it should not be necessary to manually start applications after the Managed Server startup.

Step 5: Start System Components

To start system components, such as Oracle HTTP Server, use the `startComponent` script:

- (UNIX) `NEW_DOMAIN_HOME/bin/startComponent.sh component_name`
- (Windows) `NEW_DOMAIN_HOME\bin\startComponent.cmd component_name`

You can start system components in any order.

- Starting the Oracle HTTP Server
  You can use Enterprise Manager Fusion Middleware Control to start, stop, and restart Oracle HTTP Server.

Starting the Oracle HTTP Server

You can use Enterprise Manager Fusion Middleware Control to start, stop, and restart Oracle HTTP Server.

You can start the Oracle HTTP Server with the Node Manager by following the procedure mentioned in Running Oracle HTTP Server Remotely in *Administering Oracle HTTP Server*.

To start an Oracle HTTP Server using Enterprise Manager Fusion Middleware Control:

1. Go to the Oracle HTTP Server home page.
2. From the Oracle HTTP Server menu:
   a. Select **Control**.

   b. Select **Start Up** from the **Control** menu.

   Or

3. From the Target Navigation tree:
   a. Right-click the Oracle HTTP Server instance you want to start.
   b. Select **Control**.
   c. Select **Start Up** from the **Control** menu.

Verifying the Upgrade

If you can log in to the Administration Console, the Enterprise Manager Fusion Middleware Control, and the OHS Home Page, then your upgrade is successful.

To verify the upgrade:

1. Access the OHS default home page by using the following URL:

   http://*MachineName*:7777

2. Access Enterprise Manager Fusion Middleware Control by using the following URL:

   http://*MachineName*:7001/em

A

Replacing Certificate Signed Using MD5 Algorithm with Certificate Signed Using SHA-2 Algorithm

Oracle strongly recommends that you refrain from using a certificate signed with Message Digest 5 Algorithm (MD5), because the security of MD5 algorithm has been compromised. Therefore, you must replace the certificate signed using MD5 algorithm with a certificate signed with Secure Hashing Algorithm 2 (SHA-2). By default, certificates signed using MD5 algorithm are no longer supported in Oracle HTTP Server.

- How to Check whether Certificate Signed with MD5 Algorithm is Present in the Wallet?
  You can use the orapki utility to display whether your wallet contains a certificate signed with MD5 algorithm.
- Removing Certificate Signed with MD5 Algorithm from the Wallet
  If MDS is present in your wallet, the signature algorithm name is displayed as `MDSwithRSA`. You must replace this certificate with certificate signed using SHA2 algorithm.
- Adding Certificate Signed with SHA-2 Algorithm to the Wallet
  If you are using CA-signed user certificate that is signed with MD5 algorithm, contact your certificate authority to a get a new user certificate signed with SHA-2 algorithm and import it in to the wallet.
- Enabling Support for Certificate Signed with MD5 Algorithm in your 12.2.1.3.0 Oracle HTTP Server Deployment
  By default, support of certificate signed with MD5 algorithm has been removed because the security of MD5 algorithm is severely compromised. If you still want to use certificate signed using MD5 algorithm, you can enable the support for a certificate signed with MD5 algorithm by following the procedure in this section. However, enabling support for certificates signed using MD5 algorithm is not recommended.

How to Check whether Certificate Signed with MD5 Algorithm is Present in the Wallet?

You can use the orapki utility to display whether your wallet contains a certificate signed with MD5 algorithm.

To check whether the MD5 certificate is present in your wallet:

1. Locate orapki and the keytool path:

   (orapki) *`ORACLE_HOME`*`/oracle_common/bin/orapki`

   (Keytool) *`ORACLE_HOME`*`/oracle_common/jdk/jre/bin`

2. Set the JAVA_HOME environment variable as follows:

   ```
   export JAVA_HOME=ORACLE_HOME/oracle_common/jdk/jre/
   ```

3. Enter the following command to display the contents of the wallet:

```
orapki wallet display -wallet wallet_location
```

Sample command:

```
ORACLE_HOME/oracle_common/bin/orapki wallet display -
wallet /scratch/ohs12.2.1.x_install/walletohs2/
```

Output:

```
Oracle PKI Tool : Version 12.2.0.1.0
Copyright (c) 2004, 2016, Oracle and/or its affiliates. All rights
reserved.

Requested Certificates:
User Certificates:
Subject: CN=www.xyx.com,C=IN
Trusted Certificates:
Subject: CN=www.xyx.com,C=IN
```

4. Identify the domain name (DN) of the certificate present in the wallet. In this example, Subject of User Certificates is the DN of the certificate present in the wallet; which is `CN=www.xyx.com,C=IN`.

5. Export the certificate present in the wallet as shown in the following example:

   ```
   orapki wallet export -wallet wallet_Location -dn 'DN_string'
   -cert certificate_file
   ```

   Sample command:

   ```
   ORACLE_HOME/oracle_common/bin/orapki wallet export -wallet /
   scratch/ohs12.2.1.x_install/walletohs2/ -
   dn  'CN=www.xyx.com,C=IN' -cert wallet.cert
   ```

6. Use the keytool to check the signature algorithm used to sign the *certificate_file* that you exported in the previous step by entering the following command:

   ```
   ORACLE_HOME/oracle_common/jdk/jre/bin/keytool -printcert -
   file certificate_file
   ```

   Sample command:

   ```
   /scratch/ohs12.2.1.x_install/oracle_common/jdk/jre/bin/
   keytool -printcert -file wallet.cert
   ```

   Output:

   ```
   Owner: CN="Self-Signed Certificate for ohs3 ", OU=OAS, O=ORACLE,
   L=REDWOODSHORES, ST=CA, C=US
   Issuer: CN="Self-Signed Certificate for ohs3 ", OU=OAS, O=ORACLE,
   L=REDWOODSHORES, ST=CA, C=US
   Serial number: cd7081c47adb9ff867da01e3fe383e0f
   Valid from: Fri Jul 01 04:21:40 PDT 2016 until: Sat Jun 19 04:21:40
   PDT 2066
   Certificate fingerprints:
    MD5: 89:4D:C4:B4:28:7E:D4:0A:93:CA:E4:97:0C:F0:CE:86
    SHA1: 53:FB:D6:58:0D:09:85:E9:6D:55:E2:92:E7:87:08:B8:65:92:15:9E
    Signature algorithm name: MD5withRSA
    Version: 1
   ```

Signature algorithm name: MD5withRSA implies that MD5 algorithm is being used to sign the certificate present in the wallet.

Removing Certificate Signed with MD5 Algorithm from the Wallet

If MDS is present in your wallet, the signature algorithm name is displayed as `MDSwithRSA`. You must replace this certificate with certificate signed using SHA2 algorithm.

To remove a certificate signed with MD5 algorithm from your wallet:

1. Enter the following command to remove a user certificate signed using MD5 algorithm:

   ```
   orapki wallet  remove -wallet wallet_location -dn 'DN_string' -
   user_cert -auto_login_only
   ```

   Sample command:

   ```
   /scratch/ohs12.2.1.x_install/oracle_common/bin/orapki wallet
   remove -wallet /scratch/ohs12.2.1.x_install/walletohs2/ -
   dn 'CN=www.xyx.com,C=IN' -user_cert -auto_login_only
   ```

   Output:

   ```
   Oracle PKI Tool : Version 12.2.0.1.0
   Copyright (c) 2004, 2016, Oracle and/or its affiliates. All rights
   reserved.
   ```

2. If the user certificate is a self-signed certificate, you need to remove it from the *trusted certificate* and the *requested certificate* list by entering the following commands:

   ```
   orapki  wallet  remove  -wallet  wallet_location -dn  'DN_string'
   -trusted_cert  -auto_login_only
   ```

   ```
   orapki  wallet  remove  -wallet  wallet_location -dn  'DN_string'
   -cert_req  -auto_login_only
   ```

   Sample command:

   ```
   /scratch/ohs12.2.1.x_install/oracle_common/bin/orapki wallet
   remove -wallet /scratch/ohs12.2.1.x_install/walletohs2/ -dn
   'CN=www.xyx.com,C=IN' -trusted_cert -auto_login_only
   ```

   Output:

   ```
   Oracle PKI Tool : Version 12.2.0.1.0
   Copyright (c) 2004, 2016, Oracle and/or its affiliates. All rights
   reserved.
   ```

3. If a wallet has trusted certificate or a certificate request which is signed using MD5 algorithm, remove that certificate by entering the following commands:

   ```
   orapki wallet remove -wallet wallet_location -dn 'DN_string' -
   trusted_cert -auto_login_only remove cert request
   ```

   ```
   orapki wallet remove -wallet wallet_location -dn 'DN_string' -
   cert_req -auto_login_only
   ```

Adding Certificate Signed with SHA-2 Algorithm to the Wallet

If you are using CA-signed user certificate that is signed with MD5 algorithm, contact your certificate authority to a get a new user certificate signed with SHA-2 algorithm and import it in to the wallet.

To add self-signed certificate, signed using SHA-2 algorithm:

1. If certificate is self-signed, enter the following command to add self-signed certificate signed using SHA-2 algorithm:

   ```
   orapki wallet add -wallet wallet_Location  -dn 'DN_String' -
   keysize 2048 -sign_alg sha256  -self_signed -validity 9125 -
   auto_login_only
   ```

   Sample command:

   ```
   /scratch/ohs12.2.1.x_install/oracle_common/bin/orapki wallet
   add -wallet /scratch/ohs12.2.1.x_install/walletohs2/ -
   dn 'CN=www.xyx.com,C=IN' -keysize 2048 -sign_alg sha256  -
   self_signed -validity 9125 -auto_login_only
   ```

2. Add trusted certificate signed using SHA-2 algorithm to wallet by entering the following command:

   ```
   orapki -wallet add -wallet wallet_location -trusted_cert -
   cert certificate_file -auto_login_only
   ```

3. Add user certificate signed using SHA-2 algorithm to wallet by entering the following command:

   ```
   orapki -wallet add -wallet wallet_location -user_cert -cert
   certificate_file -auto_login_only
   ```

The operation is successful if you see signature algorithm name equal to *SHA256withRSA* when you print your certificate file. Following is a sample output:

```
Owner: CN=www.xyx.com, C=IN
Issuer: CN=www.xyx.com, C=IN
Serial number: f689ec6986c70f973138962eb2f0e5f9
Valid from: Wed May 11 04:01:24 PDT 2016 until: Sat Oct 27 04:01:24
PDT 2018
Certificate fingerprints:
   MD5:  D7:0F:CB:00:A7:04:33:DA:2F:8A:AD:C9:2A:9E:DF:26
   SHA1: D4:6C:51:DB:53:B5:F5:C7:60:8D:8B:95:68:E6:B0:5E:E8:00:ED:DF
   SHA256:
B1:EF:73:98:EA:6A:1A:60:FF:1F:10:89:8C:B8:16:63:71:03:1B:6E:38:D1:2D:AE
:E9:BD:3E:13:BE:AF:A0:76
   Signature algorithm name: SHA256withRSA
   Version: 1
```

Enabling Support for Certificate Signed with MD5 Algorithm in your 12.2.1.3.0 Oracle HTTP Server Deployment

By default, support of certificate signed with MD5 algorithm has been removed because the security of MD5 algorithm is severely compromised. If you still want to use certificate signed using MD5 algorithm, you can enable the support for a certificate signed with MD5 algorithm by following the procedure in this section. However, enabling support for certificates signed using MD5 algorithm is not recommended.

To enable support for a certificate signed with MD5 algorithm:

1. For Standalone Oracle HTTP Server deployment:
   a. Stop the Oracle HTTP Server instance and the Node Manager.
   b. Change to the following staging directory:

      (UNIX) `ORACLE_HOME/user_projects/domains/base_domain/config/fmwconfig/components/OHS/ohs1/`

      (Windows) `ORACLE_HOME\user_projects\domains\base_domain\config\fmwconfig\components\OHS\ohs1\`
   c. Open the `ohs.plugins.nodemanager.properties` file in edit mode and add the following line:

      ```
      environment.ORACLE_SSL_ALLOW_MD5_CERT_SIGNATURES = 1
      ```
   d. Restart the Node Manager and the Oracle HTTP Server instance.
2. For Managed Oracle HTTP Server deployment:
   a. Stop the Oracle HTTP Server instance, Node Manager, and the WebLogic Server.
   b. Change to the following staging directory:

      (UNIX) `ORACLE_HOME/user_projects/domains/base_domain/config/fmwconfig/components/OHS/ohs1/`

      (Windows) `ORACLE_HOME\user_projects\domains\base_domain\config\fmwconfig\components\OHS\ohs1\`
   c. Open the `ohs.plugins.nodemanager.properties` file in edit mode and add the following line:

      ```
      environment.ORACLE_SSL_ALLOW_MD5_CERT_SIGNATURES = 1
      ```
   d. Restart the WebLogic Server, Node Manager, and the Oracle HTTP Server instance.

You must perform this procedure for each Oracle HTTP Server instance.

B

About Updating the JDK Location After Installing an Oracle Fusion Middleware Product

The binaries and other metadata and utility scripts in the Oracle home and Domain home, such as RCU or Configuration Wizard, use a JDK version that was used while installing the software and continue to refer to the same version of the JDK. The JDK path is stored in a variable called JAVA_HOME which is centrally located in .globalEnv.properties file inside the `ORACLE_HOME/oui` directory.

The utility scripts such as config.sh|cmd, launch.sh, or opatch reside in the *ORACLE_HOME*, and when you invoke them, they refer to the JAVA_HOME variable located in .globalEnv.properties file. To point these scripts and utilities to the newer version of JDK, you must update the value of the JAVA_HOME variable in the .globalEnv.properties file by following the directions listed in Updating the JDK Location in an Existing Oracle Home .

To make the scripts and files in your Domain home directory point to the newer version of the JDK, you can follow one of the following approaches:

- Specify the path to the newer JDK on the Domain Mode and JDK screen while running the Configuration Wizard.

  For example, consider that you installed Oracle Fusion Middleware Infrastructure with the JDK version 8u191. So while configuring the WebLogic domain with the Configuration Assistant, you can select the path to the newer JDK on the Domain Mode and JDK screen of the Configuration Wizard. Example: `/scratch/jdk/jdk1.8.0_131`.

- Manually locate the files that have references to the JDK using `grep` (UNIX) or `findstr` (Windows) commands and update each reference. See Updating the JDK Location in an Existing Oracle Home .

> **Note:**
>
> If you install the newer version of the JDK in the same location as the existing JDK by overwriting the files, then you don’t need to take any action.

- Updating the JDK Location in an Existing Oracle Home
  The `getProperty.sh|cmd` script displays the value of a variable, such as JAVA_HOME, from the .globalEnv.properties file. The `setProperty.sh|cmd` script is used to set the value of variables, such as OLD_JAVA_HOME or JAVA_HOME that contain the locations of old and new JDKs in the .globalEnv.properties file.
- Updating the JDK Location in an Existing Domain Home
  You must search the references to the current JDK, for example jdk1.8.0_121 manually, and replace those instances with the location of the new JDK.

Updating the JDK Location in an Existing Oracle Home

The `getProperty.sh|cmd` script displays the value of a variable, such as JAVA_HOME, from the .globalEnv.properties file. The `setProperty.sh|cmd` script is used to set the value of variables, such as OLD_JAVA_HOME or JAVA_HOME that contain the locations of old and new JDKs in the .globalEnv.properties file.

The `getProperty.sh|cmd` and `setProperty.sh|cmd` scripts are located in the following location:

(UNIX) `ORACLE_HOME/oui/bin`
(Windows) `ORACLE_HOME\oui\bin`
Where, *ORACLE_HOME* is the directory that contains the products using the current version of the JDK, such as jdk1.8.0_121.

To update the JDK location in the .globalEnv.properties file:

1. Use the `getProperty.sh|cmd` script to display the path of the current JDK from the JAVA_HOME variable. For example:

   (UNIX) `ORACLE_HOME/oui/bin/getProperty.sh JAVA_HOME`
   (Windows) `ORACLE_HOME\oui\bin\getProperty.cmd JAVA_HOME`
   `echo JAVA_HOME`
   Where JAVA_HOME is the variable in the .globalEnv.properties file that contains the location of the JDK.

2. Back up the path of the current JDK to another variable such as OLD_JAVA_HOME in the .globalEnv.properties file by entering the following commands:

   (UNIX) `ORACLE_HOME/oui/bin/setProperty.sh -name OLD_JAVA_HOME -value specify_the_path_of_current_JDK`
   (Windows) `ORACLE_HOME\oui\bin\setProperty.cmd -name OLD_JAVA_HOME -value specify_the_path_of_current_JDK`

   This command creates a new variable called OLD_JAVA_HOME in the .globalEnv.properties file, with a value that you have specified.

3. Set the new location of the JDK in the JAVA_HOME variable of the .globalEnv.properties file, by entering the following commands:

   (UNIX) `ORACLE_HOME/oui/bin/setProperty.sh -name JAVA_HOME -value specify_the_location_of_new_JDK`
   (Windows) `ORACLE_HOME\oui\bin\setProperty.cmd -name JAVA_HOME -value specify_the_location_of_new_JDK`

   After you run this command, the JAVA_HOME variable in the .globalEnv.properties file now contains the path to the new JDK, such as jdk1.8.0_131.

Updating the JDK Location in an Existing Domain Home

You must search the references to the current JDK, for example jdk1.8.0_121 manually, and replace those instances with the location of the new JDK.

You can use the `grep` (UNIX) or `findstr` (Windows) commands to search for the jdk-related references.

You'll likely be required to update the location of JDK in the following three files:

(UNIX) `DOMAIN_HOME/bin/setNMJavaHome.sh`
(Windows) `DOMAIN_HOME\bin\setNMJavaHome.cmd`

(UNIX) `DOMAIN_HOME/nodemanager/nodemanager.properties`
(Windows) `DOMAIN_HOME\nodemanager\nodemanager.properties`

(UNIX) `DOMAIN_HOME/bin/setDomainEnv.sh`
(Windows) `DOMAIN_HOME\bin\setDomainEnv.cmd`