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Enterprise Deployment Guide for Oracle WebCenter Content

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Documentation for administrators that describes how to install and configure Oracle Fusion Middleware components in an enterprise deployment.

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Preface

This guide explains how to install, configure, and manage a highly available Oracle Fusion Middleware enterprise deployment. For more information, see [About the Enterprise Deployment Guide](#).

[Audience](#)

[Documentation Accessibility](#)

[Conventions](#)

Audience

In general, this document is intended for administrators of Oracle Fusion Middleware, who are assigned the task of installing and configuring Oracle Fusion Middleware software for production deployments.

Specific tasks can also be assigned to more specialized administrators, such as database administrators (DBAs) and network administrators, where applicable.

Documentation Accessibility

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Conventions

The following text conventions are used in this document:

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

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

Note:

This guide focuses on the implementation of the enterprise deployment reference topology on Oracle Linux systems.

The topology can be implemented on any certified, supported operating system, but the examples in this guide typically show the commands and configuration steps as they should be performed using the bash shell on Oracle Linux.

Part I

Understanding an Enterprise Deployment

It is important to understand the concept and general characteristics of a typical enterprise deployment, before configuring the Oracle WebCenter Content enterprise deployment topology.

This part of the Enterprise Deployment Guide contains the following topics.

[Enterprise Deployment Overview](#)

The Enterprise Deployment Guide provides detailed, validated instructions that help you plan, prepare, install, and configure a multi-host, secure, highly available, production topology for selected Oracle Fusion Middleware products.

[About a Typical Enterprise Deployment](#)

It is essential to understand the components of a typical enterprise deployment topology.

[Understanding the WebCenter Content Enterprise Deployment Topology](#)

The Oracle WebCenter Content enterprise deployment topology represents a specific reference implementation of the concepts described in [Understanding a Typical Enterprise Deployment](#).

Enterprise Deployment Overview

The Enterprise Deployment Guide provides detailed, validated instructions that help you plan, prepare, install, and configure a multi-host, secure, highly available, production topology for selected Oracle Fusion Middleware products.

This chapter introduces the concept of an Oracle Fusion Middleware enterprise deployment. It also provides information on when to use the Enterprise Deployment guide.

About the Enterprise Deployment Guide

An Enterprise Deployment Guide provides a comprehensive, scalable example for installing, configuring, and maintaining a secure, highly available, production-quality deployment of selected Oracle Fusion Middleware products. This resulting environment is known as an **enterprise deployment topology**.

When to Use the Enterprise Deployment Guide

This guide describes one of three primary installation and configuration options for Oracle Fusion Middleware. Use this guide to help you plan, prepare, install, and configure a multi-host, secure, highly available, production topology for selected Oracle Fusion Middleware products.

1.1 About the Enterprise Deployment Guide

An Enterprise Deployment Guide provides a comprehensive, scalable example for installing, configuring, and maintaining a secure, highly available, production-quality deployment of selected Oracle Fusion Middleware products. This resulting environment is known as an **enterprise deployment topology**.

By example, the enterprise deployment topology introduces key concepts and best practices that you can use to implement a similar Oracle Fusion Middleware environment for your organization.

Each Enterprise Deployment Guide provides detailed, validated instructions for implementing the reference topology. Along the way, the guide offers links to supporting documentation that explains concepts, reference material, and additional options for an Oracle Fusion Middleware enterprise deployment.

Note that the enterprise deployment topologies described in the enterprise deployment guides cannot meet the exact requirements of all Oracle customers. In some cases, you can consider alternatives to specific procedures in this guide, depending on whether the variations to the topology are documented and supported by Oracle.

Oracle recommends customers use the Enterprise Deployment Guides as a first option for deployment. If variations are required, then those variations should be verified by reviewing related Oracle documentation or by working with Oracle Support.

1.2 When to Use the Enterprise Deployment Guide

This guide describes one of three primary installation and configuration options for Oracle Fusion Middleware. Use this guide to help you plan, prepare, install, and configure a multi-host, secure, highly available, production topology for selected Oracle Fusion Middleware products.

Alternatively, you can:

- Review *Planning an Installation of Oracle Fusion Middleware*, which provides additional information to help you prepare for any Oracle Fusion Middleware installation.

About a Typical Enterprise Deployment

It is essential to understand the components of a typical enterprise deployment topology.

This chapter provides information on Enterprise Deployment Topology diagram.

[Diagram of a Typical Enterprise Deployment](#)

This diagram shows all the components of a typical enterprise deployment, including the Web tier, application tier and data tier. All enterprise deployments are based on these basic principles.

[About the Typical Enterprise Deployment Topology Diagram](#)

A typical enterprise deployment topology consists of a Hardware Load Balancer (LBR), Web Tier, Application Tier, and Data Tier. You can obtain detailed information on these components in this section.

2.1 Diagram of a Typical Enterprise Deployment

This diagram shows all the components of a typical enterprise deployment, including the Web tier, application tier and data tier. All enterprise deployments are based on these basic principles.

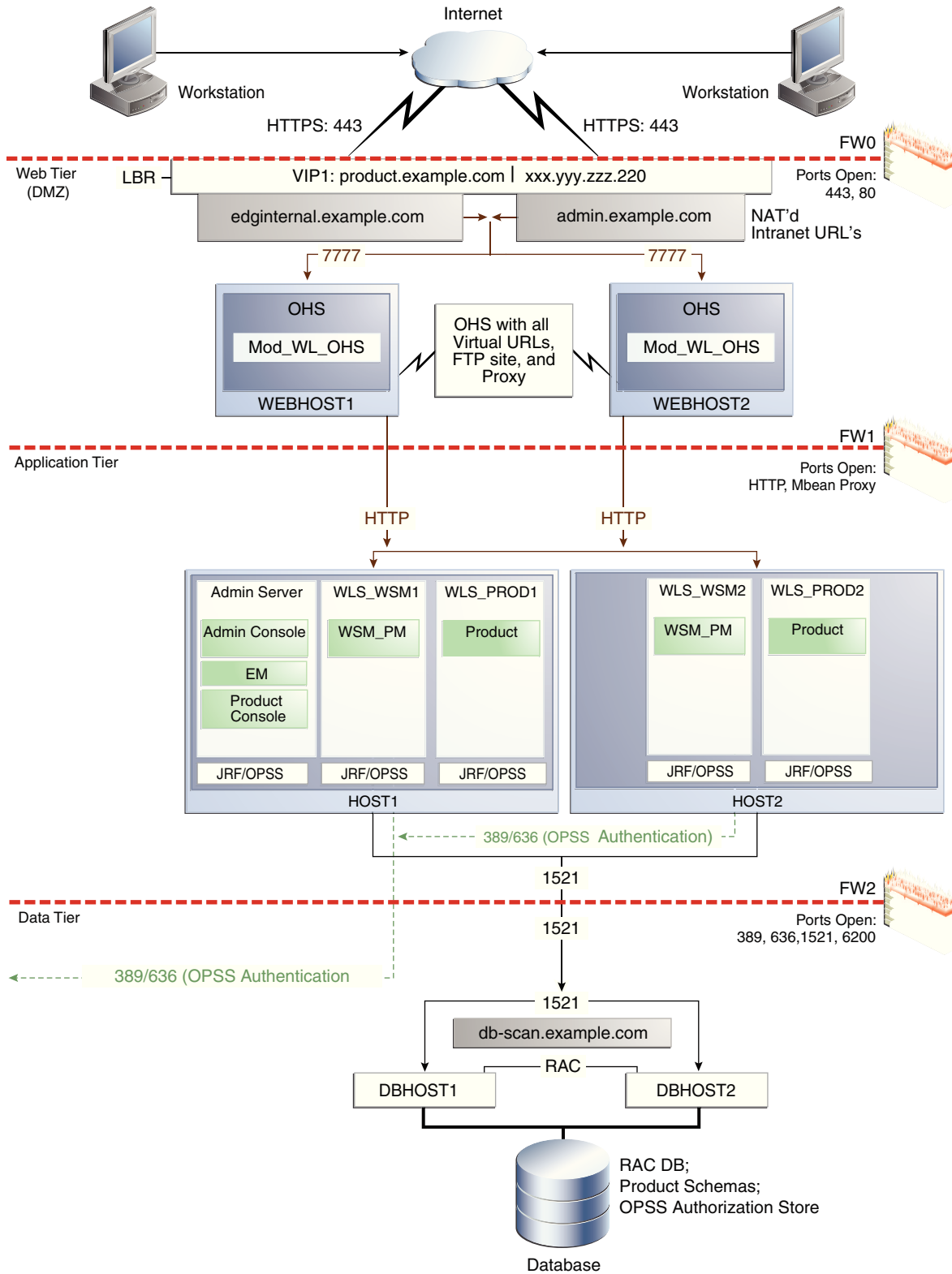
All Oracle Fusion Middleware enterprise deployments are designed to demonstrate the best practices for installing and configuring an Oracle Fusion Middleware production environment.

A best practices approach starts with the basic concept of a multi-tiered deployment and standard communications between the different software tiers.

[Figure 2-1](#) shows a typical enterprise deployment, including the Web tier, application tier and data tier. All enterprise deployments are based on these basic principles.

For a description of each tier and the standard protocols used for communications within a typical Oracle Fusion Middleware enterprise deployment, see [Understanding the Typical Enterprise Deployment Topology Diagram](#).

Figure 2-1 Typical Enterprise Deployment Topology Diagram



2.2 About the Typical Enterprise Deployment Topology Diagram

A typical enterprise deployment topology consists of a Hardware Load Balancer (LBR), Web Tier, Application Tier, and Data Tier. You can obtain detailed information on these components in this section.

[Understanding the Firewalls and Zones of a Typical Enterprise Deployment](#)

[Understanding the Elements of a Typical Enterprise Deployment Topology](#)

[Receiving Requests Through Hardware Load Balancer](#)

[Understanding the Web Tier](#)

[Understanding the Application Tier](#)

[About the Data Tier](#)

2.2.1 Understanding the Firewalls and Zones of a Typical Enterprise Deployment

The topology is divided into several security zones, which are separated by firewalls:

- The Web tier (or DMZ), which is used for the hardware load balancer and Web servers (in this case, Oracle HTTP Server instances) that receive the initial requests from users. This zone is accessible only through a single virtual server name defined on the load balancer.
- The application tier, which is where the business and application logic resides.
- The data tier, which is not accessible from the Internet and reserved in this topology for the highly available database instances.

The firewalls are configured to allow data to be transferred only through specific communication ports. Those ports (or in some cases, the protocols that will need open ports in the firewall) are shown on each firewall line in the diagram.

For example:

- On the firewall protecting the Web tier, only the HTTP ports are open: 443 for HTTPS and 80 for HTTP.
- On the firewall protecting the Application tier, HTTP ports, and MBean proxy port are open.

Applications that require external HTTP access can use the Oracle HTTP Server instances as a proxy. Note that this port for outbound communications only and the proxy capabilities on the Oracle HTTP Server must be enabled.

- On the firewall protecting the data tier, the database listener port (typically, 1521) must be open.

The LDAP ports (typically, 389 and 636) are also required to be open for communication between the authorization provider and the LDAP-based identity store.

The ONS port (typically, 6200) is also required so the application tier can receive notifications about workload and events in the Oracle RAC Database. These events are used by the Oracle WebLogic Server connection pools to adjust quickly (creating or destroying connections), depending on the availability and workload on the Oracle RAC database instances.

For a complete list of the ports you must open for a specific Oracle Fusion Middleware enterprise deployment topology, see the chapter that describes the topology you want to implement, or refer to the *Enterprise Deployment Workbook* for the topology you are implement. For more information, see [Using the Enterprise Deployment Workbook](#) .

2.2.2 Understanding the Elements of a Typical Enterprise Deployment Topology

The enterprise deployment topology consists of the following high-level elements:

- A hardware load balancer that routes requests from the Internet to the Web servers in the Web tier. It also routes requests from internal clients or other components that are performing internal invocations within the corporate network.
- A Web tier, consisting of a hardware load balancer and two or more physical computers that host the Web server instances (for high availability).

The Web server instances are configured to authenticate users (via an external identity store and a single sign-on server) and then route the HTTP requests to the Oracle Fusion Middleware products and components running in the Application tier.

The Web server instances also host static Web content that does not require application logic to be delivered. Placing such content in the Web tier reduces the overhead on the application servers and eliminates unnecessary network activity.

- An Application tier, consisting of two or more physical computers that are hosting a cluster of Oracle WebLogic Server Managed Servers, and the Administration Server for the domain. The Managed Servers are configured to run the various Oracle Fusion Middleware products, such as Oracle SOA Suite, Oracle Service Bus, Oracle WebCenter Content, and Oracle WebCenter Portal, depending on your choice of products in the enterprise deployment.
- A data tier, consisting of two or more physical hosts that are hosting an Oracle RAC Database.

2.2.3 Receiving Requests Through Hardware Load Balancer

The following topics describe the hardware load balancer and its role in an enterprise deployment.

[Purpose of the Hardware Load Balancer \(LBR\)](#)

[Summary of the Typical Load Balancer Virtual Server Names](#)

[HTTPS versus HTTP Requests to the External Virtual Server Name](#)

2.2.3.1 Purpose of the Hardware Load Balancer (LBR)

The following topics describe the types of requests handled by the hardware load balancer in an enterprise deployment.

[HTTP Requests from the Internet to the Web server instances in the Web tier](#)

[Specific internal-only communications between the components of the Application tier](#)

2.2.3.1.1 HTTP Requests from the Internet to the Web server instances in the Web tier

The hardware load balancer balances the load on the Web tier by receiving requests to a single virtual host name and then routing each request to one of the Web server

instances, based on a load balancing algorithm. In this way, the load balancer ensures that no one Web server is overloaded with HTTP requests.

For more information about the purpose of specific virtual host names on the hardware load balancer, see [Summary of the Typical Load Balancer Virtual Server Names](#).

Note that in the reference topology, only HTTP requests are routed from the hardware load balancer to the Web tier. Secure Socket Layer (SSL) requests are terminated at the load balancer and only HTTP requests are forwarded to the Oracle HTTP Server instances. This guide does not provide instructions for SSL configuration between the load balancer and the Oracle HTTP Server instances or between the Web tier and the Application tier.

The load balancer provides high availability by ensuring that if one Web server goes down, requests will be routed to the remaining Web servers that are up and running.

Further, in a typical highly available configuration, the hardware load balancers are configured such that a hot standby device is ready to resume service in case a failure occurs in the main load balancing appliance. This is important because for many types of services and systems, the hardware load balancer becomes the unique point of access to make invocations and, as a result, becomes a single point of failure (SPOF) for the whole system if it is not protected.

2.2.3.1.2 Specific internal-only communications between the components of the Application tier

In addition, the hardware load balancer routes specific communications between the Oracle Fusion Middleware components and applications on the application tier. The internal-only requests are also routed through the load balancer, using a unique virtual host name.

2.2.3.2 Summary of the Typical Load Balancer Virtual Server Names

In order to balance the load on servers and to provide high availability, the hardware load balancer is configured to recognize a set of virtual server names. As shown in the diagram, the following virtual server names are recognized by the hardware load balancer in this topology:

- `wcc.example.com` - This virtual server name is used for all incoming traffic.

Users enter this URL to access the Oracle Fusion Middleware product you have deployed and the custom applications available on this server. The load balancer then routes these requests (using a load balancing algorithm) to one of the servers in the Web tier. In this way, the single virtual server name can be used to route traffic to multiple servers for load balancing and high availability of the Web servers instances.

- `wccinternal.example.com` - This virtual server name is for internal communications only.

The load balancer uses its **Network Address Translation (NAT)** capabilities to route any internal communication from the Application tier components that are directed to this URL. This URL is not exposed to external customers or users on the Internet. Each product has specific uses for the internal URL, so in the deployment instructions, we prefix it with the product name.

- `admin.example.com` - This virtual server name is for administrators who need to access the Oracle Enterprise Manager Fusion Middleware Control and Oracle WebLogic Server Administration Console interfaces.

This URL is known only to internal administrators. It also uses the NAT capabilities of the load balancer to route administrators to the active Administration Server in the domain.

For the complete set of virtual server names you must define for your topology, see the chapter that describes the product-specific topology.

2.2.3.3 HTTPS versus HTTP Requests to the External Virtual Server Name

Note that when you configure the hardware load balancer, a best practice is to assign the main external URL (for example, `http://myapplication.example.com`) to port 80 and port 443.

Any request on port 80 (non-SSL protocol) should be redirected to port 443 (SSL protocol). Exceptions to this rule include requests from public WSDLs. For more information, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

2.2.4 Understanding the Web Tier

The Web tier of the reference topology consists of the Web servers that receive requests from the load balancer. In the typical enterprise deployment, at least two Oracle HTTP Server instances are configured in the Web tier. The following topics provide more detail.

[Benefits of Using Oracle HTTP Server Instances to Route Requests](#)

[Configuration of Oracle HTTP Server in the Web Tier](#)

[About Mod_WL_OHS](#)

2.2.4.1 Benefits of Using Oracle HTTP Server Instances to Route Requests

A Web tier with Oracle HTTP Server is not a requirement for many of the Oracle Fusion Middleware products. You can route traffic directly from the hardware load balancer to the WLS servers in the Application Tier. However, a Web tier does provide several advantages, which is why it is recommended as part of the reference topology:

- The Web tier provides DMZ public zone, which is a common requirement in security audits. If a load balancer routes directly to the WebLogic Server, requests move from the load balancer to the application tier in one single HTTP jump, which can cause security concerns.
- The Web tier allows the WebLogic Server cluster membership to be reconfigured (new servers added, others removed) without having to change the Web server configuration (as long as at least some of the servers in the configured list remain alive).
- Oracle HTTP Server delivers static content more efficiently and faster than WebLogic Server; it also provides FTP services, which are required for some enterprise deployments, as well as the ability to create virtual hosts and proxies via the Oracle HTTP Server configuration files.
- Oracle HTTP Server provides HTTP redirection over and above what WebLogic Server provides. You can use Oracle HTTP Server as a front end against many different WebLogic Server clusters, and in some cases, control the routing via content based routing.
- Oracle HTTP Server provides the ability to integrate single sign-on capabilities into your enterprise deployment. For example, you can later implement single sign-on

for the enterprise deployment, using Oracle Access Manager, which is part of the Oracle Identity and Access Management family of products.

- Oracle HTTP Server provides support for WebSocket connections deployed within WebLogic Server.

For more information about Oracle HTTP Server, see *Introduction to Oracle HTTP Server* in *Oracle Fusion Middleware Administering Oracle HTTP Server*.

2.2.4.2 Configuration of Oracle HTTP Server in the Web Tier

Starting with Oracle Fusion Middleware 12c, the Oracle HTTP Server software can be configured in one of two ways: as part of an existing Oracle WebLogic Server domain or in its own standalone domain. Each configuration offers specific benefits.

When you configure Oracle HTTP Server instances as part of an existing WebLogic Server domain, you can manage the Oracle HTTP Server instances, including the wiring of communications between the Web servers and the Oracle WebLogic Server Managed Servers using Oracle Enterprise Manager Fusion Middleware Control. When you configure Oracle HTTP Server in a standalone configuration, you can configure and manage the Oracle HTTP Server instances independently of the application tier domains.

For this enterprise deployment guide, the Oracle HTTP Server instances are configured as separate standalone domains, one on each Web tier host. You can choose to configure the Oracle HTTP Server instances as part of the application tier domain, but this enterprise deployment guide does not provide specific steps to configure the Oracle HTTP Server instances in that manner.

For more information, see *About Oracle HTTP Server* in *Oracle Fusion Middleware Installing and Configuring Oracle HTTP Server*.

2.2.4.3 About Mod_WL_OHS

As shown in the diagram, the Oracle HTTP Server instances use the WebLogic Proxy Plug-In (`mod_wl_ohs`) for proxying HTTP requests from Oracle HTTP Server to the Oracle WebLogic Server Managed Servers in the Application tier.

For more information, see *What are Oracle WebLogic Server Proxy Plug-Ins?* in *Oracle Fusion Middleware Using Oracle WebLogic Server Proxy Plug-Ins 12.2.1.1*.

2.2.5 Understanding the Application Tier

The application tier consists of two physical host computers, where Oracle WebLogic Server and the Oracle Fusion Middleware products are installed and configured. The application tier computers reside in the secured zone between firewall 1 and firewall 2.

The following topics provide more information.

[Configuration of the Administration Server and Managed Servers Domain Directories](#)

[About the Node Manager Configuration in a Typical Enterprise Deployment](#)

[About Using Unicast for Communications within the Application Tier](#)

[Understanding OPSS and Requests to the Authentication and Authorization Stores](#)

2.2.5.1 Configuration of the Administration Server and Managed Servers Domain Directories

Unlike the Managed Servers in the domain, the Administration Server uses an active-passive high availability configuration. This is because only one Administration Server can be running within an Oracle WebLogic Server domain.

In the topology diagrams, the Administration Server on HOST1 is in the active state and the Administration Server on HOST2 is in the passive (inactive) state.

To support the manual fail over of the Administration Server in the event of a system failure, the typical enterprise deployment topology includes:

- A Virtual IP Address (VIP) for the routing of Administration Server requests
- The configuration of the Administration Server domain directory on a shared storage device.

In the event of a system failure (for example a failure of HOST1), you can manually reassign the Administration Server VIP address to another host in the domain, mount the Administration Server domain directory on the new host, and then start the Administration Server on the new host.

However, unlike the Administration Server, there is no benefit to storing the Managed Servers on shared storage. In fact, there is a potential performance impact when Managed Server configuration data is not stored on the local disk of the host computer.

As a result, in the typical enterprise deployment, after you configure the Administration Server domain on shared storage, a copy of the domain configuration is placed on the local storage device of each host computer, and the Managed Servers are started from this copy of the domain configuration. You create this copy using the Oracle WebLogic Server pack and unpack utilities.

The resulting configuration consists of separate domain directories on each host: one for the Administration Server (on shared storage) and one for the Managed Servers (on local storage). Depending upon the action required, you must perform configuration tasks from one domain directory or the other.

For more information about structure of the Administration Server domain directory and the Managed Server domain directory, as well as the variables used to reference these directories, see [Understanding the Recommended Directory Structure for an Enterprise Deployment](#).

There is an additional benefit to the multiple domain directory model. It allows you to isolate the Administration Server from the Managed Servers. By default, the primary enterprise deployment topology assumes the Administration Server domain directory is on one of the Application Tier hosts, but if necessary, you could isolate the Administration Server further by running it from its own host, for example in cases where the Administration Server is consuming high CPU or RAM. Some administrators prefer to configure the Administration Server on a separate, dedicated host, and the multiple domain directory model makes that possible.

2.2.5.2 About the Node Manager Configuration in a Typical Enterprise Deployment

Starting with Oracle Fusion Middleware 12c, you can use either a per domain Node Manager or a per host Node Manager. The following sections of this topic provide more information on the impact of the Node Manager configuration on a typical enterprise deployment.

Note:

For general information about these two types of Node Managers, see *Overview* in *Oracle Fusion Middleware Administering Node Manager for Oracle WebLogic Server*.

About Using a Per Domain Node Manager Configuration

In a per domain Node Manager configuration—as opposed to a per host Node Manager configuration—you actually start two Node Manager instances on the Administration Server host: one from the Administration Server domain directory and one from the Managed Servers domain directory. In addition, a separate Node Manager instance runs on each of the other hosts in the topology.

The Node Manager controlling the Administration Server uses the listen address of the virtual host name created for the Administration Server. The Node Manager controlling the Managed Servers uses the listen address of the physical host. When the Administration Server fails over to another host, an additional instance of Node Manager is started to control the Administration Server on the failover host.

The key advantages of the per domain configuration are an easier and simpler initial setup of the Node Manager and the ability to set Node Manager properties that are unique to the Administration Server. This last feature was important in previous releases because some features, such as Crash Recovery, applied only to the Administration Server and not to the Managed servers. In the current release, the Oracle SOA Suite products can be configured for Automated Service Migration, rather than Whole Server Migration. This means the Managed Servers, as well as the Administration Server, can take advantage of Crash Recovery, so there is no need to apply different properties to the Administration Server and Managed Server domain directories.

Another advantage is that the per domain Node Manager provides a default SSL configuration for Node Manager-to-Server communication, based on the Demo Identity store created for each domain.

About Using a Per Host Domain Manager Configuration

In a per-host Node Manager configuration, you start a single Node Manager instance to control the Administration Server and all Managed Servers on a host, even those that reside in different domains. This reduces the footprint and resource utilization on the Administration Server host, especially in those cases where multiple domains coexist on the same machine.

A per-host Node Manager configuration allows all Node Managers to use a listen address of ANY, so they listen on all addresses available on the host. This means that when the Administration Server fails over to a new host, no additional configuration is necessary. The per host configuration allows for simpler maintenance, because you can update and maintain a single Node Manager properties file on each host, rather than multiple node manager property files.

The per-host Node Manager configuration requires additional configuration steps. If you want SSL for Node Manager-to-Server communication, then you must configure an additional Identity and Trust store, and it also requires using Subject Alternate Names (SAN), because the Node Manager listens on multiple addresses. Note that SSL communications are typically not required for the application tier, because it is protected by two firewalls.

2.2.5.3 About Using Unicast for Communications within the Application Tier

Oracle recommends the unicast communication protocol for communication between the Managed Servers and hosts within the Oracle WebLogic Server clusters in an enterprise deployment. Unlike multicast communication, unicast does not require cross-network configuration and it reduces potential network errors that can occur from multicast address conflicts as well.

When you consider using the multicast or unicast protocol for your own deployment, consider the type of network, the number of members in the cluster, and the reliability requirements for cluster membership. Also consider the following benefits of each protocol.

Benefits of unicast in an enterprise deployment:

- Uses a group leader that every server sends messages directly to. This leader is responsible for retransmitting the message to every other group member and other group leaders, if applicable.
- Works out of the box in most network topologies
- Requires no additional configuration, regardless of the network topology.
- Uses a single missed heartbeat to remove a server from the cluster membership list.

Benefits of multicast in an enterprise deployment:

- Multicast uses a more scalable peer-to-peer model where a server sends each message directly to the network once and the network makes sure that each cluster member receives the message directly from the network.
- Works out of the box in most modern environments where the cluster members are in a single subnet.
- Requires additional configuration in the router(s) and WebLogic Server (that is., Multicast TTL) if the cluster members span more than one subnet.
- Uses three consecutive missed heartbeats to remove a server from the cluster membership list.

Depending on the number of servers in your cluster and on whether the cluster membership is critical for the underlying application (for example in session-replication intensive applications or clusters with intensive RMI invocations across the cluster), each model may behave better.

Consider whether your topology is going to be part of an Active-Active disaster recovery system or if the cluster is going to traverse multiple subnets. In general, unicast will behave better in those cases.

For more information see the following resources:

- *Configuring Multicast Messaging for WebLogic Server Clusters in Oracle Fusion Middleware High Availability Guide*
- *One-to-Many Communication Using Unicast in Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*

2.2.5.4 Understanding OPSS and Requests to the Authentication and Authorization Stores

Many of the Oracle Fusion Middleware products and components require an Oracle Platform Security Services (OPSS) security store for authentication providers (an identity store), policies, credentials, keystores, and for audit data. As a result, communications must be enabled so the Application tier can send requests to and from the security providers.

For authentication, this communication is to an LDAP directory, such as Oracle Internet Directory (OID) or Oracle Unified Directory (OUD), which typically communicates over port 389 or 636. When you configure an Oracle Fusion Middleware domain, the domain is configured by default to use the WebLogic Server Authentication provider. However, for an enterprise deployment, you must use a dedicated, centralized LDAP-compliant authentication provider.

For authorization (and the policy store), the location of the security store varies, depending upon the tier:

- For the application tier, the authorization store is database-based, so frequent connections from the Oracle WebLogic Server Managed Servers to the database are required for the purpose of retrieving the required OPSS data.
- For the Web tier, the authorization store is file-based, so connections to the database are not required.

For more information about OPSS security stores, see the following sections of *Oracle Fusion Middleware Securing Applications with Oracle Platform Security Services*:

- Authentication Basics
- The Security Model

2.2.6 About the Data Tier

In the Data tier, an Oracle RAC database runs on the two hosts (DBHOST1 and DBHOST2). The database contains the schemas required by the Oracle WebCenter Content components and the Oracle Platform Security Services (OPSS) policy store.

You can define multiple services for the different products and components in an enterprise deployment to isolate and prioritize throughput and performance accordingly. In this guide, one database service is used as an example. Furthermore, you can use other high availability database solutions to protect the database:

- Oracle Data Guard; for more information, see the Introduction to Oracle Data Guard in *Oracle Data Guard Concepts and Administration*.
- Oracle RAC One Node; for more information, see Overview of Oracle RAC One Node in *Oracle Real Application Clusters Administration and Deployment Guide*.

These solutions above provide protection for the database beyond the information provided in this guide, which focuses on using an Oracle RAC Database, given the scalability and availability requirements that typically apply to an enterprise deployment.

For more information about using Oracle Databases in a high availability environment, see Database Considerations in *Oracle Fusion Middleware High Availability Guide*.

Understanding the WebCenter Content Enterprise Deployment Topology

The Oracle WebCenter Content enterprise deployment topology represents a specific reference implementation of the concepts described in [Understanding a Typical Enterprise Deployment](#).

[Diagram of the WebCenter Content Enterprise Topology](#)

The below diagram shows the primary Oracle WebCenter Content enterprise deployment topologies.

[Understanding the WebCenter Content Enterprise Topology Diagram](#)

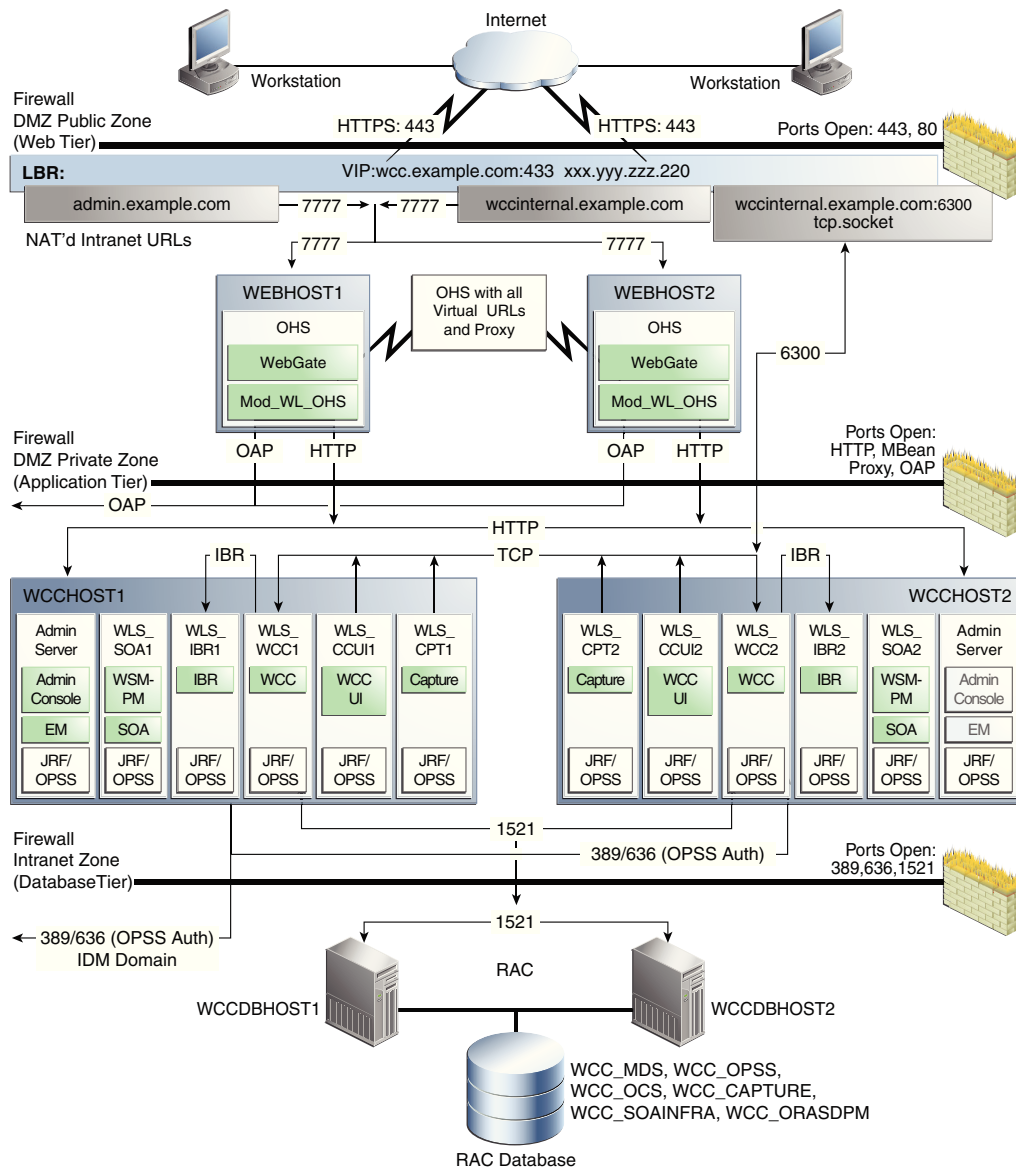
Although most of the elements of Oracle WebCenter Content topology represent standard features of any enterprise topology, there are some elements that are unique to the WebCenter Content topology.

[Flow Chart and Roadmap for Implementing the WebCenter Content Enterprise Topology](#)

It is essential to understand the steps that you need to perform to install and configure the WebCenter Content enterprise topology.

3.1 Diagram of the WebCenter Content Enterprise Topology

The below diagram shows the primary Oracle WebCenter Content enterprise deployment topologies.



3.2 Understanding the WebCenter Content Enterprise Topology Diagram

Although most of the elements of Oracle WebCenter Content topology represent standard features of any enterprise topology, there are some elements that are unique to the WebCenter Content topology.

Most of the elements of Oracle WebCenter Content topologies represent standard features of any enterprise topology that follows the Oracle-recommended best practices. These elements are described detail in [Understanding a Typical Enterprise Deployment](#).

Before you review the information in the following topics, it is assumed you have reviewed the information in [Understanding a Typical Enterprise Deployment](#) and that you are familiar with the general concepts of an enterprise deployment topology.

[Summary of Oracle WebCenter Content Load Balancer Virtual Server Names](#)

[Summary of the Managed Servers and Clusters on the WebCenter Content Application Tier](#)

3.2.1 Summary of Oracle WebCenter Content Load Balancer Virtual Server Names

In order to balance the load on servers and to provide high availability, the hardware load balancer is configured to recognize a set of virtual server names.

For information about the purpose of each of these server names, see [Summary of the Typical Load Balancer Virtual Server Names](#).

The following virtual server names are recognized by the hardware load balancer in Oracle WebCenter Content topologies:

- `wcc.example.com` - This virtual server name is used for all incoming traffic. It acts as the access point for all HTTP traffic to the runtime Oracle WebCenter Content components. The load balancer routes all requests to this virtual server name over SSL. As a result, clients access this service using the following secure address:

```
wcc.example.com:443
```

- `wccinternal.example.com` - This virtual server name is for internal communications between the application tier components only and is not exposed to the Internet.

The traffic from clients to this URL is not SSL-enabled. Clients access this service using the following address and the requests are forwarded to port 7777 on WEBHOST1 and WEBHOST2:

```
wccinternal.example.com:80
```

Note that this URL can also be set as the URL to be used for internal service invocations while modeling composites or at runtime with the appropriate Enterprise Manager MBeans.

This virtual server name also acts as the access point for all internal Remote Intradoc Client (RIDC) TCP traffic to the runtime Oracle WebCenter Content components. Applications like Imaging and Capture access this service using the address `ucminternal.example.com:6300` for RIDC connections, and the requests are forwarded to port 4444 on WCCHOST1 and WCCHOST2.

- `admin.example.com` - This virtual server name is for administrators who need to access the Oracle Enterprise Manager Fusion Middleware Control and Oracle WebLogic Server Administration Console interfaces.

Information later in this guide provide instructions so you can:

- Configure the hardware load balancer to recognize and route requests to the virtual host names
- Configure the Oracle HTTP Server instances on the Web Tier to recognize and properly route requests to these virtual host names to the correct host computers.

3.2.2 Summary of the Managed Servers and Clusters on the WebCenter Content Application Tier

The Application tier hosts the Administration Server and Managed Servers in the Oracle WebLogic Server domain.

Depending upon the topology you select, the Oracle WebLogic Server domain for the Oracle WebCenter Content domain consists of the clusters shown in [Table 3-1](#). These clusters function as active-active high availability configurations.

Table 3-1 Summary of the Clusters in the Oracle WebCenter Content Enterprise Deployment Topology

Cluster	Managed Servers
Oracle WebCenter Content Cluster	WLS_WCC1, WLS_WCC2
Oracle SOA Suite Cluster	WLS_SOA1, WLS_SOA2
Oracle Inbound Refinery Cluster	WLS_IBR1, WLS_IBR2
Oracle WebCenter Enterprise Capture Cluster	WLS_CPT1, WLS_CPT2
WebCenter Content user interface Cluster	WLS_WCCUI1, WLS_WCCUI2

3.3 Flow Chart and Roadmap for Implementing the WebCenter Content Enterprise Topology

It is essential to understand the steps that you need to perform to install and configure the WebCenter Content enterprise topology.

[Flow Chart of the Steps to Install and Configure the WebCenter Content Enterprise Topology](#)

[Roadmap Table for Planning and Preparing for an Enterprise Deployment](#)

[Roadmap Table for Configuring the Oracle WebCenter Content Topology](#)

3.3.1 Flow Chart of the Steps to Install and Configure the WebCenter Content Enterprise Topology

[Figure 3-1](#) shows a flow chart of the steps required to install and configure the primary enterprise deployment topologies described in this chapter. The sections following the flow chart explain each step in the flow chart.

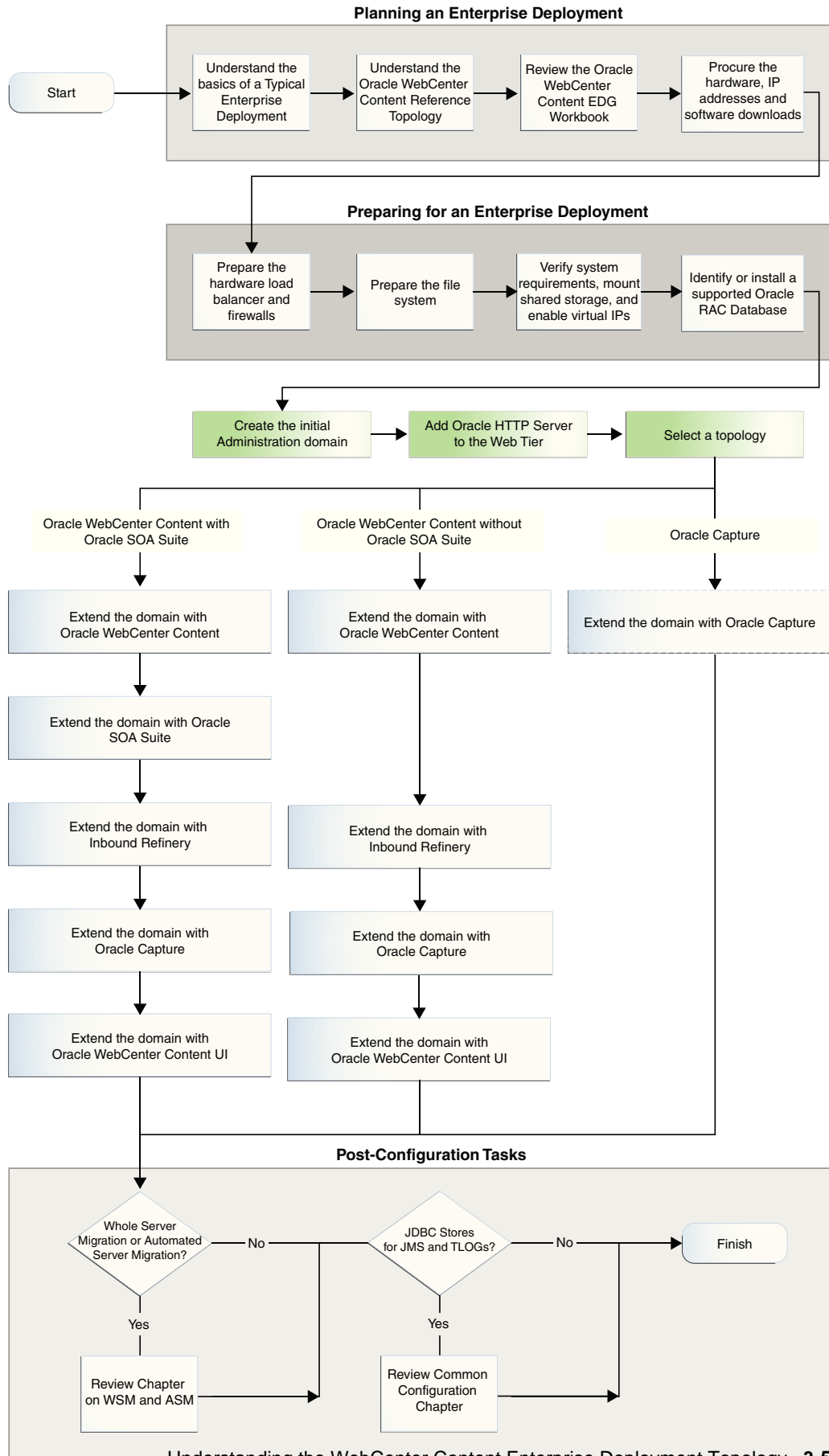
This guide is designed so you can start with a working WebCenter Content domain and then later extend the domain to add additional capabilities.

This modular approach to building the topology allows you to make strategic decisions, based on your hardware and software resources, as well as the Oracle WebCenter Content features that are most important to your organization.

It also allows you to validate and troubleshoot each individual product or component as they are configured.

This does not imply that configuring multiple products in one Configuration Wizard session is not supported; it is possible to group various extensions like the ones presented in this guide in one Configuration Wizard execution. However, the instructions in this guide focus primarily on the modular approach to building an enterprise deployment.

Figure 3-1 Flow Chart of the Enterprise Topology Configuration Steps



3.3.2 Roadmap Table for Planning and Preparing for an Enterprise Deployment

The following table describes each of the planning and preparing steps shown in the enterprise topology flow chart.

Flow Chart Step	More Information
Understand the basics of a Typical Enterprise Deployment	Understanding a Typical Enterprise Deployment
Understand the specific reference topology for the products you plan to deploy.	Review the product-specific topologies and the description of the topologies, including the virtual servers required and the summary of clusters and Managed Servers recommended for the product-specific deployment.
Review the Oracle WebCenter Content EDG Workbook	Using the Enterprise Deployment Workbook
Procure the hardware, IP addresses and software downloads	Procuring Resources for an Enterprise Deployment
Prepare the hardware load balancer and firewalls	Preparing the Load Balancer and Firewalls for an Enterprise Deployment
Prepare the file system	Preparing the File System for an Enterprise Deployment
Verify system requirements, mount shared storage, and enable virtual IPs	Preparing the Host Computers for an Enterprise Deployment
Identify or install a supported Oracle RAC Database	Preparing the Database for an Enterprise Deployment

3.3.3 Roadmap Table for Configuring the Oracle WebCenter Content Topology

The following table describes each of the configuration steps required when configuring the topology shown in [Diagram of the WebCenter Content Enterprise Deployment Topology](#).

These steps correspond to the steps shown in the flow chart.

Flow Chart Step	More Information
Create the initial Infrastructure domain	Creating the Initial Infrastructure Domain for an Enterprise Deployment
Extend the domain to Include the Web Tier	Configuring the Web Tier for an Enterprise Deployment
Extend the domain with Oracle WebCenter Content	Extending the Domain to Include Oracle WebCenter Content
Extend the domain with Oracle SOA Suite	Extending the Domain with Oracle SOA Suite
Extend the domain with Inbound Refinery	Extending the Domain to Include Inbound Refinery
Extend the domain with Oracle WebCenter Enterprise Capture	Extending the Domain to Include Capture
Extend the domain with WebCenter Content user interface	Extending the Domain to Include WebCenter Content User Interface
Integrate the Enterprise Deployment with Oracle Identity Management	Configuring Single Sign-On for an Enterprise Deployment

Part II

Preparing for an Enterprise Deployment

It is important to understand the tasks that need to be performed to prepare for an enterprise deployment.

This part of the enterprise deployment guide contains the following topics.

[Using the Enterprise Deployment Workbook](#)

The Enterprise Deployment Workbook enables you to plan an enterprise deployment for your organization.

[Procuring Resources for an Enterprise Deployment](#)

[Preparing the Load Balancer and Firewalls for an Enterprise Deployment](#)

[Preparing the File System for an Enterprise Deployment](#)

[Preparing the Host Computers for an Enterprise Deployment](#)

It is important to perform a set of tasks on each computer or server before configuring the enterprise deployment topology. This involves verifying the minimum hardware and operating system requirements for each host, configuring operating system users and groups, enabling Unicode support, mounting the required shared storage systems to the host and enabling the required virtual IP addresses on each host.

[Preparing the Database for an Enterprise Deployment](#)

Using the Enterprise Deployment Workbook

The Enterprise Deployment Workbook enables you to plan an enterprise deployment for your organization.

This chapter provides an introduction to the Enterprise Deployment workbook, use cases and information on who should use the Enterprise Deployment workbook.

[Introduction to the Enterprise Deployment Workbook](#)

The Enterprise Deployment Workbook is a spreadsheet that can be used by architects, system engineers, database administrators, and others to plan and record all the details for an environment installation.

[Typical Use Case for Using the Workbook](#)

It is important to understand the roles and tasks involved in a typical use case of the enterprise deployment workbook.

[Using the Oracle WebCenter Content Enterprise Deployment Workbook](#)

Locating and understanding the Oracle WebCenter Content Enterprise Deployment Workbook enables you to use it efficiently.

[Who Should Use the Enterprise Deployment Workbook?](#)

The details of the Enterprise Deployment Workbook are filled in by the individual or team responsible for planning, procuring, or setting up each category of resources.

4.1 Introduction to the Enterprise Deployment Workbook

The Enterprise Deployment Workbook is a spreadsheet that can be used by architects, system engineers, database administrators, and others to plan and record all the details for an environment installation.

The Oracle Fusion Middleware Enterprise Deployment Workbook is a companion document to this guide. It is a spreadsheet that can be used by architects, system engineers, database administrators, and others to plan and record all the details for an environment installation (such as server names, URLs, port numbers, installation paths, and other resources).

The Enterprise Deployment Workbook serves as a single document you can use to track input variables for the entire process, allowing for:

- Separation of tasks between architects, system engineers, database administrators, and other key organizational roles
- Comprehensive planning before the implementation
- Validation of planned decisions before actual implementation
- Consistency during implementation
- A record of the environment for future use

4.2 Typical Use Case for Using the Workbook

It is important to understand the roles and tasks involved in a typical use case of the enterprise deployment workbook.

A typical use case for the Enterprise Deployment Workbook involves the following roles and tasks, in preparation for an Oracle Fusion Middleware enterprise deployment:

- Architects read through the first five chapters of this guide, and fill in the corresponding sections of the Workbook
- The Workbook is validated by other architects and system engineers
- The architect uses the validated workbook to initiate network and system change requests with system engineering departments
- The Administrators and System Integrators who are installing and configuring the software refer to the workbook and the subsequent chapters of this guide to perform the installation and configuration tasks

4.3 Using the Oracle WebCenter Content Enterprise Deployment Workbook

Locating and understanding the Oracle WebCenter Content Enterprise Deployment Workbook enables you to use it efficiently.

The following sections provide an introduction to the location and contents of the Oracle WebCenter Content Enterprise Deployment Workbook:

[Locating the Oracle WebCenter Content Enterprise Deployment Workbook](#)

[Understanding the Contents of the Oracle WebCenter Content Enterprise Deployment Workbook](#)

4.3.1 Locating the Oracle WebCenter Content Enterprise Deployment Workbook

The Oracle WebCenter Content Enterprise Deployment Workbook is available as a Microsoft Excel Spreadsheet in the Oracle Fusion Middleware documentation library. It is available as a link on the Install, Patch, and Upgrade page of the library.

4.3.2 Understanding the Contents of the Oracle WebCenter Content Enterprise Deployment Workbook

The following sections describe the contents of the Oracle WebCenter Content Enterprise Deployment Workbook. The workbook is divided into tabs, each containing a set of related variables and values you will need to install and configure the Enterprise Deployment topologies.

[Using the Start Tab](#)

[Using the Hardware - Host Computers Tab](#)

[Using the Network - Virtual Hosts & Ports Tab](#)

[Using the Storage - Directory Variables Tab](#)

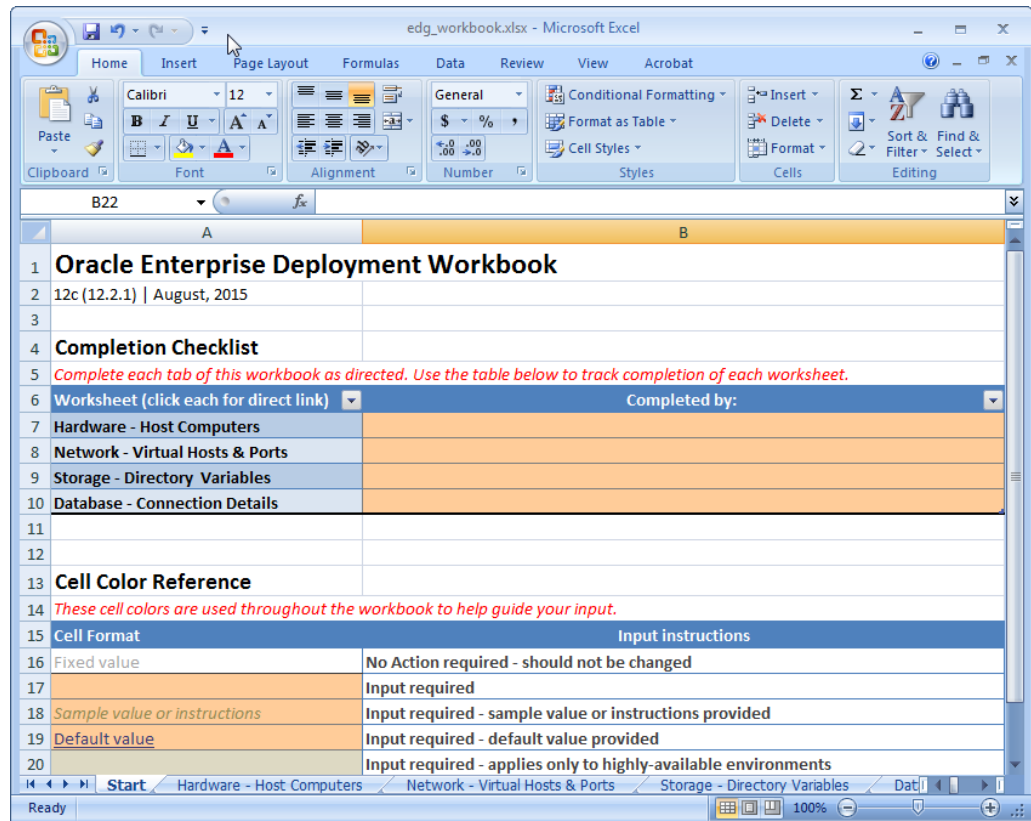
[Using the Database - Connection Details Tab](#)

4.3.2.1 Using the Start Tab

The Start tab of the Enterprise Deployment Workbook serves as a table of contents for the rest of the workbook. You can also use it to identify the people who will be completing the spreadsheet.

The Start tab also provides a key to identify the colors used to identify workbook fields that need values, as well as those that are provided for informational purposes.

The following image shows the Start tab of the spreadsheet.



4.3.2.2 Using the Hardware - Host Computers Tab

The Hardware - Host Computers tab lists the host computers required to install and configure the Oracle WebCenter Content Enterprise Deployment Topology.

The reference topologies typically require a minimum of six host computers: two for the Web tier, two for the application tier, and two for the Oracle RAC database on the data tier. If you decide to expand the environment to include more systems, add a row for each additional host computer.

The **Abstract Host Name** is the name used throughout this guide to reference the host. For each row, procure a host computer, and enter the **Actual Host Name**. You can then use the actual host name when any of the abstract names is referenced in this guide.

For example, if a procedure in this guide references WCCHOST1, you can then replace the WCCHOST1 variable with the actual name provided on the Hardware - Host Computers tab of the workbook.

Note:

If two domains share the same node, for example, if you set up the Oracle SOA suite, and then create MFT with its own domain, you will have two domains on the same node. In this case, you will use WCCHOST1 and MFTHOST1 at the same time, one for each domain.

For easy reference, Oracle also recommends that you include the IP address, Operating System (including the version), number of CPUs, and the amount of RAM for each host. This information can be useful during the installation, configuration, and maintenance of the enterprise deployment.

For more information, see [Preparing the Host Computers for an Enterprise Deployment](#).

4.3.2.3 Using the Network - Virtual Hosts & Ports Tab

The Network - Virtual Hosts & Ports tab lists the virtual hosts that must be defined by your network administrator before you can install and configure the enterprise deployment topology.

The port numbers are important for several reasons. You must have quick reference to the port numbers so you can access the management consoles; the firewalls must also be configured to allow network traffic via specific ports.

Each virtual host, virtual IP address, and each network port serves a distinct purpose in the deployment. For more information, see [Preparing the Load Balancer and Firewalls for an Enterprise Deployment](#).

In the Network - Virtual Hosts table, review the items in the **Abstract Virtual Host or Virtual IP Name** column. These are the virtual host and virtual IP names used in the procedures in this guide. For each abstract name, enter the actual virtual host name defined by your network administrator. Whenever this guide references one of the abstract virtual host or virtual IP names, replace that value with the actual corresponding value in this table.

Similarly, in many cases, this guide assumes you are using default port numbers for the components or products you install and configure. However, in reality, you will likely have to use different port numbers. Use the Network - Port Numbers table to map the default port values to the actual values used in your specific installation.

4.3.2.4 Using the Storage - Directory Variables Tab

As part of preparing for an enterprise deployment, it is assumed you will be using a standard directory structure, which is recommended for Oracle enterprise deployments.

In addition, procedures in this book reference specific directory locations. Within the procedures, each directory is assigned a consistent variable, which you should replace with the actual location of the directory in your installation.

For each of the directory locations listed on this tab, provide the actual directory path in your installation.

In addition, for the application tier, it is recommended that many of these standard directories be created on a shared storage device. For those directories, the table also provides fields so you can enter the name of the shared storage location and the mount point used when you mounted the shared location.

For more information, see [Preparing the File System for an Enterprise Deployment](#).

4.3.2.5 Using the Database - Connection Details Tab

When you are installing and configuring the enterprise deployment topology, you will often have to make connections to a highly available Oracle Real Application Clusters (RAC) database. In this guide, the procedures reference a set of variables that identify the information you will need to provide to connect to the database from tools, such as the Configuration Wizard and the Repository Creation Utility.

To be sure you have these values handy, use this tab to enter the actual values for these variables in your database installation.

For more information, see [Preparing the Database for an Enterprise Deployment](#).

4.4 Who Should Use the Enterprise Deployment Workbook?

The details of the Enterprise Deployment Workbook are filled in by the individual or team responsible for planning, procuring, or setting up each category of resources.

The information in the Enterprise Deployment Workbook is divided into categories. Depending on the structure of your organization and roles defined for your team, you can assign specific individuals in your organization to fill in the details of the workbook. Similarly, the information in each category can be assigned to the individual or team responsible for planning, procuring, or setting up each category of resources.

For example, the workbook can be filled in, reviewed, and used by people in your organization that fill the following roles:

- Information Technology (IT) Director
- Architect
- System Administrator
- Network Engineer
- Database Administrator

Procuring Resources for an Enterprise Deployment

It is essential to procure the required hardware, software, and network settings before configuring the Oracle WebCenter Content reference topology.

This chapter provides information on reserving the required IP addresses and identifying and obtaining software downloads for an enterprise deployment.

[Hardware and Software Requirements for the Enterprise Deployment Topology](#)

It is important to understand the hardware load balancer requirements, host computer hardware requirements, and operating system requirements for the enterprise deployment topology.

[Reserving the Required IP Addresses for an Enterprise Deployment](#)

You have to obtain and reserve a set of IP addresses before installing and configuring the enterprise topology. The set of IP addresses that need to be reserved are listed in this section.

[Identifying and Obtaining Software Distributions for an Enterprise Deployment](#)

Before you begin installing and configuring the enterprise topology, you must obtain the software distributions that you need to implement the topology.

5.1 Hardware and Software Requirements for the Enterprise Deployment Topology

It is important to understand the hardware load balancer requirements, host computer hardware requirements, and operating system requirements for the enterprise deployment topology.

This section includes the following sections.

[Hardware Load Balancer Requirements](#)

This section lists the desired features of the external load balancer.

[Host Computer Hardware Requirements](#)

This section provides information to help you procure host computers that are configured to support the enterprise deployment topologies.

[Operating System Requirements for the Enterprise Deployment Topology](#)

This section provides details about the operating system requirements.

5.1.1 Hardware Load Balancer Requirements

This section lists the desired features of the external load balancer.

This enterprise topology uses an external load balancer. This external load balancer should have the following features:

- Ability to load-balance traffic to a pool of real servers through a virtual host name: Clients access services using the virtual host name (instead of using actual host names). The load balancer can then load balance requests to the servers in the pool.
- Port translation configuration should be possible so that incoming requests on the virtual host name and port are directed to a different port on the backend servers.
- Monitoring of ports on the servers in the pool to determine availability of a service.
- Virtual servers and port configuration: Ability to configure virtual server names and ports on your external load balancer, and the virtual server names and ports must meet the following requirements:
 - The load balancer should allow configuration of multiple virtual servers. For each virtual server, the load balancer should allow configuration of traffic management on more than one port. For example, for Oracle HTTP Server in the web tier, the load balancer needs to be configured with a virtual server and ports for HTTP and HTTPS traffic.
 - The virtual server names must be associated with IP addresses and be part of your DNS. Clients must be able to access the external load balancer through the virtual server names.
- Ability to detect node failures and immediately stop routing traffic to the failed node.
- Fault-tolerant mode: It is highly recommended that you configure the load balancer to be in fault-tolerant mode.
- It is highly recommended that you configure the load balancer virtual server to return immediately to the calling client when the backend services to which it forwards traffic are unavailable. This is preferred over the client disconnecting on its own after a timeout based on the TCP/IP settings on the client machine.
- Sticky routing capability: Ability to maintain sticky connections to components. Examples of this include cookie-based persistence, IP-based persistence, and so on.
- The load balancer should be able to terminate SSL requests at the load balancer and forward traffic to the backend real servers using the equivalent non-SSL protocol (for example, HTTPS to HTTP).
- SSL acceleration (this feature is recommended, but not required for the enterprise topology).
- The ability to route TCP/IP requests; this is a requirement for Oracle SOA Suite for healthcare integration, which uses the Minimum Lower Layer Protocol (MLLP) over TCP.

5.1.2 Host Computer Hardware Requirements

This section provides information to help you procure host computers that are configured to support the enterprise deployment topologies.

It includes the following topics.

[General Considerations for Enterprise Deployment Host Computers](#)

This section specifies the general considerations required for the enterprise deployment host computers.

[Reviewing the Oracle Fusion Middleware System Requirements](#)

This section provides reference to the system requirements information to help you ensure that the environment meets the necessary minimum requirements.

[Typical Memory, File Descriptors, and Processes Required for an Enterprise Deployment](#)

This section specifies the typical memory, number of file descriptors, and operating system processes and tasks details required for an enterprise deployment.

[Typical Disk Space Requirements for an Enterprise Deployment](#)

This section specifies the disk space typically required for this enterprise deployment.

5.1.2.1 General Considerations for Enterprise Deployment Host Computers

This section specifies the general considerations required for the enterprise deployment host computers.

Before you start the process of configuring an Oracle Fusion Middleware enterprise deployment, you must perform the appropriate capacity planning to determine the number of nodes, CPUs, and memory requirements for each node depending on the specific system's load as well as the throughput and response requirements. These requirements will vary for each application or custom Oracle WebCenter Content system being used.

The information in this chapter provides general guidelines and information that will help you determine the host computer requirements. It does not replace the need to perform capacity planning for your specific production environment.

Note:

As you obtain and reserve the host computers in this section, note the host names and system characteristics in the Enterprise Deployment Workbook. You will use these addresses later when you enable the IP addresses on each host computer.

For more information, see [Using the Enterprise Deployment Workbook](#)

5.1.2.2 Reviewing the Oracle Fusion Middleware System Requirements

This section provides reference to the system requirements information to help you ensure that the environment meets the necessary minimum requirements.

Review the [Oracle Fusion Middleware System Requirements and Specifications](#) to ensure that your environment meets the minimum installation requirements for the products you are installing.

The Requirements and Specifications document contains information about general Oracle Fusion Middleware hardware and software requirements, minimum disk space and memory requirements, database schema requirements, and required operating system libraries and packages.

It also provides some general guidelines for estimating the memory requirements for your Oracle Fusion Middleware deployment.

5.1.2.3 Typical Memory, File Descriptors, and Processes Required for an Enterprise Deployment

This section specifies the typical memory, number of file descriptors, and operating system processes and tasks details required for an enterprise deployment.

The following table summarizes the memory, file descriptors, and processes required for the Administration Server and each of the Managed Servers computers in a typical Oracle WebCenter Content enterprise deployment. These values are provided as an example only, but they can be used to estimate the minimum amount of memory required for an initial enterprise deployment.

The example in this topic reflects the minimum requirements for configuring the Managed Servers and other services required on WCCHOST1, as depicted in the reference topologies.

When you are procuring machines, use the information in the **Approximate Top Memory** column as a guide when determining the minimum physical memory each host computer should have available.

After you procure the host computer hardware and verify the operating system requirements, review the software configuration to be sure the operating system settings are configured to accommodate the number of open files listed in the **File Descriptors** column and the number processes listed in the **Operating System Processes and Tasks** column.

For more information, see [Setting the Open File Limit and Number of Processes Settings on UNIX Systems](#).

Managed Server, Utility, or Service	Approximate Top Memory	Number of File Descriptors	Operating System Processes and Tasks
Administration Server	3.5 GB	3500	165
WLS_WCC	4.0 GB	3100	240
WLS_WCCUI	4.0 GB	3100	100
WLS_CPT	3.0 GB	1300	100
WLS_IBR	3.0 GB	1300	100
WLS_SOA	4.0 GB	3100	240
WLST (connection to the Node Manager)	1.5 GB	910	20
Configuration Wizard	1.5 GB	700	20
Node Manager	1.0 GB	720	15
TOTAL	11.5 GB*	TBD	TBD

* Approximate total, with consideration for Operating System and other additional memory requirements.

5.1.2.4 Typical Disk Space Requirements for an Enterprise Deployment

This section specifies the disk space typically required for this enterprise deployment.

For the latest disk space requirements for the Oracle Fusion Middleware 12c (12.2.1.2) products, including the Oracle WebCenter Content products, review the [Oracle Fusion Middleware System Requirements and Specifications](#).

In addition, the following table summarizes the disk space typically required for an Oracle WebCenter Content enterprise deployment.

Use this information and the information in [Preparing the File System for an Enterprise Deployment](#) to determine the disk space requirements required for your deployment.

Server	Disk
Database	nXm n = number of disks, at least 4 (striped as one disk) m = size of the disk (minimum of 30 GB)
WEBHOST _n	10 GB
WCCHOST _n	20 GB*

* For a shared storage Oracle home configuration, two installations suffice by making a total of 20 GB.

5.1.3 Operating System Requirements for the Enterprise Deployment Topology

This section provides details about the operating system requirements.

The Oracle Fusion Middleware software products and components described in this guide are certified on various operating systems and platforms, which are listed in [Oracle Fusion Middleware System Requirements and Specifications](#).

Note:

This guide focuses on the implementation of the enterprise deployment reference topology on Oracle Linux systems.

The topology can be implemented on any certified, supported operating system, but the examples in this guide typically show the commands and configuration steps as they should be performed using the bash shell on Oracle Linux.

5.2 Reserving the Required IP Addresses for an Enterprise Deployment

You have to obtain and reserve a set of IP addresses before installing and configuring the enterprise topology. The set of IP addresses that need to be reserved are listed in this section.

Before you begin installing and configuring the enterprise topology, you must obtain and reserve a set of IP addresses:

- Physical IP (IP) addresses for each of the host computers you have procured for the topology
- A virtual IP (VIP) address for the Administration Server

- Additional VIP addresses for each Managed Server that is configured for Whole Server Migration

For Fusion Middleware 12c products that support Automatic Service Migration, VIPs for the Managed Servers are typically not necessary.

- A unique virtual host name to be mapped to each VIP.

You can then work with your network administrator to be sure these required VIPs are defined in your DNS server. (Alternatively, for non-production environments, you can use the `/etc/hosts` file to define these virtual hosts).

For more information, see the following topics.

[What Is a Virtual IP \(VIP\) Address?](#)

This section defines the virtual IP address and specifies its purpose.

[Why Use Virtual Host Names and Virtual IP Addresses?](#)

For an enterprise deployment, in particular, it is important that a set of VIPs--and the virtual host names to which they are mapped--are reserved and enabled on the corporate network.

[Physical and Virtual IP Addresses Required by the Enterprise Topology](#)

This section describes the physical IP (IP) and virtual IP (VIP) addresses required for the Administration Server and each of the Managed Servers in a typical Oracle WebCenter Content enterprise deployment topology.

5.2.1 What Is a Virtual IP (VIP) Address?

This section defines the virtual IP address and specifies its purpose.

A virtual IP address is an unused IP Address that belongs to the same subnet as the host's primary IP address. It is assigned to a host manually. If a host computer fails, the virtual address can be assigned to a new host in the topology. For the purposes of this guide, we reference *virtual* IP addresses, which can be re-assigned from one host to another, and *physical* IP addresses, which are assigned permanently to hardware host computer.

5.2.2 Why Use Virtual Host Names and Virtual IP Addresses?

For an enterprise deployment, in particular, it is important that a set of VIPs--and the virtual host names to which they are mapped--are reserved and enabled on the corporate network.

Alternatively, host names can be resolved through appropriate `/etc/hosts` file propagated through the different nodes.

In the event of the failure of the host computer where the IP address is assigned, the IP address can be assigned to another host in the same subnet, so that the new host can take responsibility for running the Managed Servers assigned to it.

The reassignment of virtual IP address for the Administration Server must be performed manually, but the reassignment of virtual IP addresses for Managed Servers can be performed automatically using the Whole Server Migration feature of Oracle WebLogic Server.

Whether you should use Whole Server Migration or not depends upon the products you are deploying and whether they support Automatic Service Migration.

5.2.3 Physical and Virtual IP Addresses Required by the Enterprise Topology

This section describes the physical IP (IP) and virtual IP (VIP) addresses required for the Administration Server and each of the Managed Servers in a typical Oracle WebCenter Content enterprise deployment topology.

Before you begin to install and configure the enterprise deployment, reserve a set of host names and IP addresses that correspond to the VIPs in [Table 5-1](#).

You can assign any unique host name to the VIPs, but in this guide, we reference each VIP using the suggested host names in the table.

Note:

As you obtain and reserve the IP addresses and their corresponding virtual host names in this section, note the values of the IP addresses and host names in the Enterprise Deployment Workbook. You will use these addresses later when you enable the IP addresses on each host computer.

For more information, see [Using the Enterprise Deployment Workbook](#).

Table 5-1 Summary of the Virtual IP Addresses Required for the Enterprise Deployment

Virtual IP	VIP Maps to...	Description
VIP1	ADMINVHN	ADMINVHN is the virtual host name used as the listen address for the Administration Server and fails over with manual failover of the Administration Server. It is enabled on the node where the Administration Server process is running.

5.3 Identifying and Obtaining Software Distributions for an Enterprise Deployment

Before you begin installing and configuring the enterprise topology, you must obtain the software distributions that you need to implement the topology.

The following table lists the distributions you need to obtain.

For general information about how to obtain Oracle Fusion Middleware software, see Obtaining Product Distributions in *Oracle Fusion Middleware Planning an Installation of Oracle Fusion Middleware*.

For more specific information about locating and downloading specific Oracle Fusion Middleware products, see the *Oracle Fusion Middleware Download, Installation, and Configuration Readme Files* on OTN.

Distribution	Description
Oracle Fusion Middleware 12c (12.2.1.2.0) Infrastructure	<p>Download this distribution to install the Oracle Fusion Middleware Infrastructure, which includes Oracle WebLogic Server and Java Required Files software required for Oracle Fusion Middleware products.</p> <p>This distribution also installs the Repository Creation Utility (RCU), which in previous Oracle Fusion Middleware releases was packaged in its own distribution.</p>
Oracle HTTP Server 12c (12.2.1.2.0)	Download this distribution to install the Oracle HTTP Server software on the Web Tier.
Oracle Fusion Middleware 12c (12.2.1.2.0) WebCenter Content	Download this distribution to install the Oracle WebCenter Content.
Oracle Fusion Middleware 12c (12.2.1.2.0) SOA Suite	Download this distribution if you plan to install and configure Oracle SOA Suite as part of the Oracle WebCenter Content enterprise topology.

Preparing the Load Balancer and Firewalls for an Enterprise Deployment

It is important to understand how to configure the hardware load balancer and ports that must be opened on the firewalls for an enterprise deployment.

[Configuring Virtual Hosts on the Hardware Load Balancer](#)

The hardware load balancer configuration facilitates to recognize and route requests to several virtual servers and associated ports for different types of network traffic and monitoring.

[Configuring the Firewalls and Ports for an Enterprise Deployment](#)

As an administrator, it is important that you become familiar with the port numbers used by various Oracle Fusion Middleware products and services. This ensures that the same port number is not used by two services on the same host, and that the proper ports are open on the firewalls in the enterprise topology.

6.1 Configuring Virtual Hosts on the Hardware Load Balancer

The hardware load balancer configuration facilitates to recognize and route requests to several virtual servers and associated ports for different types of network traffic and monitoring.

The following topics explain how to configure the hardware load balancer, provide the summary of the virtual servers required, and provide additional instructions for these virtual servers:

[Overview of the Hardware Load Balancer Configuration](#)

[Typical Procedure for Configuring the Hardware Load Balancer](#)

[Summary of the Virtual Servers Required for an Enterprise Deployment](#)

[Additional Instructions for admin.example.com](#)

[Additional Instructions for wcc.example.com](#)

[Additional Instructions for wccinternal.example.com](#)

6.1.1 Overview of the Hardware Load Balancer Configuration

As shown in the topology diagrams, you must configure the hardware load balancer to recognize and route requests to several virtual servers and associated ports for different types of network traffic and monitoring.

In the context of a load-balancing device, a virtual server is a construct that allows multiple physical servers to appear as one for load-balancing purposes. It is typically

represented by an IP address and a service, and it is used to distribute incoming client requests to the servers in the server pool.

The virtual servers should be configured to direct traffic to the appropriate host computers and ports for the various services available in the enterprise deployment.

In addition, you should configure the load balancer to monitor the host computers and ports for availability so that the traffic to a particular server is stopped as soon as possible when a service is down. This ensures that incoming traffic on a given virtual host is not directed to an unavailable service in the other tiers.

Note that after you configure the load balancer, you can later configure the Web server instances in the Web tier to recognize a set of virtual hosts that use the same names as the virtual servers you defined for the load balancer. For each request coming from the hardware load balancer, the Web server can then route the request appropriately, based on the server name included in the header in the request. For more information, see [Configuring Oracle HTTP Server for Administration and Oracle Web Services Manager](#).

6.1.2 Typical Procedure for Configuring the Hardware Load Balancer

The following procedure outlines the typical steps for configuring a hardware load balancer for an enterprise deployment.

Note that the actual procedures for configuring a specific load balancer will differ, depending on the specific type of load balancer. There may also be some differences depending on the type of protocol that is being load balanced. For example, TCP virtual servers and HTTP virtual servers use different types of monitors for their pools. Refer to the vendor-supplied documentation for actual steps.

1. Create a pool of servers. This pool contains a list of servers and the ports that are included in the load-balancing definition.

For example, for load balancing between the Web hosts, create a pool of servers that would direct requests to hosts WEBHOST1 and WEBHOST2 on port 7777.

2. Create rules to determine whether or not a given host and service is available and assign it to the pool of servers described in Step 1.
3. Create the required virtual servers on the load balancer for the addresses and ports that receive requests for the applications.

For a complete list of the virtual servers required for the enterprise deployment, see [Summary of the Virtual Servers Required for an Enterprise Deployment](#).

When you define each virtual server on the load balancer, consider the following:

- a. If your load balancer supports it, specify whether or not the virtual server is available internally, externally or both. Ensure that internal addresses are only resolvable from inside the network.
- b. Configure SSL Termination, if applicable, for the virtual server.
- c. Assign the pool of servers created in Step 1 to the virtual server.

6.1.3 Summary of the Virtual Servers Required for an Enterprise Deployment

This topic provides the details of the virtual servers required for an enterprise deployment.

The following table provides a list of the virtual servers you must define on the hardware load balancer for the Oracle WebCenter Content enterprise topology:

Virtual Host	Server Pool	Protocol	SSL Termination?	External?
admin.example.com:80	WEBHOST1.example.com:7777 WEBHOST2.example.com:7777	HTTP	No	No
wcc.example.com:443	WEBHOST1.example.com:7777 WEBHOST2.example.com:7777	HTTPS	Yes	Yes
wccinternal.example.com:80	WEBHOST1.example.com:7777 WEBHOST2.example.com:7777	HTTP	No	No
wccinternal.example.com:6300	WCCHOST1.example.com:4444 WCCHOST2.example.com:4444	TCP	No	No

6.1.4 Additional Instructions for admin.example.com

This section provides the additional instructions required for the virtual server—admin.example.com.

When you configure this virtual server on the hardware load balancer:

- Enable address and port translation.
- Enable reset of connections when services or hosts are down.

6.1.5 Additional Instructions for wcc.example.com

The address wcc.example.com is a virtual server name that acts as the access point for all HTTP traffic to the runtime Oracle WebCenter Content components. Traffic to SSL is configured. Clients access this service using the address wcc.example.com:443 for HTTP. When you configure this virtual server on the hardware load balancer:

- Use port 80 and port 443. Any request that goes to port 80 (non-SSL protocol) should be redirected to port 443 (SSL protocol).
- Specify ANY as the protocol (non-HTTP protocols are required for B2B).
- Enable address and port translation.
- Enable reset of connections when services and/or nodes are down.
- Create rules to filter out access to /console and /em on this virtual server.

These context strings direct requests to Oracle WebLogic Server Administration Console and to Oracle Enterprise Manager Fusion Middleware Control and should be used only when accessing the system from admin.example.com.

6.1.6 Additional Instructions for wccinternal.example.com

The address wccinternal.example.com is a virtual server name used for internal invocations of WebCenter Content and SOA services. This URL is not exposed to the Internet and is accessible only from the intranet. The incoming traffic from clients is not SSL enabled.

This address is used for both HTTP and Remote Intradoc Client (RIDC) traffic using different ports:

- HTTP traffic is routed via ports 7777 and 80.
- RIDC traffic is routed via ports 6300 and 4400 over TCP.

HTTP traffic goes to goes to Web tier hosts pool (WEBHOST1 and WEBHOST2) pool.

The end-user RIDC traffic (such as from the WebCenter Content ADF UI) goes directly to the WebCenter Content hosts pool (WCCHOST1 and WCCHOST2). The RIDC traffic uses port 6300 on the load balancer (6300 is mainly for masking), but the traffic ultimately routes to the RIDC port (4444) on the WebCenter hosts.

For Oracle SOA Suite systems, users can set this URL while modeling composites or at runtime with the appropriate MBean through Fusion Middleware Control, as the URL to be used for invoking internal services. You can use this URL for any service callback to WebCenter Content components from Oracle SOA Suite. Clients access this service using the address `wccinternal.example.com:80`, and the requests are forwarded to port 7777 on WEBHOST1 and WEBHOST2.

When you configure this virtual server on the hardware load balancer:

- Enable address and port translation.
- Enable reset of connections when services or nodes are down.
- As with `wcc.example.com`, create rules to filter out access to `/console` and `/em` on this virtual server.

6.2 Configuring the Firewalls and Ports for an Enterprise Deployment

As an administrator, it is important that you become familiar with the port numbers used by various Oracle Fusion Middleware products and services. This ensures that the same port number is not used by two services on the same host, and that the proper ports are open on the firewalls in the enterprise topology.

The following tables lists the ports that you must open on the firewalls in the topology:

Firewall notation:

- FW1 refers to the outermost firewall.
- FW2 refers to the firewall between the web tier and the application tier.
- FW3 refers to the firewall between the application tier and the data tier.

Table 6-1 Firewall Ports Common to All Fusion Middleware Enterprise Deployments

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Browser request	FW0	80	HTTP / Load Balancer	Inbound	Timeout depends on the size and type of HTML content.

Table 6-1 (Cont.) Firewall Ports Common to All Fusion Middleware Enterprise Deployments

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Browser request	FW0	443	HTTPS / Load Balancer	Inbound	Timeout depends on the size and type of HTML content.
Browser request	FW1	80	HTTPS / Load Balancer	Outbound (for intranet clients)	Timeout depends on the size and type of HTML content.
Browser request	FW1	443	HTTPS / Load Balancer	Outbound (for intranet clients)	Timeout depends on the size and type of HTML content.
Callbacks and Outbound invocations	FW1	80	HTTPS / Load Balancer	Outbound	Timeout depends on the size and type of HTML content.
Callbacks and Outbound invocations	FW1	443	HTTPS / Load Balancer	Outbound	Timeout depends on the size and type of HTML content.
Load balancer to Oracle HTTP Server	n/a	7777	HTTP	n/a	n/a
OHS registration with Administration Server	FW1	7001	HTTP/t3	Inbound	Set the timeout to a short period (5-10 seconds).
OHS management by Administration Server	FW1	OHS Admin Port (7779)	TCP and HTTP, respectively	Outbound	Set the timeout to a short period (5-10 seconds).
Session replication within a WebLogic Server cluster	n/a	n/a	n/a	n/a	By default, this communication uses the same port as the server's listen address.

Table 6-1 (Cont.) Firewall Ports Common to All Fusion Middleware Enterprise Deployments

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Administration Console access	FW1	7001	HTTP / Administration Server and Enterprise Manager	Both	You should tune this timeout based on the type of access to the admin console (whether it is planned to use the Oracle WebLogic Server Administration Console from application tier clients or clients external to the application tier).
Database access	FW2	1521	SQL*Net	Both	Timeout depends on database content and on the type of process model used for SOA.
Coherence for deployment	n/a	8088 Range: 8000 - 8090		n/a	n/a
Oracle Unified Directory access	FW2	389 636 (SSL)	LDAP or LDAP/ssl	Inbound	You should tune the directory server's parameters based on load balancer, and not the other way around.
Oracle Notification Server (ONS)	FW2	6200	ONS	Both	Required for Gridlink. An ONS server runs on each database server.

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Oracle SOA Suite and WSM Server access	FW1	8001 Range: 8000 - 8080	HTTP / WLS_SOAn	Inbound	Timeout varies based on the type of process model used for SOA.
Oracle WebCenter Content Access	FW1	16200	HTTP / WLS_WCCn	Inbound	Browser-based access. Configurable session timeouts.
RIDC API requests	FW1	6300	TCP/WLS_WCCn	Inbound	n/a
Oracle WebCenter Enterprise Capture access	FW1	16400	HTTP / WLS_CPTn	Inbound	Browser-based access. Configurable session timeouts.
Communication between SOA_Cluster members	n/a	8001	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
Communication between WCC_Cluster members	n/a	16200	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
Communication between CPT_Cluster members	n/a	16400	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.

Preparing the File System for an Enterprise Deployment

Preparing the file system for an enterprise deployment involves understanding the requirements for local and shared storage, as well as the terminology used to reference important directories and file locations during the installation and configuration of the enterprise topology.

This chapter describes how to prepare the file system for an Oracle Fusion Middleware enterprise deployment.

[Overview of Preparing the File System for an Enterprise Deployment](#)

It is important to set up your storage in a way that makes the enterprise deployment easy to understand, configure, and manage.

[Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#)

It is recommended to implement the following guidelines regarding shared storage when installing and configuring an enterprise deployment.

[Understanding the Recommended Directory Structure for an Enterprise Deployment](#)

The diagrams in this section show the recommended directory structure for a typical Oracle Fusion Middleware enterprise deployment.

[File System and Directory Variables Used in This Guide](#)

Understanding the file system directories and the directory variables used to reference these directories is essential for installing and configuring the enterprise deployment topology.

[About Creating and Mounting the Directories for an Enterprise Deployment](#)

It is recommended to implement the following best practices when creating or mounting the top-level directories in an enterprise deployment.

[Summary of the Shared Storage Volumes in an Enterprise Deployment](#)

It is important to understand the shared volumes and their purpose in a typical Oracle Fusion Middleware enterprise deployment.

7.1 Overview of Preparing the File System for an Enterprise Deployment

It is important to set up your storage in a way that makes the enterprise deployment easy to understand, configure, and manage.

This chapter provides an overview of the process of preparing the file system for an enterprise deployment. Oracle recommends setting up your storage according to information in this chapter. The terminology defined in this chapter is used in diagrams and procedures throughout the guide.

Use this chapter as a reference to help understand the directory variables used in the installation and configuration procedures.

Other directory layouts are possible and supported, but the model adopted in this guide was designed for maximum availability, providing both the best isolation of components and symmetry in the configuration and facilitating backup and disaster recovery. The rest of the document uses this directory structure and directory terminology.

7.2 Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment

It is recommended to implement the following guidelines regarding shared storage when installing and configuring an enterprise deployment.

Before you implement the detailed recommendations in this chapter, be sure to review the recommendations and general information about using shared storage in the *High Availability Guide*.

The recommendations in this chapter are based on the concepts and guidelines described in the *High Availability Guide*.

[Table 7-1](#) lists the key sections you should review and how those concepts apply to an enterprise deployment.

Table 7-1 Shared Storage Resources in the High Availability Guide

Section in <i>High Availability Guide</i>	Importance to an Enterprise Deployment
Shared Storage Prerequisites	Describes guidelines for disk format and the requirements for hardware devices that are optimized for shared storage.
Using Shared Storage for Binary (Oracle Home) Directories	Describes your options for storing the Oracle home on a shared storage device that is available to multiple hosts. For the purposes of the enterprise deployment, Oracle recommends using redundant Oracle homes on separate storage volumes. If a separate volume is not available, a separate partition on the shared disk should be used to provide redundant Oracle homes to application tier hosts.
Using Shared Storage for Domain Configuration Files	Describes the concept of creating separate domain homes for the Administration Server and the Managed Servers in the domain. For an enterprise deployment, the Administration Server domain home location is referenced by the <code>ASERVER_HOME</code> variable.
Shared Storage Requirements for JMS Stores and JTA Logs	Provides instructions for setting the location of the transaction logs and JMS stores for an enterprise deployment.

7.3 Understanding the Recommended Directory Structure for an Enterprise Deployment

The diagrams in this section show the recommended directory structure for a typical Oracle Fusion Middleware enterprise deployment.

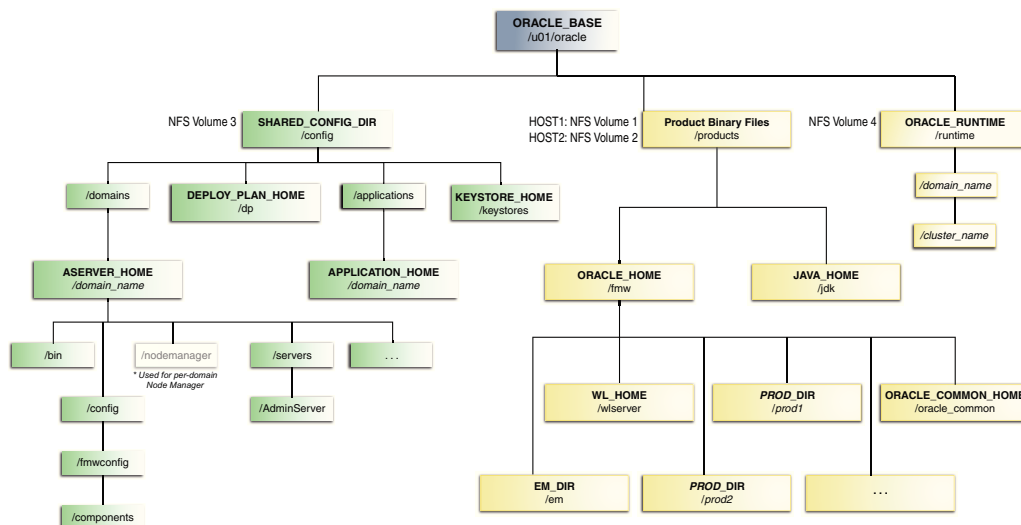
The directories shown in the diagrams contain binary files that are installed on disk by the Oracle Fusion Middleware installers, domain-specific files generated via the domain configuration process, as well as domain configuration files that are

propagated to the various host computers via the Oracle WebLogic Server pack and unpack commands:

- [Figure 7-1](#) shows the resulting directory structure on the shared storage device after you have installed and configured a typical Oracle Fusion Middleware enterprise deployment. The shared storage directories are accessible by the application tier host computers.
- [Figure 7-2](#) shows the resulting directory structure on the local storage device for a typical application tier host after you have installed and configured an Oracle Fusion Middleware enterprise deployment. The Managed Servers in particular are stored on the local storage device for the application tier host computers.
- [Figure 7-3](#) shows the resulting directory structure on the local storage device for a typical Web tier host after you have installed and configured an Oracle Fusion Middleware enterprise deployment. Note that the software binaries (in the Oracle home) are installed on the local storage device for each Web tier host.

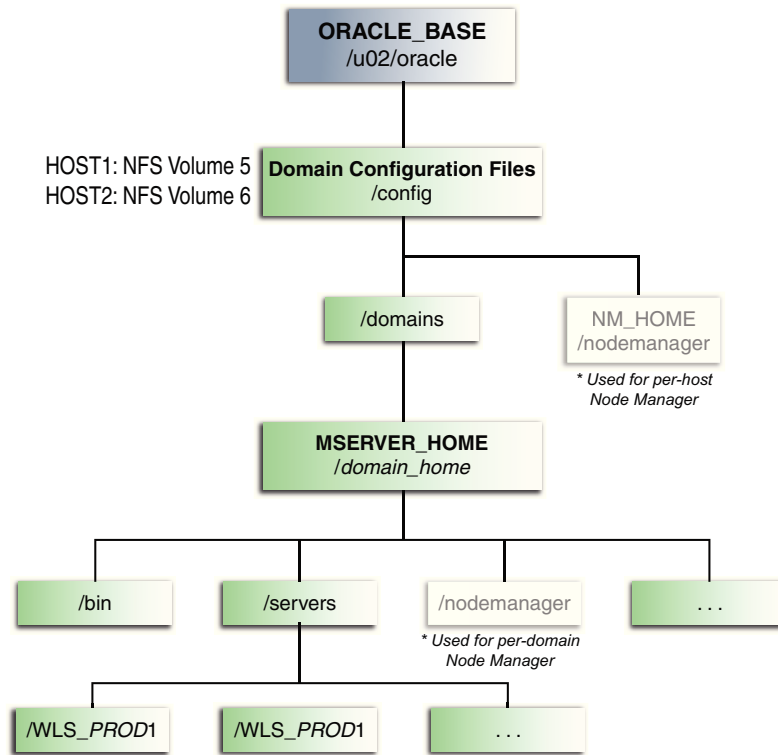
Where applicable, the diagrams also include the standard variables used to reference the directory locations in the installation and configuration procedures in this guide.

Figure 7-1 Recommended Shared Storage Directory Structure for an Enterprise Deployment



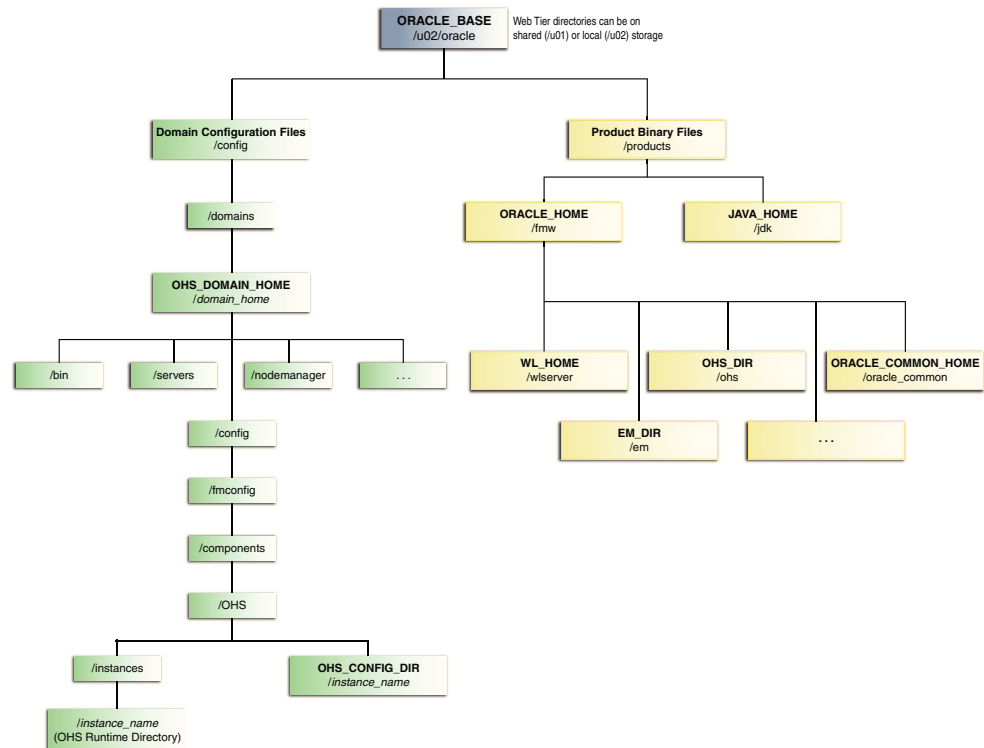
* For more information, see [About the Node Manager Configuration in a Typical Enterprise Deployment](#).

Figure 7-2 Recommended Local Storage Directory Structure for an Application Tier Host Computer in an Enterprise Deployment



* For more information, see [About the Node Manager Configuration in a Typical Enterprise Deployment](#).

Figure 7-3 Recommended Local Storage Directory Structure for a Web Tier Host Computer in an Enterprise Deployment



7.4 File System and Directory Variables Used in This Guide

Understanding the file system directories and the directory variables used to reference these directories is essential for installing and configuring the enterprise deployment topology.

Table 7-2 lists the file system directories and the directory variables used to reference the directories on the Application tier. Table 7-3 lists the file system directories and variables used to reference the directories on the Web tier.

For additional information about mounting these directories when you are using shared storage, see [About Creating and Mounting the Directories for an Enterprise Deployment](#).

Throughout this guide, the instructions for installing and configuring the topology refer to the directory locations using the variables shown here.

You can also define operating system variables for each of the directories listed in this section. If you define system variables for the particular UNIX shell you are using, you can then use the variables as they are used in this document, without having to map the variables to the actual values for your environment.

Note:

As you configure your storage devices to accommodate the recommended directory structure, note the actual directory paths in the Enterprise Deployment Workbook. You will use these addresses later when you enable the IP addresses on each host computer.

For more information, see [Using the Enterprise Deployment Workbook](#).

Table 7-2 Sample Values for Key Directory Variables on the Application Tier

Directory Variable	Description	Sample Value on the Application Tier
<i>ORACLE_BASE</i>	The base directory, under which Oracle products are installed.	<code>/u01/oracle</code>
<i>ORACLE_HOME</i>	The read-only location for the product binaries. For the application tier host computers, it is stored on shared disk. The Oracle home is created when you install the Oracle Fusion Middleware Infrastructure software. You can then install additional Oracle Fusion Middleware products into the same Oracle home.	<code>/u01/oracle/products/fmw</code>
<i>ORACLE_COMMON_HOME</i>	The directory within the Oracle Fusion Middleware Oracle home where common utilities, libraries, and other common Oracle Fusion Middleware products are stored.	<code>/u01/oracle/products/fmw/oracle_common</code>
<i>WL_HOME</i>	The directory within the Oracle home where the Oracle WebLogic Server software binaries are stored.	<code>/u01/oracle/products/fmw/wlserver</code>
<i>PROD_DIR</i>	Individual product directories for each Oracle Fusion Middleware product you install.	<code>/u01/oracle/products/fmw/prod_dir</code> The product can be <code>soa</code> , <code>wcc</code> , <code>bi</code> , or another value, depending on your enterprise deployment.
<i>EM_DIR</i>	The product directory used to store the Oracle Enterprise Manager Fusion Middleware Control software binaries.	<code>/u01/oracle/products/fmw/em</code>
<i>JAVA_HOME</i>	The location where you install the supported Java Development Kit (JDK).	<code>/u01/oracle/products/jdk</code>
<i>SHARED_CONFIG_DIR</i>	The shared parent directory for shared environment configuration files, including domain configuration, keystores, runtime artifacts, and application deployments	<code>/u01/oracle/config</code>
<i>ASERVER_HOME</i>	The Administration Server domain home, which is installed on shared disk.	<code>/u01/oracle/config/domains/domain_name</code> In this example, replace <code>domain_name</code> with the name of the WebLogic Server domain.
<i>MSERVER_HOME</i>	The Managed Server domain home, which is created via the <code>unpack</code> command on the local disk of each application tier host.	<code>/u02/oracle/config/domains/domain_name</code>

Table 7-2 (Cont.) Sample Values for Key Directory Variables on the Application Tier

Directory Variable	Description	Sample Value on the Application Tier
<i>APPLICATION_HOME</i>	The Application home directory, which is installed on shared disk, so the directory is accessible by all the application tier host computers.	<i>/u01/oracle/config/applications/domain_name</i>
<i>ORACLE_RUNTIME</i>	This directory contains the Oracle runtime artifacts, such as the JMS logs and TLogs. Typically, you mount this directory as a separate shared file system, which is accessible by all hosts in the domain. When you run the Configuration Wizard or perform post-configuration tasks, and you identify the location of JMS stores or tlogs persistent stores, then you can use this directory, qualified with the name of the domain, the name of the cluster, and the purpose of the directory. For example: <i>ORACLE_RUNTIME/cluster_name/jms</i>	<i>/u01/oracle/runtime/</i>
<i>NM_HOME</i>	The directory used by the Per Machine Node Manager start script and configuration files.	<i>/u02/oracle/config/node_manager</i>
	<hr/> Note: This directory is necessary only if you are using a Per Machine Node Manager configuration. <hr/>	
	For more information, see About the Node Manager Configuration in a Typical Enterprise Deployment .	
<i>DEPLOY_PLAN_HOME</i>	The deployment plan directory, which is used as the default location for application deployment plans.	<i>/u01/oracle/config/dp</i>
	<hr/> Note: This directory is required only when you are deploying custom applications to the application tier. <hr/>	

Table 7-2 (Cont.) Sample Values for Key Directory Variables on the Application Tier

Directory Variable	Description	Sample Value on the Application Tier
<code>KEYSTORE_HOME</code>	The shared location for custom certificates and keystores.	<code>/u01/oracle/config/keystores</code>

Table 7-3 Sample Values for Key Directory Variables on the Web Tier

Directory Variable	Description	Sample Value on the Web Tier
<code>OHS_ORACLE_HOME</code>	The read-only location for the Oracle HTTP Server product binaries. For the Web tier host computers, this directory is stored on local disk. The Oracle home is created when you install the Oracle HTTP Server software.	<code>/u02/oracle/products/fmw</code>
<code>ORACLE_COM_MON_HOME</code>	The directory within the Oracle HTTP Server Oracle home where common utilities, libraries, and other common Oracle Fusion Middleware products are stored.	<code>/u02/oracle/products/fmw/oracle_common</code>
<code>WL_HOME</code>	The directory within the Oracle home where the Oracle WebLogic Server software binaries are stored.	<code>/u02/oracle/products/fmw/wlserver</code>
<code>PROD_DIR</code>	Individual product directories for each Oracle Fusion Middleware product you install.	<code>/u02/oracle/products/fmw/ohs</code>
<code>JAVA_HOME</code>	The location where you install the supported Java Development Kit (JDK).	<code>/u02/oracle/products/jdk</code>
<code>OHS_DOMAIN_HOME</code>	The Domain home for the standalone Oracle HTTP Server domain, which is created when you install Oracle HTTP Server on the local disk of each Web tier host.	<code>/u02/oracle/config/domains/domain_name</code>
<code>OHS_CONFIG_DIR</code>	This is the location where you edit the Oracle HTTP Server configuration files (for example, <code>httpd.conf</code> and <code>moduleconf/*.conf</code>) on each Web host. Note this directory is also referred to as the OHS Staging Directory. Changes made here are later propagated to the OHS Runtime Directory. For more information, see Staging and Run-time Configuration Directories in the <i>Oracle Fusion Middleware Administering Oracle HTTP Server</i> .	<code>/u02/oracle/config/domains/domain_name/config/fmwconfig/components/OHS/instance_name</code>

7.5 About Creating and Mounting the Directories for an Enterprise Deployment

It is recommended to implement the following best practices when creating or mounting the top-level directories in an enterprise deployment.

When creating or mounting the top-level directories, note the following best practices:

- For the application tier, install the Oracle home (which contains the software binaries) on a second shared storage volume or second partition that is mounted to WCCHOST2. Be sure the directory path to the binaries on WCCHOST2 is identical to the directory path on WCCHOST1.

For example:

```
/u01/oracle/products/fmw/
```

For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

- This enterprise deployment guide assumes that the Oracle Web tier software will be installed on a local disk.

The Web tier installation is typically performed on local storage to the WEBHOST nodes. When using shared storage, you can install the Oracle Web tier binaries (and create the Oracle HTTP Server instances) on shared disk. However, if you do so, then the shared disk *must* be separate from the shared disk used for the application tier, and you must consider the appropriate security restrictions for access to the storage device across tiers.

As with the application tier servers (WCCHOST1 and WCCHOST2), use the same directory path on both computers.

For example:

```
/u02/oracle/products/fmw/
```

7.6 Summary of the Shared Storage Volumes in an Enterprise Deployment

It is important to understand the shared volumes and their purpose in a typical Oracle Fusion Middleware enterprise deployment.

The following table summarizes the shared volumes and their purpose in a typical Oracle Fusion Middleware enterprise deployment.

For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

Table 7-4 Shared Storage Volumes in an Enterprise Deployment

Volume in Shared Storage	Mounted to Host	Mount Directories	Description and Purpose
NFS Volume 1	WCCHOST1	/u01/oracle/ products/	Local storage for the product binaries to be used by WCCHOST1; this is where the Oracle home directory and product directories are installed.
NFS Volume 2	WCCHOST2	/u01/oracle/ products/	Local storage for the product binaries to be used by WCCHOST2; this is where the Oracle home directory and product directories are installed.

Table 7-4 (Cont.) Shared Storage Volumes in an Enterprise Deployment

Volume in Shared Storage	Mounted to Host	Mount Directories	Description and Purpose
NFS Volume 3	WCCHOST1 WCCHOST2	/u01/oracle/config/	Administration Server domain configuration, mounted to all hosts; used initially by WCCHOST1, but can be failed over to any host.
NFS Volume 4	WCCHOST1 WCCHOST2	/u01/oracle/runtime/	The runtime artifacts directory, mounted to all hosts, contains runtime artifacts such as JMS logs, blogs, and any cluster-dependent shared files needed.
NFS Volume 5	WCCHOST1	/u02/oracle/config/	Local storage for the Managed Server domain directory to be used by WCCHOST1, if the private Managed Server domain directory resides on shared storage.
NFS Volume 6	WCCHOST2	/u02/oracle/config/	Local storage for the Managed Server domain directory to be used by WCCHOST2, if the private Managed Server domain directory resides on shared storage.
NFS Volume 7	WEBHOST1	/u02/oracle/	Local storage for the Oracle HTTP Server software binaries (Oracle home) and domain configuration files used by WEBHOST1, if the private Managed Server domain directory resides on shared storage.

Table 7-4 (Cont.) Shared Storage Volumes in an Enterprise Deployment

Volume in Shared Storage	Mounted to Host	Mount Directories	Description and Purpose
NFS Volume 8	WEBHOST2	/u02/oracle/	Local storage for the Oracle HTTP Server software binaries (Oracle home) and domain configuration files used by WEBHOST2, if the private Managed Server domain directory resides on shared storage.

Preparing the Host Computers for an Enterprise Deployment

It is important to perform a set of tasks on each computer or server before configuring the enterprise deployment topology. This involves verifying the minimum hardware and operating system requirements for each host, configuring operating system users and groups, enabling Unicode support, mounting the required shared storage systems to the host and enabling the required virtual IP addresses on each host.

This chapter describes the tasks you must perform from each computer or server that will be hosting the enterprise deployment.

[Verifying the Minimum Hardware Requirements for Each Host](#)

After procuring the required hardware for the enterprise deployment, it is important to ensure that each host computer meets the minimum system requirements.

[Verifying Linux Operating System Requirements](#)

You can review the typical Linux operating system settings for an enterprise deployment in this section.

[Configuring Operating System Users and Groups](#)

The users and groups to be defined on each of the computers that host the enterprise deployment are listed in this section.

[Enabling Unicode Support](#)

It is recommended to enable Unicode support in your operating system so as to allow processing of characters in Unicode.

[Mounting the Required Shared File Systems on Each Host](#)

It is important to understand how to mount the shared storage to all the servers that require access.

[Enabling the Required Virtual IP Addresses on Each Host](#)

You must enable the required virtual IP addresses on each host in order to prepare the host for the enterprise deployment. The procedure varies, depending on whether you are using Oracle Enterprise Linux 5 or Oracle Enterprise Linux 6.

8.1 Verifying the Minimum Hardware Requirements for Each Host

After procuring the required hardware for the enterprise deployment, it is important to ensure that each host computer meets the minimum system requirements.

After you have procured the required hardware for the enterprise deployment, log in to each host computer and verify the system requirements listed in [Hardware and Software Requirements for the Enterprise Deployment Topology](#).

If you are deploying to a virtual server environment, such as Oracle Exalogic, ensure that each of the virtual servers meets the minimum requirements.

Ensure that you have sufficient local disk storage and shared storage configured as described in [Preparing the File System for an Enterprise Deployment](#).

Allow sufficient swap and temporary space; specifically:

- **Swap Space**—The system must have at least 500 MB.
- **Temporary Space**—There must be a minimum of 500 MB of free space in `/tmp`.

8.2 Verifying Linux Operating System Requirements

You can review the typical Linux operating system settings for an enterprise deployment in this section.

To ensure the host computers meet the minimum operating system requirements, be sure you have installed a certified operating system and that you have applied all the necessary patches for the operating system.

In addition, review the following sections for typical Linux operating system settings for an enterprise deployment.

[Setting Linux Kernel Parameters](#)

[Setting the Open File Limit and Number of Processes Settings on UNIX Systems](#)

[Verifying IP Addresses and Host Names in DNS or hosts File](#)

8.2.1 Setting Linux Kernel Parameters

The kernel-parameter and shell-limit values shown below are recommended values only. Oracle recommends that you tune these values to optimize the performance of the system. See your operating system documentation for more information about tuning kernel parameters.

Kernel parameters must be set to a minimum of those in [Table 8-1](#) on all nodes in the topology.

The values in the following table are the current Linux recommendations. For the latest recommendations for Linux and other operating systems, see *Oracle Fusion Middleware System Requirements and Specifications*.

If you are deploying a database onto the host, you might need to modify additional kernel parameters. Refer to 12c (12.2.1.2) Configuring Kernel Parameters in *Oracle Grid Infrastructure Installation Guide for Linux*.

Table 8-1 UNIX Kernel Parameters

Parameter	Value
kernel.sem	256 32000 100 142
kernel.shmmax	4294967295

To set these parameters:

1. Sign in as `root` and add or amend the entries in the file `/etc/sysctl.conf`.
2. Save the file.

3. Activate the changes by entering the following command:

```
/sbin/sysctl -p
```

8.2.2 Setting the Open File Limit and Number of Processes Settings on UNIX Systems

On UNIX operating systems, the `Open File Limit` is an important system setting, which can affect the overall performance of the software running on the host computer.

For guidance on setting the `Open File Limit` for an Oracle Fusion Middleware enterprise deployment, see [Host Computer Hardware Requirements](#).

Note:

The following examples are for Linux operating systems. Consult your operating system documentation to determine the commands to be used on your system.

For more information, see the following sections.

[Viewing the Number of Currently Open Files](#)

[Setting the Operating System Open File and Processes Limits](#)

8.2.2.1 Viewing the Number of Currently Open Files

You can see how many files are open with the following command:

```
/usr/sbin/lsof | wc -l
```

To check your open file limits, use the following commands.

C shell:

```
limit descriptors
```

Bash:

```
ulimit -n
```

8.2.2.2 Setting the Operating System Open File and Processes Limits

To change the `Open File Limit` values:

1. Sign in as `root` user and edit the following file:

```
/etc/security/limits.conf
```

2. Add the following lines to the `limits.conf` file. (The values shown here are for example only):

```
* soft nofile 4096
* hard nofile 65536
* soft nproc 2047
* hard nproc 16384
```

The `nfiles` values represent the open file limit; the `nproc` values represent the number of processes limit.

3. Save the changes, and close the `limits.conf` file.
4. Restart the host computer.

8.2.3 Verifying IP Addresses and Host Names in DNS or hosts File

Before you begin the installation of the Oracle software, ensure that the IP address, fully qualified host name, and the short name of the host are all registered with your DNS server. Alternatively, you can use the local `hosts` file and add an entry similar to the following:

```
IP_Address Fully_Qualified_Name Short_Name
```

For example:

```
10.229.188.205 host1.example.com host1
```

8.3 Configuring Operating System Users and Groups

The users and groups to be defined on each of the computers that host the enterprise deployment are listed in this section.

Groups

You must create the following groups on each node.

- `oinstall`
- `dba`

Users

You must create the following user on each node.

- `nobody`—An unprivileged user.
- `oracle`—The owner of the Oracle software. You may use a different name. The primary group for this account must be `oinstall`. The account must also be in the `dba` group.

Note:

- The group `oinstall` must have write privileges to all the file systems on shared and local storage that are used by the Oracle software.
 - Each group must have the same Group ID on every node.
 - Each user must have the same User ID on every node.
-
-

8.4 Enabling Unicode Support

It is recommended to enable Unicode support in your operating system so as to allow processing of characters in Unicode.

Your operating system configuration can influence the behavior of characters supported by Oracle Fusion Middleware products.

On UNIX operating systems, Oracle highly recommends that you enable Unicode support by setting the `LANG` and `LC_ALL` environment variables to a locale with the UTF-8 character set. This enables the operating system to process any character in Unicode. Oracle WebCenter Content technologies, for example, are based on Unicode.

If the operating system is configured to use a non-UTF-8 encoding, Oracle WebCenter Content components may function in an unexpected way. For example, a non-ASCII file name might make the file inaccessible and cause an error. Oracle does not support problems caused by operating system constraints.

8.5 Mounting the Required Shared File Systems on Each Host

It is important to understand how to mount the shared storage to all the servers that require access.

The shared storage configured, as described in [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#), must be available on the hosts that use it.

In an enterprise deployment, it is assumed that you have a hardware storage filer, which is available and connected to each of the host computers you have procured for the deployment.

You must mount the shared storage to all servers that require access.

Each host must have appropriate privileges set within the Network Attached Storage (NAS) or Storage Area Network (SAN) so that it can write to the shared storage.

Follow the best practices of your organization for mounting shared storage. This section provides an example of how to do this on Linux using NFS storage.

You must create and mount shared storage locations so that `WCCHOST1` and `WCCHOST2` can see the same location if it is a binary installation in two separate volumes.

For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

You use the following command to mount shared storage from a NAS storage device to a Linux host. If you are using a different type of storage device or operating system, refer to your manufacturer documentation for information about how to do this.

Note:

The user account used to create a shared storage file system owns and has read, write, and execute privileges for those files. Other users in the operating system group can read and execute the files, but they do not have write privileges.

For more information about installation and configuration privileges, see *Selecting an Installation User* in the *Oracle Fusion Middleware Installation Planning Guide*.

In the following example, `nasfiler` represents the shared storage filer. Also note that these are examples only. Typically, the mounting of these shared storage locations should be done using the `/etc/fstabs` file on UNIX systems, so that the mounting of these devices survives a reboot. Refer to your operating system documentation for more information.

1. Create the mount directories on WCCHOST1, as described in [Summary of the Shared Storage Volumes in an Enterprise Deployment](#), and then mount the shared storage. For example:

```
mount -t nfs nasfiler:VOL1/oracle/products/ /u01/oracle/products/
```

2. Repeat the procedure on WCCHOST2 using VOL2.

Validating the Shared Storage Configuration

Ensure that you can read and write files to the newly mounted directories by creating a test file in the shared storage location you just configured.

For example:

```
$ cd newly mounted directory
$ touch testfile
```

Verify that the owner and permissions are correct:

```
$ ls -l testfile
```

Then remove the file:

```
$ rm testfile
```

Note:

The shared storage can be a NAS or SAN device. The following example illustrates creating storage for a NAS device from WCCHOST1. The options may differ depending on the specific storage device.

```
mount -t nfs -o
rw,bg,hard,nointr,tcp,vers=3,timeo=300,rsize=32768,wsz=32768 nasfiler:VOL1/
Oracle/u01/oracle
```

Contact your storage vendor and machine administrator to learn about the appropriate options for your environment.

8.6 Enabling the Required Virtual IP Addresses on Each Host

You must enable the required virtual IP addresses on each host in order to prepare the host for the enterprise deployment. The procedure varies, depending on whether you are using Oracle Enterprise Linux 5 or Oracle Enterprise Linux 6.

Oracle Enterprise Linux 5

To prepare each host for the enterprise deployment, you must enable the virtual IP (VIP) addresses described in [Reserving the Required IP Addresses for an Enterprise Deployment](#).

It is assumed that you have already reserved the VIP addresses and host names and that they have been enabled by your network administrator. You can then enable the VIPs on the appropriate host.

Note that the virtual IP addresses used for the enterprise topology are not persisted because they are managed by Whole Server Migration (for selected Managed Servers and clusters) or by manual failover (for the Administration Server).

To enable the VIP addresses on each host, run the following commands as root:


```
/sbin/ifconfig interface:index IPAddress netmask netmask
/sbin/arping -q -U -c 3 -I interface IPAddress
```

where *interface* is eth0, or eth1, and *index* is 0, 1, or 2.

For example:

```
/sbin/ifconfig eth0:1 100.200.140.206 netmask 255.255.255.0
```

Enable your network to register the new location of the virtual IP address:

```
/sbin/arping -q -U -c 3 -I eth0 100.200.140.206
```

Validate that the address is available by using the ping command from another node, for example:

```
/bin/ping 100.200.140.206
```

Oracle Enterprise Linux 6 or Later

Starting with Oracle Enterprise Linux 6, the “ifconfig” command is deprecated and is replaced with the “ip” command.

To enable the VIP addresses on each host, run the following commands as root:

1. Determine the CIDR notation of the netmask. Each Netmask has a CIDR notation. For example, 255.255.240.0 has a CIDR of 20.

If the netmask you are adding is the same as the interface, the fastest way to determine this is to examine the existing IP address assigned to the network card. You can do this using the following command:

```
ip addr show dev bond0
```

Sample output:

```
2: bond0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast qlen 1000
link/ether 00:21:f6:03:85:9f brd ff:ff:ff:ff:ff:ff
int 192.168.20.1/20 brd 10.248.11.255 scope global bond0
```

In this example, the CIDR value is the value after the forward slash (/), which is, 20. If you are unsure of the CIDR value, contact your network administrator.

2. Add the IP address 192.168.20.3, net mask 255.255.240 (CIDR20) on network card bond0 using the following command:

```
ip addr add 192.168.20.3/20 dev bond0:1
```

3. For each of the virtual IP addresses you define, update the ARP caches using the following command:

```
arping -b -A -c 3 -I bond0 192.168.20.3
```

Note: Due to a known issue in the ifconfig utility, during server migration, all VIPs are dropped from the network interface on the machine the WebLogic Managed Server is migrated from. This happens when the VIP is enabled on : 0 of the network interface. To workaroud the issue, enable the VIPs on the network interface starting with : 1.

Preparing the Database for an Enterprise Deployment

Preparing the database for an enterprise deployment involves ensuring that the database meets specific requirements, creating database services, using SecureFiles for large objects in the database, and creating database backup strategies.

This chapter provides information about the database requirements, creating database services and about the database backup strategies.

[Overview of Preparing the Database for an Enterprise Deployment](#)

It is important to understand how to configure a supported database as part of an Oracle Fusion Middleware enterprise deployment.

[About Database Requirements](#)

Before configuring the enterprise deployment topology, you have to verify that the database meets the requirements described in the following sections.

[Creating Database Services](#)

When multiple Oracle Fusion Middleware products are sharing the same database, each product should be configured to connect to a separate, dedicated database service.

[Using SecureFiles for Large Objects \(LOBs\) in an Oracle Database](#)

SecureFiles is a new LOB storage architecture introduced in Oracle Database 11g Release 1. It is recommended to use SecureFiles for the Oracle Fusion Middleware schemas, in particular for the Oracle SOA Suite schemas.

[About Database Backup Strategies](#)

Performing a database backup at key points in the installation and configuration of an enterprise deployment enables you to recover quickly from any issue that might occur in the later configuration steps.

9.1 Overview of Preparing the Database for an Enterprise Deployment

It is important to understand how to configure a supported database as part of an Oracle Fusion Middleware enterprise deployment.

Most Oracle Fusion Middleware products require a specific set of schemas that must be installed in a supported database. The schemas are installed using the Oracle Fusion Middleware Repository Creation Utility (RCU).

In an enterprise deployment, Oracle recommends a highly available Real Application Clusters (Oracle RAC) database for the Oracle Fusion Middleware product schemas.

9.2 About Database Requirements

Before configuring the enterprise deployment topology, you have to verify that the database meets the requirements described in the following sections.

[Supported Database Versions](#)

[Additional Database Software Requirements](#)

[Installing and Validating Oracle Text](#)

9.2.1 Supported Database Versions

Use the following information to verify what databases are supported by each Oracle Fusion Middleware release and which version of the Oracle database you are currently running:

- For a list of all certified databases, refer to *Oracle Fusion Middleware Supported System Configurations*.
- To check the release of your database, query the `PRODUCT_COMPONENT_VERSION` view:

```
SQL> SELECT VERSION FROM SYS.PRODUCT_COMPONENT_VERSION WHERE  
        PRODUCT LIKE 'Oracle%';
```

Oracle Fusion Middleware requires that the database supports the AL32UTF8 character set. Check the database documentation for information on choosing a character set for the database.

For enterprise deployments, Oracle recommends using GridLink data sources to connect to Oracle RAC databases.

Note:

For more information about using GridLink data sources and SCAN, see *Using Active GridLink Data Sources in Oracle Fusion Middleware Administering JDBC Data Sources for Oracle WebLogic Server*.

9.2.2 Additional Database Software Requirements

In the enterprise topology, there are two database host computers in the data tier that host the two instances of the RAC database. We refer to these hosts as `DBHOST1` and `DBHOST2`.

Before you install or configure the enterprise topology, you must ensure that the following software is installed and available on `DBHOST1` and `DBHOST2`:

- **Oracle Clusterware**

For more information, see the *Installing Oracle Grid Infrastructure for a Cluster in Oracle Grid Infrastructure Installation Guide for Linux*.

- **Oracle Real Application Clusters**

For more information, see the *Installing Oracle RAC and Oracle RAC One Node in Oracle Real Application Clusters Installation Guide for Linux and UNIX*.

- **Time synchronization between Oracle RAC database instances**

The clocks of the database instances must be in sync if they are used by servers in a Fusion Middleware cluster configured with server migration.

- **Automatic Storage Management (optional)**

For more information, see the Introducing Oracle Automatic Storage Management in *Oracle Automatic Storage Management Administrator's Guide*.

9.2.3 Installing and Validating Oracle Text

Before you install or configure the WebCenter Content enterprise topology, you must be sure that Oracle Text is installed and available on DBHOST1 and DBHOST2.

For more information on installing Oracle Text, see the *Oracle Database Installation Guide for Linux*.

To make sure that the database used for WebCenter Content installation has Oracle Text enabled, run the following command:

```
SQL> select comp_name, status, substr(version,1,10) as version from dba_registry
where comp_id = 'CONTEXT';
```

```
COMP_NAME STATUS VERSION
-----
Oracle Text VALID 12.1.0.1.0
```

9.3 Creating Database Services

When multiple Oracle Fusion Middleware products are sharing the same database, each product should be configured to connect to a separate, dedicated database service.

Note:

The instructions in this section are for the Oracle Database 12c (12.1) release. If you are using another supported database, refer to the appropriate documentation library for more up-to-date and release-specific information.

For more information about connecting to Oracle databases using services, see *Overview of Using Dynamic Database Services to Connect to Oracle Databases in Real Application Clusters Administration and Deployment Guide*.

In addition, the database service should be different from the default database service. For complete instructions on creating and managing database services for an Oracle Database 12c database, see *Overview of Automatic Workload Management with Dynamic Database Services in Real Application Clusters Administration and Deployment Guide*.

Run-time connection load balancing requires configuring Oracle RAC Load Balancing Advisory with service-level goals for each service for which load balancing is enabled.

You can configure the Oracle RAC Load Balancing Advisory for `SERVICE_TIME` or `THROUGHPUT`. Set the connection load-balancing goal to **SHORT**.

You create and modify Oracle Database services using the `srvctl` utility.

To create and modify a database service:

1. Log in to SQL*Plus and create the service:

```
sqlplus "sys/password as sysdba"

SQL> EXECUTE DBMS_SERVICE.CREATE_SERVICE
(SERVICE_NAME => 'wccedg.example.com',
NETWORK_NAME => 'wccedg.example.com'
);
```

Note:

For the Service Name of the Oracle RAC database, use lowercase letters, followed by the domain name. For example:

```
wccedg.example.com
```

Note:

Enter the EXECUTE DBMS_SERVICE command shown on a single line.

For more information about the DBMS_SERVICE package, see DBMS_SERVICE in *Oracle Database PL/SQL Packages and Types Reference*.

2. Add the service to the database and assign it to the instances using srvctl:

```
srvctl add service -d wccdb -s wccedg.example.com -r wccdb1,wccdb2
```

3. Start the service:

```
srvctl start service -d wccdb -s wccedg.example.com
```

Note:

For complete instructions on creating and managing database services with SRVCTL, see *Creating Services with SRVCTL* in the *Real Application Clusters Administration and Deployment Guide*.

4. Modify the service so it uses the Load Balancing Advisory and the appropriate service-level goals for run-time connection load balancing.

More specifically, use the following resources in the Oracle Database 12c *Real Application Clusters Administration and Deployment Guide* to set the SERVICE_TIME and THROUGHPUT service-level goals:

- Overview of the Load Balancing Advisory
- Configuring Your Environment to Use the Load Balancing Advisory

9.4 Using SecureFiles for Large Objects (LOBs) in an Oracle Database

SecureFiles is a new LOB storage architecture introduced in Oracle Database 11g Release 1. It is recommended to use SecureFiles for the Oracle Fusion Middleware schemas, in particular for the Oracle SOA Suite schemas.

Beginning with Oracle Database 11g Release 1, Oracle introduced SecureFiles, a new LOB storage architecture. Oracle recommends using SecureFiles for the Oracle Fusion

Middleware schemas, in particular for the Oracle SOA Suite schemas. For more information, see Using Oracle SecureFiles LOBs in the *Oracle Database SecureFiles and Large Objects Developer's Guide*.

In Oracle 12c Databases, the default setting for using SecureFiles is `PREFERRED`. This means that the database attempts to create a SecureFiles LOB unless a BasicFiles LOB is explicitly specified for the LOB or the parent LOB (if the LOB is in a partition or sub-partition). The Oracle Fusion Middleware schemas do not explicitly specify BasicFiles, which means that Oracle Fusion Middleware LOBs will default to SecureFiles when installed in an Oracle 12c database.

For Oracle 11g databases, the `db_securefile` system parameter controls the SecureFiles usage policy. This parameter can be modified dynamically. The following options can be used for using SecureFiles:

- `PERMITTED`: allows SecureFiles to be created (This is the default setting for `db_securefile`. The default storage method uses BasicFiles)
- `FORCE`: create all (new) LOBs as SecureFiles
- `ALWAYS`: try to create LOBs as SecureFiles, but fall back to BasicFiles if not possible (if ASSM is disabled)

Other values for the `db_securefile` parameter are:

- `IGNORE`: ignore attempts to create SecureFiles
- `NEVER`: disallow new SecureFiles creations

For Oracle 11g Databases, Oracle recommends that you set the `db_securefile` parameter to `FORCE` before creating the Oracle Fusion Middleware schemas with the Repository Creation Utility (RCU).

Note that the SecureFiles segments require tablespaces managed with automatic segment space management (ASSM). This means that LOB creation on SecureFiles will fail if ASSM is not enabled. However, the Oracle Fusion Middleware tablespaces are created by default with ASSM enabled. As a result, with the default configuration, nothing needs to be changed to enable SecureFiles for the Oracle Fusion Middleware schemas.

9.5 About Database Backup Strategies

Performing a database backup at key points in the installation and configuration of an enterprise deployment enables you to recover quickly from any issue that might occur in the later configuration steps.

At key points in the installation and configuration of an enterprise deployment, this guide recommends that you back up your current environment. For example, after you install the product software and create the schemas for a particular Oracle Fusion Middleware product, you should perform a database backup. Performing a backup allows you to perform a quick recovery from any issue that might occur in the later configuration steps.

You can choose to use your own backup strategy for the database, or you can simply make a backup using operating system tools or RMAN for this purpose.

Oracle recommends using Oracle Recovery Manager for the database, particularly if the database was created using Oracle Automatic Storage Management. If possible, you can also perform a cold backup using operating system tools such as `tar`.

Part III

Configuring the Enterprise Deployment

The tasks that need to be performed to configure the enterprise deployment topology are detailed in this section.

Part III contains the following chapters:

[Creating the Initial Infrastructure Domain for an Enterprise Deployment](#)

[Configuring the Web Tier for an Enterprise Deployment](#)

[Extending the Domain to Include Oracle WebCenter Content](#)

You need to perform certain tasks in order to extend the enterprise deployment domain with the Oracle WebCenter Content software. This includes installing the WebCenter Content, extending the domain for WebCenter Content and completing post-configuration and verification tasks.

[Extending the Domain with Oracle SOA Suite](#)

[Extending the Domain to Include Inbound Refinery](#)

[Extending the Domain to Include Capture](#)

You need to perform certain tasks in order to extend the enterprise deployment domain with Oracle WebCenter Enterprise Capture software.

[Extending the Domain to Include WebCenter Content User Interface](#)

You need to perform certain tasks in order to extend the enterprise deployment domain to include Oracle WebCenter Content User Interface software.

Creating the Initial Infrastructure Domain for an Enterprise Deployment

It is important to understand how to install and configure an initial domain, which can be used as the starting point for an enterprise deployment. You can extend this initial domain with the various products and components that constitute the enterprise topology you are deploying.

This chapter provides information on variables used when creating the infrastructure domain, creating the database schemas and configuring the infrastructure domain.

Variables Used When Creating the Infrastructure Domain

While creating the infrastructure domain, you will be referencing the directory variables listed in this section.

Understanding the Initial Infrastructure Domain

Before creating the initial Oracle Fusion Middleware Infrastructure domain, ensure that you review the following key concepts.

Installing the Oracle Fusion Middleware Infrastructure on WCCHOST1

Use the following sections to install the Oracle Fusion Middleware Infrastructure software in preparation for configuring a new domain for an enterprise deployment.

Creating the Database Schemas

Before you can configure a Fusion Middleware Infrastructure domain, you must install the schemas listed in this section in a certified database for use with this release of Oracle Fusion Middleware.

Configuring the Infrastructure Domain

You can create and configure a WebLogic domain for the enterprise deployment topology using the configuration wizard.

Starting the Administration Server

After the domain is created, you can then perform the following tasks on WCCHOST1.

Creating a New LDAP Authenticator and Provisioning Enterprise Deployment Users and Group

When you configure an Oracle Fusion Middleware domain, the domain is configured by default to use the WebLogic Server authentication provider (`DefaultAuthenticator`). However, for an enterprise deployment, Oracle recommends that you use a dedicated, centralized LDAP-compliant authentication provider.

10.1 Variables Used When Creating the Infrastructure Domain

While creating the infrastructure domain, you will be referencing the directory variables listed in this section.

The directory variables are defined in [File System and Directory Variables Used in This Guide](#).

- `ORACLE_HOME`
- `APPLICATION_HOME`
- `JAVA_HOME`

In addition, you'll be referencing the following virtual IP (VIP) addresses and host names defined in [Reserving the Required IP Addresses for an Enterprise Deployment](#):

- ADMINVHN
- WCCHOST1
- WCCHOST2
- DBHOST1
- DBHOST2
- SCAN Address for the Oracle RAC Database (`DB-SCAN.example.com`)

10.2 Understanding the Initial Infrastructure Domain

Before creating the initial Oracle Fusion Middleware Infrastructure domain, ensure that you review the following key concepts.

[About the Infrastructure Distribution](#)

[Characteristics of the Initial Infrastructure Domain](#)

10.2.1 About the Infrastructure Distribution

You create the initial Infrastructure domain for an enterprise deployment using the Oracle Fusion Middleware Infrastructure distribution. This distribution contains both the Oracle WebLogic Server software and the Oracle JRF software.

The Oracle JRF software consists of Oracle Web Services Manager, Oracle Application Development Framework (Oracle ADF), Oracle Enterprise Manager Fusion Middleware Control, the Repository Creation Utility (RCU), and other libraries and technologies required to support the Oracle Fusion Middleware products.

Later in this guide, you can then extend the domain to support the Oracle Fusion Middleware products required for your enterprise deployment.

For more information, see "Understanding Oracle Fusion Middleware Infrastructure" in *Understanding Oracle Fusion Middleware*.

10.2.2 Characteristics of the Initial Infrastructure Domain

The following table lists some of the key characteristics of the initial Infrastructure domain. By reviewing and understanding these characteristics, you can better understand the purpose and context of the procedures used to configure the domain.

Many of these characteristics are described in more detail in [Understanding a Typical Enterprise Deployment](#).

Characteristic of the Domain	More Information
Contains only an Administration Server. Managed Servers are added to the domain later, when you extend the initial domain to include Oracle Fusion Middleware products.	About a Typical Enterprise Deployment
Uses a separate virtual IP (VIP) address for the Administration Server.	Configuration of the Administration Server and Managed Servers Domain Directories
Uses a per domain Node Manager configuration.	About the Node Manager Configuration in a Typical Enterprise Deployment
Requires a separately installed LDAP-based authentication provider.	Understanding OPSS and Requests to the Authentication and Authorization Stores

10.3 Installing the Oracle Fusion Middleware Infrastructure on WCCHOST1

Use the following sections to install the Oracle Fusion Middleware Infrastructure software in preparation for configuring a new domain for an enterprise deployment.

[Installing a Supported JDK](#)

[Starting the Infrastructure Installer on WCCHOST1](#)

[Navigating the Infrastructure Installation Screens](#)

[Installing Oracle Fusion Middleware Infrastructure on the Other Host Computers](#)

[Checking the Directory Structure](#)

After you install the Oracle Fusion Middleware Infrastructure and create the Oracle home, you should see the directory and sub-directories listed in this topic. The contents of your installation vary based on the options you selected during the installation.

10.3.1 Installing a Supported JDK

Oracle Fusion Middleware requires that a certified Java Development Kit (JDK) is installed on your system. See the following sections for more information:

[Locating and Downloading the JDK Software](#)

[Installing the JDK Software](#)

10.3.1.1 Locating and Downloading the JDK Software

To find a certified JDK, see the certification document for your release on the Oracle Fusion Middleware Supported System Configurations page.

After you identify the Oracle JDK for the current Oracle Fusion Middleware release, you can download an Oracle JDK from the following location on Oracle Technology Network:

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

Be sure to navigate to the download for the Java SE JDK.

10.3.1.2 Installing the JDK Software

Install the JDK in the following locations:

- On the shared storage device, where it will be accessible from each of the application tier host computers. Install the JDK in the `/u01/oracle/products/jdk` directory.
- On the local storage device for each of the Web tier host computers.

The Web tier host computers, which reside in the DMZ, do not necessarily have access to the shared storage on the application tier.

For more information about the recommended location for the JDK software, see the [Understanding the Recommended Directory Structure for an Enterprise Deployment](#).

The following example describes how to install a recent version of JDK 1.8.0_101.

1. Change directory to the location where you downloaded the JDK archive file.

```
cd download_dir
```

2. Unpack the archive into the JDK home directory, and then run the following commands:

```
tar -xzf jdk-8u101-linux-x64.tar.gz
```

Note that the JDK version listed here was accurate at the time this document was published. For the latest supported JDK, see the *Oracle Fusion Middleware System Requirements and Specifications* for the current Oracle Fusion Middleware release.

3. Move the JDK directory to the recommended location in the directory structure.

For example:

```
mv ../jdk1.8.0_101 /u01/oracle/products/jdk
```

For more information, see [File System and Directory Variables Used in This Guide](#).

4. Define the `JAVA_HOME` and `PATH` environment variables for running Java on the host computer.

For example:

```
export JAVA_HOME=/u01/oracle/products/jdk
export PATH=$JAVA_HOME/bin:$PATH
```

5. Run the following command to verify that the appropriate java executable is in the path and your environment variables are set correctly:

```
java -version
java version "1.8.0_101"
Java(TM) SE Runtime Environment (build 1.8.0_101-b14)
Java HotSpot(TM) 64-Bit Server VM (build 25.91-b14, mixed mode)
```

10.3.2 Starting the Infrastructure Installer on WCCHOST1

To start the installation program, perform the following steps.

1. Log in to WCCHOST1.

2. Go to the directory where you downloaded the installation program.
3. Launch the installation program by invoking the `java` executable from the JDK directory on your system, as shown in the example below.

```
$JAVA_HOME/bin/java -d64 -jar distribution_file_name.jar
```

In this example:

- Replace `JAVA_HOME` with the environment variable or actual JDK location on your system.
- Replace `distribution_file_name` with the actual name of the distribution JAR file.

Note that if you download the distribution from the Oracle Technology Network (OTN), then the JAR file is typically packaged inside a downloadable ZIP file.

To install the software required for the initial Infrastructure domain, the distribution you want to install is `fmw_12.2.1.2.0_infrastructure_generic.jar`.

For more information about the actual file names of each distribution, see [Identifying and Obtaining Software Downloads for an Enterprise Deployment](#).

When the installation program appears, you are ready to begin the installation. See [Navigating the Installation Screens](#) for a description of each installation program screen.

10.3.3 Navigating the Infrastructure Installation Screens

The installation program displays a series of screens, in the order listed in the following table.

If you need additional help with any of the installation screens, click the screen name or click the **Help** button on the screen.

Table 10-1 *Navigating the Infrastructure Installation Screens*

Screen	Description
Installation Inventory Setup	<p>On UNIX operating systems, this screen will appear if this is the first time you are installing any 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.</p> <p>For more information about the central inventory, see Understanding the Oracle Central Inventory in <i>Oracle Fusion Middleware Installing Software with the Oracle Universal Installer</i>.</p>
Welcome	This screen introduces you to the product installer.
Auto Updates	Use this screen to automatically search My Oracle Support for available patches or automatically search a local directory for patches that you've already downloaded for your organization.

Table 10-1 (Cont.) Navigating the Infrastructure Installation Screens

Screen	Description
Installation Location	Use this screen to specify the location of your Oracle home directory. For the purposes of an enterprise deployment, enter the value of the <code>ORACLE_HOME</code> variable listed in Table 7-2 .
Installation Type	Use this screen to select the type of installation and consequently, the products and feature sets you want to install. For this topology, select Fusion Middleware Infrastructure .
<hr/> Note: The topology in this document does not include server examples. Oracle strongly recommends that you do not install the examples into a production environment. <hr/>	
Prerequisite Checks	This screen verifies that your system meets the minimum necessary requirements. If there are any warning or error messages, refer to the Oracle Fusion Middleware System Requirements and Specifications document on the Oracle Technology Network (OTN).
Security Updates	If you already have an Oracle Support account, use this screen to indicate how you would like to receive security updates. If you do not have one and are sure you want to skip this step, clear the check box and verify your selection in the follow-up dialog box.
Installation Summary	Use this screen to verify the installation options you selected. 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. Response files can be used later in a silent installation situation. For more information about silent or command-line installation, see <i>Using the Oracle Universal Installer in Silent Mode</i> in <i>Oracle Fusion Middleware Installing Software with the Oracle Universal Installer</i> .
Installation Progress	This screen allows you to see the progress of the installation.
Installation Complete	This screen appears when the installation is complete. Review the information on this screen, then click Finish to dismiss the installer.

10.3.4 Installing Oracle Fusion Middleware Infrastructure on the Other Host Computers

If you have configured a separate shared storage volume or partition for WCCHOST2, then you must also install the Infrastructure on WCCHOST2.

For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

To install the software on the other host computers in the topology, log in to each host, and use the instructions in [Starting the Infrastructure Installer on WCCHOST1](#) and

[Navigating the Infrastructure Installation Screens](#) to create the Oracle home on the appropriate storage device.

Note:

In previous releases, the recommended enterprise topology included a colocated set of Oracle HTTP Server instances. In those releases, there was a requirement to install the Infrastructure on the Web Tier hosts (WEBHOST1 and WEBHOST2). However, for this release, the enterprise deployment topology assumes the Web servers are installed and configured in standalone mode, so they are not considered part of the application tier domain. For more information, see [Configuring the Web Tier for an Enterprise Deployment](#)

10.3.5 Checking the Directory Structure

After you install the Oracle Fusion Middleware Infrastructure and create the Oracle home, you should see the directory and sub-directories listed in this topic. The contents of your installation vary based on the options you selected during the installation.

To check the directory structure:

1. Change to the *ORACLE_HOME* directory where you installed the Infrastructure.
2. Enter the following command:

```
ls --format=single-column
```

The directory structure on your system must match the structure shown in the following example:

```
cfgtoollogs
coherence
em
install
inventory
OPatch
oracle_common
oraInst.loc
oui
wlserver
```

For more information about the directory structure after the installation complete, see *What are the Key Oracle Fusion Middleware Directories?* in *Understanding Oracle Fusion Middleware*.

10.4 Creating the Database Schemas

Before you can configure a Fusion Middleware Infrastructure domain, you must install the schemas listed in this section in a certified database for use with this release of Oracle Fusion Middleware.

- Metadata Services (MDS)
- Audit Services (IAU)
- Audit Services Append (IAU_APPEND)

- Audit Services Viewer (IAU_VIEWER)
- Oracle Platform Security Services (OPSS)
- User Messaging Service (UMS)
- WebLogic Services (WLS)
- Common Infrastructure Services (STB)

You use the Repository Creation Utility (RCU) to create the schemas. This utility is installed in the Oracle home for each Oracle Fusion Middleware product. For more information about RCU and how the schemas are created and stored in the database, see *Preparing for Schema Creation in Creating Schemas with the Repository Creation Utility*.

Follow the instructions in this section to install the required schemas.

[Installing and Configuring a Certified Database](#)

[Starting the Repository Creation Utility \(RCU\)](#)

[Navigating the RCU Screens to Create the Schemas](#)

10.4.1 Installing and Configuring a Certified Database

Make sure you have installed and configured a certified database, and that the database is up and running.

For more information, see the [Preparing the Database for an Enterprise Deployment](#).

10.4.2 Starting the Repository Creation Utility (RCU)

To start the Repository Creation Utility (RCU):

1. Set the `JAVA_HOME` environment variable so it references the location where you installed a supported JDK.

For more information, see [File System and Directory Variables Used in This Guide](#).

2. Navigate to the following directory on WCCHOST1:

```
ORACLE_HOME/oracle_common/bin
```

3. Start RCU:

```
./rcu
```

10.4.3 Navigating the RCU Screens to Create the Schemas

Follow the instructions in this section to create the schemas for the Fusion Middleware Infrastructure domain:

- [Task 1, "Introducing RCU"](#)
- [Task 2, "Selecting a Method of Schema Creation"](#)
- [Task 3, "Providing Database Credentials"](#)
- [Task 4, "Specifying a Custom Prefix and Selecting Schemas"](#)

- [Task 5, "Specifying Schema Passwords"](#)
- [Task 6, "Completing Schema Creation"](#)

Task 1 Introducing RCU

Review the Welcome screen and verify the version number for RCU. Click **Next** to begin.

Task 2 Selecting a Method of Schema Creation

If you have the necessary permission and privileges to perform DBA activities on your database, select **System Load and Product Load** on the Create Repository screen. The procedure in this document assumes that you have the necessary privileges.

If you do not have the necessary permission or privileges to perform DBA activities in the database, you must select **Prepare Scripts for System Load** on this screen. This option will generate a SQL script, which can be provided to your database administrator. See Understanding System Load and Product Load in *Creating Schemas with the Repository Creation Utility*.

Tip:

For more information about the options on this screen, see Create repository in *Creating Schemas with the Repository Creation Utility*.

Task 3 Providing Database Credentials

On the Database Connection Details screen, provide the database connection details for RCU to connect to your database.

In the **Host Name** field, enter the SCAN address of the Oracle RAC Database.

Click **Next** to proceed, then click **OK** in the dialog window confirming that connection to the database was successful.

Tip:

For more information about the options on this screen, see Database Connection Details in *Creating Schemas with the Repository Creation Utility*.

Task 4 Specifying a Custom Prefix and Selecting Schemas

1. Specify the custom prefix you want to use to identify the Oracle Fusion Middleware schemas.

The custom prefix is used to logically group these schemas together for use in this domain. For the purposes of this guide, use the prefix FMW12212.

Tip:

Make a note of the custom prefix you choose to enter here; you will need this later, during the domain creation process.

For more information about custom prefixes, see Understanding Custom Prefixes in *Creating Schemas with the Repository Creation Utility*.

2. Select **AS Common Schemas**.

When you select **AS Common Schemas**, all of the schemas in this section are automatically selected.

If the schemas in this section are not automatically selected, then select the required schemas.

A schema called **Common Infrastructure Services** is also automatically created; this schema is grayed out and cannot be selected or deselected. This schema (the STB schema) enables you to retrieve information from RCU during domain configuration. For more information, see Understanding the Service Table Schema in *Creating Schemas with the Repository Creation Utility*.

Tip:

For more information about how to organize your schemas in a multi-domain environment, see Planning Your Schema Creation in *Creating Schemas with the Repository Creation Utility*.

Click **Next** to proceed, then click **OK** on the dialog window confirming that prerequisite checking for schema creation was successful.

Task 5 Specifying Schema Passwords

Specify how you want to set the schema passwords on your database, then specify and confirm your passwords.

Tip:

You must make a note of the passwords you set on this screen; you will need them later on during the domain creation process.

Task 6 Completing Schema Creation

Navigate through the remainder of the RCU screens to complete schema creation.

For the purposes of this guide, you can accept the default settings on the remaining screens, or you can customize how RCU creates and uses the required tablespaces for the Oracle Fusion Middleware schemas.

For more information about RCU and its features and concepts, see About the Repository Creation Utility in *Oracle Fusion Middleware Creating Schemas with the Repository Creation Utility*.

When you reach the Completion Summary screen, click **Close** to dismiss RCU.

10.5 Configuring the Infrastructure Domain

You can create and configure a WebLogic domain for the enterprise deployment topology using the configuration wizard.

For more information on other methods available for domain creation, see "Additional Tools for Creating, Extending, and Managing WebLogic Domains" in *Creating WebLogic Domains Using the Configuration Wizard*.

[Starting the Configuration Wizard](#)

[Navigating the Configuration Wizard Screens to Configure the Infrastructure Domain](#)

10.5.1 Starting the Configuration Wizard

To begin domain configuration, run the following command in the Oracle Fusion Middleware Oracle home on WCCHOST1.

```
ORACLE_HOME/oracle_common/common/bin/config.sh
```

10.5.2 Navigating the Configuration Wizard Screens to Configure the Infrastructure Domain

Follow the instructions in this section to create and configure the domain for the topology.

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Create a New Domain**.

In the **Domain Location** field, specify the value of the `ASERVER_HOME` variable, as defined in [File System and Directory Variables Used in This Guide](#).

Tip:

For more information about the other options on this screen of the Configuration Wizard, see "Configuration Type" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Templates

On the Templates screen, make sure **Create Domain Using Product Templates** is selected, then select the following templates:

- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**

Selecting this template automatically selects the following dependencies:

- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Selecting the Application Home Location

On the Application Location screen, specify the value of the `APPLICATION_HOME` variable, as defined in [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the options on this screen can be found in Application Location in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Configuring the Administrator Account

On the Administrator Account screen, specify the user name and password for the default WebLogic Administrator account for the domain.

Make a note of the user name and password specified on this screen; you will need these credentials later to boot and connect to the domain's Administration Server.

Task 5 Specifying the Domain Mode and JDK

On the Domain Mode and JDK screen:

- Select **Production** in the **Domain Mode** field.
- Select the **Oracle Hotspot** JDK in the **JDK** field.

Selecting **Production Mode** on this screen gives your environment a higher degree of security, requiring a user name and password to deploy applications and to start the Administration Server.

Tip:

More information about the options on this screen, including the differences between development mode and production mode, can be found in Domain Mode and JDK in *Creating WebLogic Domains Using the Configuration Wizard*.

In production mode, a boot identity file can be created to bypass the need to provide a user name and password when starting the Administration Server. For more information, see [Creating the boot.properties File](#).

Task 6 Specifying the Database Configuration Type

Select **RCU Data** to activate the fields on this screen.

The **RCU Data** option instructs the Configuration Wizard to connect to the database and Service Table (STB) schema to automatically retrieve schema information for the schemas needed to configure the domain.

Note:

If you choose to select **Manual Configuration** on this screen, you will have to manually fill in the parameters for your schema on the JDBC Component Schema screen.

After selecting **RCU Data**, fill in the fields as shown in the following table. Refer to [#unique_141/unique_141_Connect_42_BABHHCBF](#) for a partial screen shot of a sample Database Configuration Type screen.

Field	Description
DBMS/Service	<p>Enter the service name for the Oracle RAC database where you will install the product schemas. For example:</p> <p><code>orcl.example.com</code></p> <p>Be sure this is the common service name that is used to identify all the instances in the Oracle RAC database; do not use the host-specific service name.</p>

Field	Description
Host Name	Enter the Single Client Access Name (SCAN) Address for the Oracle RAC database, which you entered in the <i>Enterprise Deployment Workbook</i> .
Port	Enter the port number on which the database listens. For example, 1521.
Schema Owner Schema Password	Enter the user name and password for connecting to the database's Service Table schema. This is the schema user name and password that was specified for the Service Table component on the Schema Passwords screen in RCU (see Creating the Database Schemas). The default user name is <i>prefix_STB</i> , where <i>prefix</i> is the custom prefix that you defined in RCU.

Click **Get RCU Configuration** when you are finished specifying the database connection information. The following output in the Connection Result Log indicates that the operation succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Click **Next** if the connection to the database is successful.

Tip:

More information about the **RCU Data** option can be found in "Understanding the Service Table Schema" in *Creating Schemas with the Repository Creation Utility*.

More information about the other options on this screen can be found in Datasource Defaults in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Specifying JDBC Component Schema Information

Verify that the values on the JDBC Component Schema screen are correct for all schemas.

The schema table should be populated because you selected **Get RCU Data** on the previous screen. As a result, the Configuration Wizard locates the database connection values for all the schemas required for this domain.

At this point, the values are configured to connect to a single-instance database. However, for an enterprise deployment, you should use a highly available Real Application Clusters (RAC) database, as described in [Preparing the Database for an Enterprise Deployment](#).

In addition, Oracle recommends that you use an Active GridLink datasource for each of the component schemas. For more information about the advantages of using GridLink data sources to connect to a RAC database, see "Database Considerations" in the *High Availability Guide*.

To convert the data sources to GridLink:

1. Select all the schemas by selecting the check box at in the first header row of the schema table.
2. Click **Convert to GridLink** and click **Next**.

Task 8 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, provide the information required to connect to the RAC database and component schemas, as shown in [Table 10-2](#) and in [#unique_141/unique_141_Connect_42_BABJBCFF](#).

Element	Description and Recommended Value
SCAN, Host Name, and Port	Select the SCAN check box. In the Host Name field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database. In the Port field, enter the SCAN listening port for the database (for example, 1521).
ONS Host and Port	In the ONS Port field, enter the SCAN address for the Oracle RAC database. In the Port field, enter the ONS Remote port (typically, 6200).
Enable Fan	Select the Enable Fan check box to receive and process FAN events.

For more information about specifying the information on this screen, as well as information about how to identify the correct SCAN address, see "Configuring Active GridLink Data Sources with Oracle RAC" in the *High Availability Guide*.

You can also click **Help** to display a brief description of each field on the screen.

Task 9 Testing the JDBC Connections

Use the JDBC Component Schema Test screen to test the data source connections you have just configured.

A green check mark in the **Status** column indicates a successful test. If you encounter any issues, see the error message in the Connection Result Log section of the screen, fix the problem, then try to test the connection again.

Tip:

More information about the other options on this screen can be found in Test Component Schema in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 10 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Administration Server**

This is required to properly configure the listen address of the Administration Server.

- **Node Manager**

This is required to configure Node Manager.

- **Topology**

This is required to configure the Managed Servers and cluster, and also for configuring the machine and targeting the Managed Servers to the machine.

Note:

When using the Advanced Configuration screen in the Configuration Wizard:

- If any of the above options are not available on the screen, then return to the Templates screen, and be sure you selected the required templates for this topology.
 - Do not select the **Domain Frontend Host Capture** advanced configuration option. You will later configure the frontend host property for specific clusters, rather than for the domain.
-
-

Task 11 Configuring the Administration Server Listen Address

On the Administration Server screen:

1. In the **Server Name** field, retain the default value - AdminServer.
2. In the **Listen Address** field, enter the virtual host name that corresponds to the VIP of the ADMINVHN that you procured in [Procuring Resources for an Enterprise Deployment](#) and enabled in [Preparing the Host Computers for an Enterprise Deployment](#).

For more information on the reasons for using the ADMINVHN virtual host, see [Reserving the Required IP Addresses for an Enterprise Deployment](#).

3. Leave the other fields at their default values.

In particular, be sure that no server groups are assigned to the Administration Server.

Task 12 Configuring Node Manager

Select **Per Domain Default Location** as the Node Manager type, then specify the Node Manager credentials you will use to connect to the Node Manager.

Tip:

For more information about the options on this screen, see Node Manager in *Creating WebLogic Domains Using the Configuration Wizard*.

For more information about per domain and per host Node Manager implementations, see [About the Node Manager Configuration in a Typical Enterprise Deployment](#).

For additional information, see Configuring Node Manager on Multiple Machines in *Administering Node Manager for Oracle WebLogic Server*.

Task 13 Configuring Managed Servers

There are no Managed Servers in the initial Infrastructure domain. Click **Next** to proceed to the next screen.

Task 14 Configuring a Cluster

There are no clusters in the initial Infrastructure domain. Click **Next** to proceed to the next screen.

Task 15 Configure Server Templates

There are no server templates in the initial Infrastructure domain. Click **Next** to proceed to the next screen.

Task 16 Configure Coherence Clusters

There are no clusters in the initial Infrastructure domain. Click **Next** to proceed to the next screen.

Task 17 Creating Machines

Use the Machines screen to create a new machine in the domain. A machine is required in order for the Node Manager to be able to start and stop the servers.

1. Select the **Unix Machine** tab.
2. Click the **Add** button to create a new Unix machine.
Use the values in [Table 10-3](#) to define the Name and Node Manager Listen Address of the new machine.
3. Verify the port in the **Node Manager Listen Port** field.
The port number 5556, shown in this example, may be referenced by other examples in the documentation. Replace this port number with your own port number as needed.

Name	Node Manager Listen Address	Node Manager Listen Port
ADMINHOST	Enter the value of the ADMINVHN variable.	5556

Tip:

More information about the options on this screen can be found in Machines in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 18 Assigning Server To Machine

Complete the following steps:

1. Select admin server from the Server pane.
2. Select ADMINHOST from the Machines pane.
3. Click **Next** to proceed to the next screen.

Task 19 Reviewing Virtual Targets

Click **Next** to proceed to the next screen.

Task 20 Reviewing Partitions

Click **Next** to proceed to the next screen.

Task 21 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Domain creation will not begin until you click **Create**.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 22 Monitoring Configuration Progress

After all the processes are complete, click **Next** to proceed to the next screen.

Task 23 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the configuration wizard.

10.6 Starting the Administration Server

After the domain is created, you can then perform the following tasks on WCCHOST1.

[Starting the Node Manager in the Administration Server Domain Home on WCCHOST1](#)

Use these steps to start the per-domain Node Manager for the `ASERVER_HOME` domain directory.

[Creating the boot.properties File](#)

You must create a `boot.properties` if you want to start the Administration Server without being prompted for the Administration Server credentials. This step is required in an enterprise deployment. The credentials you enter in this file are encrypted when you start the Administration Server.

Starting the Administration Server Using the Node Manager

After you have configured the domain and configured the Node Manager, you can start the Administration Server, using the Node Manager. In an enterprise Deployment, the Node Manager is used to start and stop the Administration Server and all the Managed Servers in the domain.

Validating the Administration Server

Before proceeding with the configuration steps, validate that the Administration Server has started successfully by making sure you have access to the Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control, which both are installed and configured on the Administration Servers.

10.6.1 Starting the Node Manager in the Administration Server Domain Home on WCCHOST1

Use these steps to start the per-domain Node Manager for the *ASERVER_HOME* domain directory.

1. Verify that the listen address in the `nodemanager.properties` file is set correctly.
 - a. Open the `nodemanager.properties` file for editing:
- b. Make sure the `ListenAddress` property is set to the value of the `ADMINVHN` virtual IP address.
- c. Make sure that `QuitEnabled` is set to 'true'. If this line is not present in the `nodemanager.properties` file, add the following line:

```
QuitEnabled=true
```

2. Change to the following directory:
3. Start the Node Manager by entering the following command:

```
nohup ./startNodeManager.sh > ASERVER_HOME/nodemanager/nodemanager.out 2>&1 &
```

For more information about additional Node Manager configuration options, see *Administering Node Manager for Oracle WebLogic Server*.

10.6.2 Creating the boot.properties File

You must create a `boot.properties` if you want to start the Administrator Server without being prompted for the Administrator Server credentials. This step is required in an enterprise deployment. The credentials you enter in this file are encrypted when you start the Administration Server.

To create a `boot.properties` file for the Administration Server:

1. Create the following directory structure:

```
mkdir -p ASERVER_HOME/servers/AdminServer/security
```

- In a text editor, create a file called `boot.properties` in the `security` directory created in the previous step, and enter the Administration Server credentials that you defined when you ran the Configuration Wizard to create the domain:

```
username=adminuser
password=password
```

Note:

When you start the Administration Server, the `username` and `password` entries in the file get encrypted.

For security reasons, minimize the amount of time the entries in the file are left unencrypted; after you edit the file, you should start the server as soon as possible so that the entries get encrypted.

- Save the file and close the editor.

10.6.3 Starting the Administration Server Using the Node Manager

After you have configured the domain and configured the Node Manager, you can start the Administration Server, using the Node Manager. In an enterprise Deployment, the Node Manager is used to start and stop the Administration Server and all the Managed Servers in the domain.

To start the Administration Server using the Node Manager:

- Start the WebLogic Scripting Tool (WLST):

```
cd ORACLE_COMMON_HOME/common/bin
./wlst.sh
```

- Connect to Node Manager using the Node Manager credentials:

```
wls:/offline>nmConnect('nodemanager_username','nodemanager_password',
'ADMINVHN','5556','domain_name',
'ASERVER_HOME')
```

Note:

This user name and password are used only to authenticate connections between Node Manager and clients. They are independent of the server administrator ID and password and are stored in the `nm_password.properties` file located in the following directory:

```
ASERVER_HOME/config/nodemanager
```

- Start the Administration Server:

```
nmStart('AdminServer')
```

Note:

When you start the Administration Server, it attempts to connect to Oracle Web Services Manager for WebServices policies. It is expected that, since the WSM-PM Managed Servers are not yet started, the following message will appear in the Administration Server log:

```
<Warning><oracle.wsm.resources.policymanager>  
<WSM-02141><Unable to connect to the policy access service due to Oracle WSM  
policy manager host server being down.>
```

4. Exit WLST:

```
exit()
```

10.6.4 Validating the Administration Server

Before proceeding with the configuration steps, validate that the Administration Server has started successfully by making sure you have access to the Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control, which both are installed and configured on the Administration Servers.

To navigate to Fusion Middleware Control, enter the following URL, and log in with the Oracle WebLogic Server administrator credentials:

```
ADMINVHN:7001/em
```

To navigate to the Oracle WebLogic Server Administration Console, enter the following URL, and log in with the same administration credentials:

```
ADMINVHN:7001/console
```

10.7 Creating a New LDAP Authenticator and Provisioning Enterprise Deployment Users and Group

When you configure an Oracle Fusion Middleware domain, the domain is configured by default to use the WebLogic Server authentication provider (`DefaultAuthenticator`). However, for an enterprise deployment, Oracle recommends that you use a dedicated, centralized LDAP-compliant authentication provider.

The following topics describe how to use the Oracle WebLogic Server Administration Console to create a new authentication provider for the enterprise deployment domain. This procedure assumes you have already installed and configured a supported LDAP directory, such as Oracle Unified Directory or Oracle Internet Directory.

[About the Supported Authentication Providers](#)

[About the Enterprise Deployment Users and Groups](#)

[Prerequisites for Creating a New Authentication Provider and Provisioning Users and Groups](#)

[Provisioning a Domain Connector User in the LDAP Directory](#)

[Creating the New Authentication Provider](#)

[Provisioning an Enterprise Deployment Administration User and Group](#)

[Adding the New Administration User to the Administration Group](#)

[Updating the boot.properties File and Restarting the System](#)

10.7.1 About the Supported Authentication Providers

Oracle Fusion Middleware supports a variety of LDAP authentication providers. For more information, see [Identity Store Types and WebLogic Authenticators](#) in *Securing Applications with Oracle Platform Security Services*.

The instructions in this guide assume you will be using one of the following providers:

- Oracle Unified Directory
- Oracle Internet Directory
- Oracle Virtual Directory

Note:

By default, the instructions here describe how to configure the identity service instance to support querying against a single LDAP identity store with an unencrypted connection.

If the connection to your identity provider has to be secured through SSL, then additional keystone configuration is required for role management in the Enterprise Manager Fusion Middleware Control to function correctly. For additional configuration information, see Doc ID 1670789.1 at support.oracle.com.

Also, you can configure the service to support a virtualized identity store, which queries multiple LDAP identity stores, by using LibOVD.

For more information about configuring a Multi-LDAP lookup, refer to [Configuring the Identity Store Service](#) in *Securing Applications with Oracle Platform Security Services*.

10.7.2 About the Enterprise Deployment Users and Groups

The following topics provide important information on the purpose and characteristics of the enterprise deployment administration users and groups.

[About Using Unique Administration Users for Each Domain](#)

[About the Domain Connector User](#)

[About Adding Users to the Central LDAP Directory](#)

[About Product-Specific Roles and Groups for Oracle WebCenter Content](#)

[Example Users and Roles Used in This Guide](#)

10.7.2.1 About Using Unique Administration Users for Each Domain

When you use a central LDAP user store, you can provision users and groups for use with multiple Oracle WebLogic Server domains. As a result, there is a possibility that

one WebLogic administration user can have access to all the domains within an enterprise.

Such an approach is not recommended. Instead, it is a best practice to assign a unique distinguished name (DN) within the directory tree for the users and groups you provision for the administration of your Oracle Fusion Middleware domains.

For example, if you plan to install and configure an Oracle WebCenter Content enterprise deployment domain, then create a user called **weblogic_wcc** and an administration group called **WCCAdministrators**.

10.7.2.2 About the Domain Connector User

Oracle recommends that you create a separate domain connector user (for example, **wccLDAP**) in your LDAP directory. This user allows the domain to connect to the LDAP directory for the purposes of user authentication. It is recommended that this user be a non-administrative user.

In a typical Oracle Identity and Access Management deployment, you create this user in the `systemids` container. This container is used for system users that are not normally visible to users. Placing the user into the `systemids` container ensures that customers who have Oracle Identity Manager do not reconcile this user.

10.7.2.3 About Adding Users to the Central LDAP Directory

After you configure a central LDAP directory to be the authenticator for the enterprise domain, then you should add all new users to the new authenticator and not to the default WebLogic Server authenticator.

To add new users to the central LDAP directory, you cannot use the WebLogic Administration Console. Instead, you must use the appropriate LDAP modification tools, such as `ldapbrowser` or `JXplorer`.

When you are using multiple authenticators (a requirement for an enterprise deployment), login and authentication will work, but role retrieval will not. The role is retrieved from the first authenticator only. If you want to retrieve roles using any other authenticator, then you must enable virtualization for the domain.

To enable virtualization:

1. Locate and open the following configuration file with a text editor:

```
ASERVER_HOME/config/fmwconfig/jps-config.xml
```

2. Find the following section:

```
<serviceInstance name="idstore.ldap" provider="idstore.ldap.provider">
```

3. Add the following line under the `serviceInstance` section or update the `virtualize` property as follows:

```
<property name="virtualize" value="true"/>
```

For more information about the `virtualize` property, see *OPSS System and Configuration Properties* in *Securing Applications with Oracle Platform Security Services*.

10.7.2.4 About Product-Specific Roles and Groups for Oracle WebCenter Content

Each Oracle Fusion Middleware product implements its own predefined roles and groups for administration and monitoring.

As a result, as you extend the domain to add additional products, you can add these product-specific roles to the `WCCAdministrators` group. After they are added to the `WCCAdministrators` group, each product administrator user can administer the domain with the same set of privileges for performing administration tasks.

Instructions for adding additional roles to the `WCCAdministrators` group are provided in [Common Configuration and Management Tasks for an Enterprise Deployment](#).

10.7.2.5 Example Users and Roles Used in This Guide

In this guide, the examples assume that you provision the following administration user and group with the DNs shown below:

- Admin User DN:

```
cn=weblogic_wcc,cn=users,dc=example,dc=com
```

- Admin Group DN:

```
cn=WCCAdministrators,cn=groups,dc=example,dc=com
```

- Product-specific LDAP Connector User:

```
cn=wccLDAP,cn=systemids,dc=example,dc=com
```

This is the user you will use to connect WebLogic Managed Servers to the LDAP authentication provider. This user must have permissions to read and write to the Directory Trees:

```
cn=users,dc=example,dc=com
cn=groups,dc=example,dc=com
```

Note:

When using Oracle Unified Directory, this user will need to be granted membership in the following groups to provide read and write access:

```
cn=orclFAUserReadPrivilegeGroup,cn=groups,dc=example,dc=com
cn=orclFAUserWritePrivilegeGroup,cn=groups,dc=example,dc=com
cn=orclFAGroupReadPrivilegeGroup,cn=groups,dc=example,dc=com
cn=orclFAGroupWritePrivilegeGroup,cn=groups,dc=example,dc=com
```

10.7.3 Prerequisites for Creating a New Authentication Provider and Provisioning Users and Groups

Before you create a new LDAP authentication provider, back up the relevant configuration files:

```
ASERVER_HOME/config/config.xml
ASERVER_HOME/config/fmwconfig/jps-config.xml
ASERVER_HOME/config/fmwconfig/system-jazn-data.xml
```

In addition, back up the `boot.properties` file for the Administration Server in the following directory:

```
ASERVER_HOME/servers/AdminServer/security
```

10.7.4 Provisioning a Domain Connector User in the LDAP Directory

This example shows how to create a user called `wcLDAP` in the central LDAP directory.

To provision the user in the LDAP provider:

1. Create an ldif file named `domain_user.ldif` with the contents shown below and then save the file:

```
dn: cn=wcLDAP,cn=systemids,dc=example,dc=com
changetype: add
orclsamaccountname: wcLDAP
userpassword: password
objectclass: top
objectclass: person
objectclass: organizationalPerson
objectclass: inetorgperson
objectclass: orcluser
objectclass: orcluserV2
mail: wcLDAP@example.com
givenname: wcLDAP
sn: wcLDAP
cn: wcLDAP
uid: wcLDAP
```

Note:

If you are using Oracle Unified Directory, then add the following four group memberships to the end of the LDIF file to grant the appropriate read/write privileges:

```
dn:
cn=orclFAUserReadPrivilegeGroup,cn=groups,dc=example,dc=com
changetype: modify
add: uniquemember
uniquemember: cn=wcLDAP,cn=systemids,dc=example,dc=com

dn: cn=orclFAGroupReadPrivilegeGroup,cn=groups,dc=example,dc=com
changetype: modify
add: uniquemember
uniquemember: cn=wcLDAP,cn=systemids,dc=example,dc=com

dn: cn=orclFAUserWritePrivilegeGroup,cn=groups,dc=example,dc=com
changetype: modify
add: uniquemember
uniquemember: cn=wcLDAP,cn=systemids,dc=example,dc=com

dn: cn=orclFAGroupWritePrivilegeGroup,cn=groups,dc=example,dc=com
changetype: modify
add: uniquemember
uniquemember: cn=wcLDAP,cn=systemids,dc=example,dc=com
```

2. Provision the user in the LDAP directory.

For example, for an Oracle Unified Directory LDAP provider:

```

OID_INSTANCE_HOME/bin/ldapmodify -a \
    -h oudhost.example.com
    -D "cn=oudadmin" \
    -w password \
    -p 1389 \
    -f domain_user.ldif
    
```

For Oracle Internet Directory:

```

OID_ORACLE_HOME/bin/ldapadd -h oidhost.example.com \
    -p 3060 \
    -D cn="orcladmin" \
    -w password \
    -c \
    -v \
    -f domain_user.ldif
    
```

10.7.5 Creating the New Authentication Provider

To configure a new LDAP-based authentication provider:

1. Log in to the WebLogic Server Administration Console.
2. Click **Security Realms** in the left navigational bar.
3. Click the **myrealm** default realm entry.
4. Click the **Providers** tab.

Note that there is a `DefaultAuthenticator` provider configured for the realm. This is the default WebLogic Server authentication provider.

<input type="checkbox"/>	Name	Description	Version
<input type="checkbox"/>	Trust Service Identity Asserter	Trust Service Identity Assertion Provider	1.0
<input type="checkbox"/>	DefaultAuthenticator	WebLogic Authentication Provider	1.0
<input type="checkbox"/>	DefaultIdentityAsserter	WebLogic Identity Assertion provider	1.0

5. Click **Lock & Edit** in the Change Center.
6. Click the **New** button below the **Authentication Providers** table.
7. Enter a name for the provider.

Use one of the following names, based on the LDAP directory service you are planning to use as your credential store:

- `OUDAuthenticator` for Oracle Unified Directory
 - `OIDAAuthenticator` for Oracle Internet Directory
 - `OVDAuthenticator` for Oracle Virtual Directory
8. Select the authenticator type from the **Type** drop-down list.

Select one of the following types, based on the LDAP directory service you are planning to use as your credential store:

- OracleUnifiedDirectoryAuthenticator for Oracle Unified Directory
 - OracleInternetDirectoryAuthenticator for Oracle Internet Directory
 - OracleVirtualDirectoryAuthenticator for Oracle Virtual Directory
9. Click **OK** to return to the Providers screen.
 10. On the Providers screen, click the newly created authenticator in the table.
 11. Select **SUFFICIENT** from the **Control Flag** drop-down menu.



Setting the control flag to **SUFFICIENT** indicates that if the authenticator can successfully authenticate a user, then the authenticator should accept that authentication and should not continue to invoke any additional authenticators.

If the authentication fails, it will fall through to the next authenticator in the chain. Make sure all subsequent authenticators also have their control flags set to **SUFFICIENT**; in particular, check the **DefaultAuthenticator** and make sure that its control flag is set to **SUFFICIENT**.

12. Click **Save** to save the control flag settings.
13. Click the **Provider Specific** tab and enter the details specific to your LDAP server, as shown in the following table.

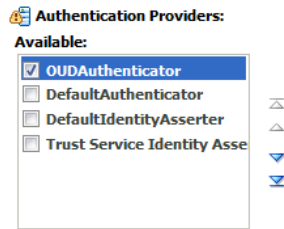
Note that only the required fields are discussed in this procedure. For information about all the fields on this page, consider the following resources:

- To display a description of each field, click **Help** on the **Provider Specific** tab.
- For more information on setting the **User Base DN**, **User From Name Filter**, and **User Attribute** fields, see *Configuring Users and Groups in the Oracle Internet Directory and Oracle Virtual Directory Authentication Providers in Oracle Fusion Middleware Administering Security for Oracle WebLogic Server*.

Parameter	Sample Value	Value Description
Host	For example: <code>oud.example.com</code>	The LDAP server's server ID.
Port	For example: 1689	The LDAP server's port number.
Principal	For example: <code>cn=wccLDAP, cn=systemids, dc=example, dc=com</code>	The LDAP user DN used to connect to the LDAP server.
Credential	Enter LDAP password.	The password used to connect to the LDAP server.
SSL Enabled	Unchecked (clear)	Specifies whether SSL protocol is used when connecting to the LDAP server.
User Base DN	For example: <code>cn=users, dc=example, dc=com</code>	Specify the DN under which your users start.

Parameter	Sample Value	Value Description
All Users Filter	<code>(&(uid=*)(objectclass=person))</code>	<p>Instead of a default search criteria for All Users Filter, search all users based on the <code>uid</code> value.</p> <p>If the User Name Attribute for the user object class in the LDAP directory structure is a type other than <code>uid</code>, then change that type in the User From Name Filter field.</p> <p>For example, if the User Name Attribute type is <code>cn</code>, then this field should be set to:</p> <pre>(&(cn=*)(objectclass=person))</pre>
User From Name Filter	<p>For example:</p> <pre>(&(uid=%u)(objectclass=person))</pre>	<p>If the User Name Attribute for the user object class in the LDAP directory structure is a type other than <code>uid</code>, then change that type in the settings for the User From Name Filter.</p> <p>For example, if the User Name Attribute type is <code>cn</code>, then this field should be set to:</p> <pre>(&(cn=%u)(objectclass=person)).</pre>
User Name Attribute	For example: <code>uid</code>	The attribute of an LDAP user object that specifies the name of the user.
Group Base DN	For example: <code>cn=groups,dc=example,dc=com</code>	Specify the DN that points to your Groups node.
Use Retrieved User Name as Principal	Checked	Must be turned on.
GUID Attribute	<code>entryuuid</code>	This value is prepopulated with <code>entryuuid</code> when <code>OracleUnifiedDirectoryAuthenticator</code> is used for OUD. Check this value if you are using Oracle Unified Directory as your authentication provider.

14. Click **Save** to save the changes.
15. Return to the Providers page by clicking **Security Realms** in the right navigation pane, clicking the default realm name (**myrealm**), and then **Providers**.
16. Click **Reorder**, and then use the resulting page to make the Provider you just created first in the list of authentication providers.



17. Click **OK**.
18. In the Change Center, click **Activate Changes**.
19. Restart the Administration Server.

To stop and start the Administration Server using the Node Manager:

- a. Start WLST:

```
cd ORACLE_COMMON_HOME/common/bin
./wlst.sh
```

- b. Connect to Node Manager using the Node Manager credentials you defined in when you created the domain in the Configuration Wizard:

```
wls:/offline>nmConnect('nodemanager_username','nodemanager_password',
                      'ADMINVHN','5556','domain_name',
                      'ASERVER_HOME')
```

- c. Stop the Administration Server:

```
nmKill('AdminServer')
```

- d. Start the Administration Server:

```
nmStart('AdminServer')
```

- e. Exit WLST:

```
exit()
```

20. After the restart, review the contents of the following log file:

```
ASERVER_HOME/servers/AdminServer/logs/AdminServer.log
```

Verify that no LDAP connection errors occurred. For example, look for errors such as the following:

```
The LDAP authentication provider named "OUDAuthenticator" failed to make
connection to ldap server at ...
```

If you see such errors in the log file, then check the authorization provider connection details to verify they are correct and try saving and restarting the Administration Server again.

21. After you restart and verify that no LDAP connection errors are in the log file, try browsing the users and groups that exist in the LDAP provider:

In the Administration Console, navigate to the **Security Realms > myrealm > Users and Groups** page. You should be able to see all users and groups that exist in the LDAP provider structure.

10.7.6 Provisioning an Enterprise Deployment Administration User and Group

This example shows how to create a user called **weblogic_wcc** and a group called **WCCAdministrators**.

To provision the administration user and group in LDAP provider:

1. Create an ldif file named `admin_user.ldif` with the contents shown below and then save the file:

```
dn: cn=weblogic_wcc,cn=users,dc=example,dc=com
changetype: add
orclsamaccountname: weblogic_wcc
userpassword: password
objectclass: top
objectclass: person
objectclass: organizationalPerson
objectclass: inetorgperson
objectclass: orcluser
objectclass: orcluserV2
mail: weblogic_wcc@example.com
givenname: weblogic_wcc
sn: weblogic_wcc
cn: weblogic_wcc
uid: weblogic_wcc
```

2. Provision the user in the LDAP directory.

For example, for an Oracle Unified Directory LDAP provider:

```
OID_INSTANCE_HOME/bin/ldapmodify -a \
    -h oudhost.example.com
    -D "cn=oudadmin" \
    -w password \
    -p 1389 \
    -f admin_user.ldif
```

For Oracle Internet Directory:

```
OID_ORACLE_HOME/bin/ldapadd -h oidhost.example.com \
    -p 3060 \
    -D cn="orcladmin" \
    -w password \
    -c \
    -v \
    -f admin_user.ldif
```

3. Create an ldif file named `admin_group.ldif` with the contents shown below and then save the file:

```
dn: cn=WCCAdministrators,cn=Groups,dc=example,dc=com
displayname: WCCAdministrators
objectclass: top
objectclass: groupOfUniqueNames
objectclass: orclGroup
uniquemember: cn=weblogic_wcc,cn=users,dc=example,dc=com
cn: WCCAdministrators
uniquemember: cn=wccLDAP,cn=systemids,dc=example,dc=com
cn: WCCAdministrators
description: Administrators Group for the Oracle WebCenter Content Domain
```

4. Provision the group in the LDAP Directory.

For Oracle Unified Directory:

```

OULD_INSTANCE_HOME/bin/ldapmodify -a \
-D "cn=oudadmin" \
-h oudhost.example.com \
-w password \
-p 1380 \
-f admin_group.ldif
    
```

For Oracle Internet Directory:

```

OID_ORACLE_HOME/bin/ldapadd -h oid.example.com \
-p 3060 \
-D cn="orcladmin" \
-w password \
-c \
-v \
-f admin_group.ldif
    
```

5. Verify that the changes were made successfully:

- a. Log in to the Oracle WebLogic Server Administration Console.
- b. In the left pane of the console, click **Security Realms**.
- c. Click the default security realm (**myrealm**).
- d. Click the **Users and Groups** tab.
- e. Verify that the administrator user and group you provisioned are listed on the page.

10.7.7 Adding the New Administration User to the Administration Group

After adding the users and groups to Oracle Internet Directory, the group must be assigned the Administration role within the WebLogic domain security realm. This enables all users that belong to the group to be administrators for the domain.

To assign the Administration role to the new enterprise deployment administration group:

1. Log in to the WebLogic Administration Server Console using the administration credentials that you provided in the Configuration Wizard.

Do not use the credentials for the administration user you created and provided for the new authentication provider.

2. In the left pane of the Administration Console, click **Security Realms**.
3. Click the default security realm (**myrealm**).
4. Click the **Roles and Policies** tab.
5. Expand the **Global Roles** entry in the table and click **Roles**.

[-] Domain
[-] Global Roles
[-] Roles
[-] JCOM

6. Click the **Admin** role.

[-] Role Name ^	Provider Name
Admin	XACMLRoleMapper

7. Click **Add conditions**.

8. Select **Group** from the **Predicate List** drop-down menu, and then click **Next**.

9. Enter `WCCAdministrators` in the **Group Argument Name** field, and then click **Add**.

`WCCAdministrators` is added to the list box of arguments.

10. Click **Finish** to return to the Edit Global Role page.

The `WCCAdministrators` group is now listed.

11. Click **Save** to finish adding the **Admin** Role to the `WCCAdministrators` group.

12. Validate that the changes were made by logging in to the WebLogic Administration Server Console using the new `weblogic_wcc` user credentials.

If you can log in to the Oracle WebLogic Server Administration Console and Fusion Middleware Control with the credentials of the new administration user you just provisioned in the new authentication provider, then you have configured the provider successfully.

10.7.8 Updating the `boot.properties` File and Restarting the System

After you create the new administration user and group, you must update the Administration Server `boot.properties` file with the administration user credentials that you created in the LDAP directory:

1. On `WCCHOST1`, go the following directory:

```
ASERVER_HOME/servers/AdminServer/security
```

2. Rename the existing `boot.properties` file:

```
mv boot.properties boot.properties.backup
```

3. Use a text editor to create a file called `boot.properties` under the security directory.

4. Enter the following lines in the file:

```
username=weblogic_wcc
password=password
```

5. Save the file.
6. Restart the Administration Server.

Configuring the Web Tier for an Enterprise Deployment

It is important to understand how to install and configure a standalone Oracle HTTP Server domain that contains two Oracle HTTP Server instances: one on WEBHOST1 and one on WEBHOST2.

This chapter provides information on variables used when configuring the web tier and installing and configuring a web tier domain.

Variables Used When Configuring the Web Tier

While configuring the web tier, you will be referencing the directory variables listed in this section.

About the Web Tier Domains

In an enterprise deployment, each Oracle HTTP Server instance is configured on a separate host and in its own standalone domain. This allows for a simple configuration that requires a minimum amount of configuration and a minimum amount of resources to run and maintain.

Installing Oracle HTTP Server on WEBHOST1

It is important to understand the procedure for installing the Oracle HTTP Server software on the web tier.

Creating a Web Tier Domain on WEBHOST1

It is essential to understand how to create a new Oracle HTTP Server standalone domain on the first Web tier host.

Installing and Configuring a Web Tier Domain on WEBHOST2

After you install Oracle HTTP Server and configure a Web Tier domain on WEBHOST1, then you must also perform the same tasks on WEBHOST2.

Starting the Node Manager and Oracle HTTP Server Instances on WEBHOST1 and WEBHOST2

It is important to understand how to start the Oracle HTTP Server instances on WEBHOST1 and WEBHOST2.

Configuring Oracle HTTP Server to Route Requests to the Application Tier

It is important to understand how to update the Oracle HTTP Server configuration files so that the web server instances route requests to the servers in the domain.

11.1 Variables Used When Configuring the Web Tier

While configuring the web tier, you will be referencing the directory variables listed in this section.

The values for several directory variables are defined in [File System and Directory Variables Used in This Guide](#).

- `OHS_ORACLE_HOME`
- `OHS_DOMAIN_HOME`

In addition, you'll be referencing the following virtual IP (VIP) address and host names:

- ADMINVHN
- WEBHOST1
- WEBHOST2

11.2 About the Web Tier Domains

In an enterprise deployment, each Oracle HTTP Server instance is configured on a separate host and in its own standalone domain. This allows for a simple configuration that requires a minimum amount of configuration and a minimum amount of resources to run and maintain.

For more information about the role and configuration of the Oracle HTTP Server instances in the web tier, see [Understanding the Web Tier](#).

11.3 Installing Oracle HTTP Server on WEBHOST1

It is important to understand the procedure for installing the Oracle HTTP Server software on the web tier.

[Starting the Installer on WEBHOST1](#)

[Navigating the Oracle HTTP Server Installation Screens](#)

[Verifying the Oracle HTTP Server Installation](#)

11.3.1 Starting the Installer on WEBHOST1

To start the installation program, perform the following steps.

1. Log in to WEBHOST1.
2. Go to the directory in which you downloaded the installation program.
3. Launch the installation program by entering the following command:

```
./fmw_12.2.1.2.0_ohs_linux64.bin
```

When the installation program appears, you are ready to begin the installation.

11.3.2 Navigating the Oracle HTTP Server Installation Screens

The following table lists the screens in the order that the installation program displays them.

If you need additional help with any of the installation screens, click the screen name.

Table 11-1 Oracle HTTP Server Installation Screens

Screen	Description
Welcome	This screen introduces you to the product installer.
Auto Updates	Use this screen to automatically search My Oracle Support for available patches or automatically search a local directory for patches that you've already downloaded for your organization.
Installation Location	Use this screen to specify the location of your Oracle home directory. For the purposes of an enterprise deployment, enter the value of the OHS_ORACLE_HOME variable listed in Table 7-3 .
Installation Type	Select Standalone HTTP Server (Managed independently of WebLogic server) . This installation type allows you to configure the Oracle HTTP Server instances independently from any other existing Oracle WebLogic Server domains.
Prerequisite Checks	This screen verifies that your system meets the minimum necessary requirements. If there are any warning or error messages, verify that your host computers and the required software meet the system requirements and certification information described in Host Computer Hardware Requirements and Operating System Requirements for the Enterprise Deployment Topology .
Security Updates	If you already have an Oracle Support account, use this screen to indicate how you would like to receive security updates. If you do not have an account, or if you are sure you want to skip this step, then clear the check box and verify your selection in the follow-up dialog box.
Installation Summary	Use this screen to verify the installation options you selected. 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. Response files can be used later in a silent installation situation. For more information about silent or command line installation, see <i>Using the Oracle Universal Installer in Silent Mode in Oracle Fusion Middleware Installing Software with the Oracle Universal Installer</i> .
Installation Progress	This screen allows you to see the progress of the installation.

Table 11-1 (Cont.) Oracle HTTP Server Installation Screens

Screen	Description
Installation Complete	This screen appears when the installation is complete. Review the information on this screen, then click Finish to close the installer.

11.3.3 Verifying the Oracle HTTP Server Installation

To verify that your Oracle HTTP Server installation completed successfully, list files that were installed in the new Oracle home directory. You should see the following directories in the Oracle HTTP Server Oracle home:

```
ldap
ohs
srm
has
css
crs
nls
oracore
precomp
rdbms
plsq
jlib
slax
sqlplus
xdk
oracle_common
webgate
bin
wlserver
OPatch
plugins
oui
perl
network
lib
oraInst.loc
install
cfgtoollogs
inventory
```

11.4 Creating a Web Tier Domain on WEBHOST1

It is essential to understand how to create a new Oracle HTTP Server standalone domain on the first Web tier host.

[Starting the Configuration Wizard on WEBHOST1](#)

[Navigating the Configuration Wizard Screens for an Oracle HTTP Server Domain](#)

11.4.1 Starting the Configuration Wizard on WEBHOST1

To start the Configuration Wizard, navigate to the following directory and start the WebLogic Server Configuration Wizard, as follows:

```
cd OHS_ORACLE_HOME/oracle_common/common/bin
./config.sh
```

11.4.2 Navigating the Configuration Wizard Screens for an Oracle HTTP Server Domain

Oracle recommends that you create a standalone domain for the Oracle HTTP Server instances on each Web tier host.

The following topics describe how to create a new standalone Oracle HTTP Server domain:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Templates"](#)
- [Task 3, "Selecting the JDK for the Web Tier Domain."](#)
- [Task 4, "Configuring System Components"](#)
- [Task 5, "OHS Server Screen"](#)
- [Task 7, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 8, "Writing Down Your Domain Home"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Create a new domain**.

In the **Domain Location** field, enter the value assigned to the OHS_DOMAIN_HOME variable.

Note the following:

- The Configuration Wizard will create the new directory that you specify here.
- Create the directory on local storage, so the web servers do not have any dependencies on on storage devices outside the DMZ.

Task 2 Selecting the Configuration Templates

On the Templates screen, select **Oracle HTTP Server (Standalone) - 12.2.1.2.0 [ohs]**.

Tip:

More information about the options on this screen can be found in Templates in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Selecting the JDK for the Web Tier Domain.

Select the Oracle Hotspot JDK, which was installed in the Web tier Oracle home when you installed the Oracle HTTP Server software.

Task 4 Configuring System Components

On the System Components screen, configure one Oracle HTTP Server instance. The screen should by default have a single instance defined. This is the only instance you need to create.

1. Note that the default instance name is `ohs1` in the **System Component** field. You use this default name.
2. Make sure OHS is selected in the **Component Type** field.
3. Use the **Restart Interval Seconds** field to specify the number of seconds to wait before attempting a restart if an application is not responding.
4. Use the **Restart Delay Seconds** field to specify the number of seconds to wait between restart attempts.

Task 5 OHS Server Screen

Use the OHS Server screen to configure the OHS servers in your domain:

1. Select `ohs1` from the **System Component** drop-down menu.
2. In the **Listen Address** field, enter `WEBHOST1`.
All of the remaining fields are pre-populated, but you can change the values as required for your organization. For more information about the fields on this screen, see OHS Server in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.
3. In the **Server Name** field, verify the value of the listen address and listen port.

It should appear as follows:

```
http://WEBHOST1:7777
```

Task 6 Configuring Node Manager

Select **Per Domain Default Location** as the Node Manager type, and specify the user name and password for the Node Manager.

Note:

For more information about the options on this screen, see Node Manager in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

For additional information, see Configuring Node Manager on Multiple Machines in *Oracle Fusion Middleware Administering Node Manager for Oracle WebLogic Server*.

Task 7 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 8 Writing Down Your Domain Home

The Configuration Success screen will show the domain home location.

Make a note of the information provided here, as you will need it to start the servers and access the Administration Server.

Click **Finish** to close the Configuration Wizard.

11.5 Installing and Configuring a Web Tier Domain on WEBHOST2

After you install Oracle HTTP Server and configure a Web Tier domain on WEBHOST1, then you must also perform the same tasks on WEBHOST2.

1. Log in to WEBHOST2 and install Oracle HTTP Server, using the instructions in [Installing Oracle HTTP Server on WEBHOST1](#).
2. Configure a new standalone domain on WEBHOST2, using the instructions in [Creating a Web Tier Domain on WEBHOST1](#).

Use the name `ohs2` for the instance on WEBHOST2, and be sure to replace all occurrences of WEBHOST1 with WEBHOST2 and all occurrences of `ohs1` with `ohs2` in each of the examples.

11.6 Starting the Node Manager and Oracle HTTP Server Instances on WEBHOST1 and WEBHOST2

It is important to understand how to start the Oracle HTTP Server instances on WEBHOST1 and WEBHOST2.

[Starting the Node Manager on WEBHOST1 and WEBHOST2](#)

[Starting the Oracle HTTP Server Instances](#)

11.6.1 Starting the Node Manager on WEBHOST1 and WEBHOST2

Before you can start the Oracle HTTP Server instances, you must start the Node Manager on WEBHOST1 and WEBHOST2:

1. Log in to WEBHOST1 and navigate to the following directory:

```
OHS_DOMAIN_HOME/bin
```

2. Start the Node Manager as shown below, using `nohup` and `nodemanager.out` as an example output file:

```
nohup OHS_DOMAIN_HOME/bin/startNodeManager.sh > OHS_DOMAIN_HOME/nodemanager/nodemanager.out 2>&1 &
```

3. Log in to WEBHOST2 and perform steps 1 and 2.

For more information about additional Node Manager configuration options, see *Advanced Node Manager Configuration in Oracle Fusion Middleware Administering Node Manager for Oracle WebLogic Server*.

11.6.2 Starting the Oracle HTTP Server Instances

To start the Oracle HTTP Server instances:

1. Navigate to the following directory on WEBHOST1:

```
OHS_DOMAIN_HOME/bin
```

For more information about the location of the OHS_DOMAIN_HOME directory, see [File System and Directory Variables Used in This Guide](#).

2. Enter the following command:

```
./startComponent.sh ohs1
```

3. When prompted, enter the Node Manager password.
4. Repeat steps 1 through 3 to start the ohs2 instance on WEBHOST2.

For more information, see *Starting Oracle HTTP Server Instances in Administering Oracle HTTP Server*.

11.7 Configuring Oracle HTTP Server to Route Requests to the Application Tier

It is important to understand how to update the Oracle HTTP Server configuration files so that the web server instances route requests to the servers in the domain.

[About the Oracle HTTP Server Configuration for an Enterprise Deployment](#)

[Modifying the httpd.conf File to Include Virtual Host Configuration Files](#)

[Creating the Virtual Host Configuration Files](#)

[Validating the Virtual Server Configuration on the Load Balancer](#)

[Configuring Routing to the Administration Server](#)

[Turning On the WebLogic Server Plug-In Enabled Flag](#)

[Setting the Front-End URL for the Administration Console and Setting Redirection Preferences](#)

[Validating Access to the Management Consoles and Administration Server](#)

11.7.1 About the Oracle HTTP Server Configuration for an Enterprise Deployment

The following topics provide overview information about the changes required to the Oracle HTTP Server configuration in an enterprise deployment.

[Purpose of the Oracle HTTP Server Virtual Hosts](#)

[Recommended Structure of the Oracle HTTP Server Configuration Files](#)

11.7.1.1 Purpose of the Oracle HTTP Server Virtual Hosts

The reference topologies in this guide require that you define a set of virtual servers on the hardware load balancer. You can then configure Oracle HTTP Server to recognize requests to specific virtual hosts (that map to the load balancer virtual servers) by adding `<VirtualHost>` directives to the Oracle HTTP Server instance configuration files.

For each Oracle HTTP Server virtual host, you define a set of specific URLs (or context strings) that route requests from the load balancer through the Oracle HTTP Server instances to the appropriate Administration Server or Managed Server in the Oracle WebLogic Server domain.

11.7.1.2 Recommended Structure of the Oracle HTTP Server Configuration Files

Rather than adding multiple virtual host definitions to the `httpd.conf` file, Oracle recommends that you create separate, smaller, and more specific configuration files for each of the virtual servers required for the products you are deploying. This avoids populating an already large `httpd.conf` file with additional content, and it can make troubleshooting configuration problems easier.

For example, in a typical Oracle Fusion Middleware Infrastructure domain, you can add a specific configuration file called `admin_vh.conf` that contains the virtual host definition for the Administration Server virtual host (ADMINVHN).

11.7.2 Modifying the `httpd.conf` File to Include Virtual Host Configuration Files

Perform the following tasks to prepare the `httpd.conf` file for the additional virtual hosts required for an enterprise topology:

1. Log in to WEBHOST1.
2. Locate the `httpd.conf` file for the first Oracle HTTP Server instance (`ohs1`) in the domain directory:

```
cd OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs1/
```

3. Open the `httpd.conf` file in a text editor and make the following changes:
 - a. Create a `ServerName` entry in the Virtual Hosts section of the `httpd.conf` file, below the `# Virtual Hosts` comment block and before the `# VirtualHost` Example: comment as follows:

```
##### Virtual hosts #####

# Virtual Hosts
#
# If you want to maintain multiple domains/hostnames on your
# machine you can setup VirtualHost containers for them. Most configurations
# use only name-based virtual hosts so the server doesn't need to worry
# about
# IP addresses. This is indicated by the asterisks in the directives below.
#
# Please see the documentation at
# URL
# for further details before you try to setup virtual hosts.

ServerName http://WEBHOST1:7777
```

```
#
# VirtualHost example:
```

In this example, replace WEBHOST1 with the value of the WEBHOST1 variable. For more information, see [File System and Directory Variables Used in This Guide](#).

- b. Verify that there is an `INCLUDE` statement in the `httpd.conf` that includes all `*.conf` files in the `moduleconf` subdirectory:

```
IncludeOptional "moduleconf/*.conf"
```

This statement makes it possible to create the separate virtual host files for each component, making it easier to update, maintain, and scale out the virtual host definitions.

4. Save the `httpd.conf` file.
5. Log in to WEBHOST2 and perform steps 2 through 4 to update the `httpd.conf` file for the `ohs2` instance.

On WEBHOST2, replace all instances of WEBHOST1 with WEBHOST2 and all instances of `ohs1` with `ohs2`.

11.7.3 Creating the Virtual Host Configuration Files

To create the virtual host configuration files:

Note: Before you create the virtual host configuration files, be sure you have configured the virtual servers on the load balancer, as described in [Purpose of the Oracle HTTP Server Virtual Hosts](#).

1. Log in to WEBHOST1 and change directory to the configuration directory for the first Oracle HTTP Server instance (`ohs1`):

```
cd OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs1/moduleconf
```

2. Create the `admin_vh.conf` file and add the following directive:

```
<VirtualHost WEBHOST1:7777>
  ServerName admin.example.com:80
  ServerAdmin you@your.address
  RewriteEngine On
  RewriteOptions inherit
</VirtualHost>
```

3. Create the `wccinternal_vh.conf` file and add the following directive:

```
<VirtualHost WEBHOST1:7777>
  ServerName wccinternal.example.com:80
  ServerAdmin you@your.address
  RewriteEngine On
  RewriteOptions inherit
</VirtualHost>
```

4. Restart the `ohs1` instance:
 - a. Change directory to the following location:

```
cd OHS_DOMAIN_HOME/bin
```

- b. Enter the following commands to stop and start the instance; provide the node manager password when prompted:

```
./stopComponent.sh ohs1
./startComponent.sh ohs1
```

5. Copy the `admin_vh.conf` file and the `wccinternal_vh.conf` file to the configuration directory for the second Oracle HTTP Server instance (`ohs2`) on `WEBHOST2`:

```
OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs2/moduleconf
```

6. Edit the `admin_vh.conf` and `wccinternal_vh.conf` files and change any references from `WEBHOST1` to `WEBHOST2` in the `<VirtualHost>` directives.
7. Restart the `ohs2` instance:

- a. Change directory to the following location:

```
cd OHS_DOMAIN_HOME/bin
```

- b. Enter the following commands to stop and start the instance:

```
./stopComponent.sh ohs2
./startComponent.sh ohs2
```

11.7.4 Validating the Virtual Server Configuration on the Load Balancer

From the load balancer, access the following URLs to ensure that your load balancer and Oracle HTTP Server are configured properly. These URLs should show the initial Oracle HTTP Server 12c web page.

- <http://admin.example.com/index.html>
- <http://wccinternal.example.com/index.html>

11.7.5 Configuring Routing to the Administration Server

To enable Oracle HTTP Server to route to the Administration Server, you must add a set of `<Location>` directives to the Oracle HTTP Server `admin_vh.conf` configuration file:

1. Log in to `WEBHOST1`, and change directory to the following location:

```
cd OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs1/moduleconf/
```

2. Add the following directives to the `admin_vh.conf` file within the `<VirtualHost>` tags:

```
# Admin Server and EM
<Location /console>
    SetHandler weblogic-handler
    WebLogicHost ADMINVHN
    WebLogicPort 7001
</Location>

<Location /consolehelp>
    SetHandler weblogic-handler
    WebLogicHost ADMINVHN
```

```

        WeblogicPort 7001
    </Location>

    <Location /em>
        SetHandler weblogic-handler
        WebLogicHost ADMINVHN
        WeblogicPort 7001
    </Location>

```

The `admin_vh.conf` file should appear as it does in [Example 11-1](#).

3. Restart the ohs1 instance:

a. Change directory to the following location:

```
cd OHS_DOMAIN_HOME/bin
```

b. Enter the following commands to stop and start the instance:

```
./stopComponent.sh ohs1
./startComponent.sh ohs1
```

4. Copy the `admin_vh.conf` file to the configuration directory for the second Oracle HTTP Server instance (ohs2) on WEBHOST2:

```
OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs2/moduleconf/
```

5. Edit the `admin_vh.conf` file and change any references of WEBHOST1 to WEBHOST2 in the `<VirtualHost>` directives.

6. Restart the ohs2 instance:

a. Change directory to the following location:

```
cd OHS_DOMAIN_HOME/bin
```

b. Enter the following commands to stop and start the instance:

```
./stopComponent.sh ohs2
./startComponent.sh ohs2
```

Example 11-1 Sample Contents of the `admin_vh.conf` File

```

<VirtualHost WEBHOST1:7777>
    ServerName admin.example.com:7777
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit

# Admin Server and EM
<Location /console>
    SetHandler weblogic-handler
    WebLogicHost ADMINVHN
    WeblogicPort 7001
</Location>

<Location /consolehelp>
    SetHandler weblogic-handler
    WebLogicHost ADMINVHN
    WeblogicPort 7001
</Location>

```

```

<Location /em>
  SetHandler weblogic-handler
  WebLogicHost ADMINVHN
  WeblogicPort 7001
</Location>
</VirtualHost>

```

11.7.6 Turning On the WebLogic Server Plug-In Enabled Flag

For security purposes, and since the load balancer terminates SSL requests (Oracle HTTP Server routes the requests as non-SSL to WebLogic Server), once you configure SSL for the load balancer, turn on the WebLogic Server plug-in enabled flag for the domain. To turn on the WebLogic Server plug-in enabled flag:

1. Log in to the Administration Console.
2. Click the domain name in the navigation tree on the left.
3. Open the **Web Applications** tab.
4. Click **Lock & Edit**.
5. Select the **WebLogic Plugin Enabled** checkbox.
6. Click **Save** and then click **Activate Changes**.
7. Restart the Administration Server (even if the Administration Console does not specifically prompt for that):

- a. Start the Oracle WebLogic Scripting Tool (WLST):

```

cd ORACLE_COMMON_HOME/common/bin

./wlst.sh

```

- b. In the WLST shell, connect to Node Manager with the `nmConnect` command and the Node Manager credentials (make sure Node Manager is up and running), and start the Node Manager using `nmStart`:

```

wls:/offline>nmConnect("node_admin_user","node_admin_password",
"WCCHOST1","5556","domain_name","ASERVER_HOME")

wls:/nm/domain_name>nmStart("AdminServer")

```

The values of `node_admin_user` and `node_admin_password` are the Node Manager credentials.

- c. Stop the Administration Server, using either the Administration Console or, as follows, the WLST `nmKill` command:

```

wls:/nm/domain_name>nmKill("AdminServer")

```

- d. Start the Administration Server using `nmStart`:

```

wls:/offline>nmConnect("node_admin_user","node_admin_password",
"WCCHOST1","5556","domain_name","ASERVER_HOME")

wls:/nm/domain_name>nmStart("AdminServer")

```

11.7.7 Setting the Front-End URL for the Administration Console and Setting Redirection Preferences

When you access the WebLogic Server Administration Console using a load balancer, you must change the Administration Server's front-end URL so that the user's web browser is redirected to the appropriate load-balancer address.

The WebLogic Server Administration Console application tracks changes made to ports, channels and security using the console. When changes made through the console are activated, the console validates its current listen address, port and protocol. If the listen address, port and protocol are still valid, the console redirects the HTTP request, replacing the host and port information with the Administration Server's listen address and port.

To change the Administration Server's front-end URL:

1. Log in to the WebLogic Server Administration Console.
2. Click **Lock & Edit**.
3. Expand the **Environment** node in the **Domain Structure** tree on the left.
4. Click **Servers**.
5. On the Summary of Servers page, click **Admin Server** in the **Names** column of the table.
6. On the settings page for Administration Server, click the **Protocols** tab.
7. Click the **HTTP** tab.
8. Set the **Frontend Host** field to `admin.example.com` and the **Frontend HTTP Port** field to 80 (modify accordingly if HTTPS is used for the admin URL).
9. Save and activate the changes.
10. Restart the Administration Server for changes to the front-end host directive to take effect.

11.7.8 Validating Access to the Management Consoles and Administration Server

To verify the changes you have made in this chapter:

1. Use the following URL to the hardware load balancer to display the Oracle WebLogic Server Administration Console, and log in using the Oracle WebLogic Server administrator credentials:

```
http://admin.example.com/console
```

This validates that the `admin.example.com` virtual host on the load balancer is able to route requests to the Oracle HTTP Server instances on the web tier, which in turn can route requests for the Oracle WebLogic Server Administration Console to the Administration Server in the application tier.

2. Similarly, you should be able to access the Fusion Middleware Control using a similar URL:

```
http://admin.example.com/em
```

Extending the Domain to Include Oracle WebCenter Content

You need to perform certain tasks in order to extend the enterprise deployment domain with the Oracle WebCenter Content software. This includes installing the WebCenter Content, extending the domain for WebCenter Content and completing post-configuration and verification tasks.

This chapter provides information on installing the WebCenter Content, extending the domain for WebCenter Content and completing post-configuration and verification tasks.

[Installing WebCenter Content for an Enterprise Deployment](#)

The procedure for installing WebCenter Content in an enterprise deployment domain is explained in this section.

[Creating the Oracle WebCenter Content Database Schemas](#)

Before you can configure an Oracle WebCenter Content domain, you must install the required schemas in a certified database for use with this release of Oracle Fusion Middleware.

[Extending the Domain for WebCenter Content](#)

You need to perform the following tasks in order to extend the existing enterprise deployment domain with the Oracle WebCenter Content software.

[Completing Postconfiguration and Verification Tasks for WebCenter Content](#)

Several configuration and validation steps must be performed to bring the content servers online. Complete the following sections in the order listed.

[Configuring Content Server for the WebCenter Content User Interface](#)

If you are planning to use the WebCenter Content user interface (in addition to the native user interface for Content Server), you need to enable the Content Server parameters.

[Configuring Oracle HTTP Server for the WebCenter Content Cluster](#)

The instructions for configuring Oracle HTTP Server for the WebCenter Content Cluster are available in this section.

12.1 Installing WebCenter Content for an Enterprise Deployment

The procedure for installing WebCenter Content in an enterprise deployment domain is explained in this section.

This section contains the following procedures.

[Starting the Installation Program](#)

[Navigating the Installation Screens](#)

[Installing Oracle WebCenter Content on the Other Host Computers](#)

[Verifying the Installation](#)

12.1.1 Starting the Installation Program

To start the installation program:

1. Log in to WCCHOST1.
2. Go to the directory where you downloaded the installation program.
3. Launch the installation program by invoking the `java` executable from the JDK directory on your system, as shown in the example below.

```
JAVA_HOME/bin/java -d64 -jar fmw_12.2.1.2.0_wccontent_generic.jar
```

Be sure to replace the JDK location in these examples with the actual JDK location on your system.

When the installation program appears, you are ready to begin the installation.

12.1.2 Navigating the Installation Screens

The installation program displays a series of screens, in the order listed in the following table.

If you need additional help with any of the installation screens, click the screen name.

Screen	Description
Installation Inventory Screen	If you did not create a central inventory when you installed the Oracle Fusion Middleware Infrastructure software, then this dialog box appears. Edit the Inventory Directory field so it points to the location of your local inventory, and then click OK .
Welcome	This screen introduces you to the product installer.
Auto Updates	Use this screen to automatically search My Oracle Support for available patches or automatically search a local directory for patches that you've already downloaded for your organization.
Installation Location	Use this screen to specify the location of your Oracle home directory. For more information about Oracle Fusion Middleware directory structure, see "Selecting Directories for Installation and Configuration" in <i>Planning an Installation of Oracle Fusion Middleware</i> .
Prerequisite Checks	This screen verifies that your system meets the minimum necessary requirements. If there are any warning or error messages, you can refer to one of the documents in the Roadmap for Verifying Your System Environment section in <i>Planning Your Oracle Fusion Middleware Infrastructure Installation</i> .

Screen	Description
Installation Summary	Use this screen to verify the installation options you selected. Click Install to begin the installation.
Installation Progress	This screen allows you to see the progress of the installation. Click Next when the progress bar reaches 100% complete.
Installation Complete	Review the information on this screen, then click Finish to dismiss the installer.

12.1.3 Installing Oracle WebCenter Content on the Other Host Computers

If you have followed the EDG shared storage recommendations, there is a separate shared storage volume for product installations on WCCHOST2, and you must also install the software on WCCHOST2. For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

12.1.4 Verifying the Installation

After you complete the installation, you can verify it by successfully completing the following tasks.

[Reviewing the Installation Log Files](#)

[Checking the Directory Structure](#)

[Viewing the Contents of Your Oracle Home](#)

12.1.4.1 Reviewing the Installation Log Files

Review the contents of the installation log files to make sure that no problems were encountered. For a description of the log files and where to find them, see *Understanding Installation Log Files in Oracle Fusion Middleware Installing Software with the Oracle Universal Installer*.

12.1.4.2 Checking the Directory Structure

The contents of your installation vary based on the options you selected during the installation.

The addition of Oracle WebCenter Content will add the following directory and sub-directories:

```
/u01/oracle/products/fmw/wccontent
common
plugins
ucm
wccadf
```

```
/u01/oracle/products/fmw/wccapture
capture
common
plugins
```

For more information about the directory structure you should see after installation, see "What are the Key Oracle Fusion Middleware Directories?" in *Understanding Oracle Fusion Middleware*.

12.1.4.3 Viewing the Contents of Your Oracle Home

You can also view the contents of your Oracle home using the `viewInventory` script. For more information, see *Viewing the contents of an Oracle home in Oracle Fusion Middleware Installing Software with the Oracle Universal Installer*.

12.2 Creating the Oracle WebCenter Content Database Schemas

Before you can configure an Oracle WebCenter Content domain, you must install the required schemas in a certified database for use with this release of Oracle Fusion Middleware.

Follow the instructions in this section to install the schemas.

[Starting the Repository Creation Utility \(RCU\)](#)

[Navigating the RCU Screens to Create the Schemas](#)

12.2.1 Starting the Repository Creation Utility (RCU)

To start the Repository Creation Utility (RCU):

1. Navigate to the `ORACLE_HOME/oracle_common/bin` directory on your system.
2. Make sure the `JAVA_HOME` environment variable is set to the location of a certified JDK on your system. The location should be up to but not including the `bin` directory. For example, if your JDK is located in `/u01/oracle/products/jdk`:

On UNIX operating systems:

```
export JAVA_HOME=/u01/oracle/products/jdk
```

3. Start RCU:

On UNIX operating systems:

```
./rcu
```

12.2.2 Navigating the RCU Screens to Create the Schemas

After you start the RCU, you can then use the wizard screens to select and install the required schemas for your Oracle Fusion Middleware product. Schema creation involves the following tasks.

Task 1 Introducing RCU

Click **Next**.

Task 2 Selecting a Method of Schema Creation

If you have the necessary permission and privileges to perform DBA activities on your database, select **System Load and Product Load**. This procedure assumes that you have the necessary privileges.

If you do not have the necessary permission or privileges to perform DBA activities in the database, you must select **Prepare Scripts for System Load** on this screen. This option will generate a SQL script, which can be provided to your database administrator. See "Understanding System Load and Product Load" in *Creating Schemas with the Repository Creation Utility*.

Task 3 Providing Database Connection Details

Provide the database connection details for RCU to connect to your database.

In the **Host Name** field, enter the SCAN address of the Oracle RAC Database.

Enter the **DBMS/Service** details.

Enter the **Schema Owner** and **Schema Password** details.

Click **Next** to proceed, then click **OK** on the dialog window confirming that connection to the database was successful.

Task 4 Specifying a Custom Prefix and Selecting Schemas

Select **existing prefix**, and select the prefix you created while configuring the initial domain.

From the list of schemas, select the **WebCenter Content** schema. This will automatically select the following schemas as dependencies:

- **Oracle WebCenter Content Server - Complete**
- **Oracle WebCenter Enterprise Capture**
- **Oracle WebCenter Content Server - Search Only**

The custom prefix is used to logically group these schemas together for use in this domain only; you must create a unique set of schemas for each domain as schema sharing across domains is not supported.

Tip:

For more information about custom prefixes, see "Understanding Custom Prefixes" in *Creating Schemas with the Repository Creation Utility*.

For more information about how to organize your schemas in a multi-domain environment, see "Planning Your Schema Creation" in *Creating Schemas with the Repository Creation Utility*.

Tip:

You must make a note of the custom prefix you choose to enter here; you will need this later on during the domain creation process.

Click **Next** to proceed, then click **OK** in the dialog window confirming that prerequisite checking for schema creation was successful.

Task 5 Specifying Schema Passwords

Specify how you want to set the schema passwords on your database, then specify and confirm your passwords.

Tip:

You must make a note of the passwords you set on this screen; you will need them later on during the domain creation process.

Task 6 Verifying the Tablespaces for the Required Schemas

On the Map Tablespaces screen, review the information, and then click **Next** to accept the default values.

Click **OK** in the confirmation dialog box.

Task 7 Completing Schema Creation

Navigate through the remainder of the RCU screens to complete schema creation. When you reach the Completion Summary screen, click **Close** to dismiss RCU.

Task 8 Verifying the Schema Creation

To verify that the schemas were created successfully, and to verify the database connection details, use SQL*Plus or another utility to connect to the database, using the OCS schema name and the password you provided.

For example:

```
./sqlplus
SQL*Plus: Release 11.2.0.4.0 Production on Fri Nov 1 08:44:18 2013
Copyright (c) 1982, 2013, Oracle. All rights reserved.
Enter user-name: WCCEDG_OCS
Enter password: ocs_password

Connected to:
Oracle Database 11g Enterprise Edition Release 11.2.0.4.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

SQL>
```

12.3 Extending the Domain for WebCenter Content

You need to perform the following tasks in order to extend the existing enterprise deployment domain with the Oracle WebCenter Content software.

Extending the domain involves the following tasks.

[Starting the Configuration Wizard](#)

[Navigating the Configuration Wizard Screens to Extend the Domain with WebCenter Content](#)

12.3.1 Starting the Configuration Wizard

To start the Configuration Wizard:

1. From the WebLogic Server Console, stop any managed servers that will be modified by this domain extension. Managed Servers that are not effected can remain on-line.

2. For any managed servers to be modified, verify the managed server shutdown has completed.
3. Stop the Administration Server once all managed servers are in a steady state.
4. Navigate to the following directory and start the WebLogic Server Configuration Wizard.

```
cd ORACLE_HOME/oracle_common/common/bin
./config.sh
```

12.3.2 Navigating the Configuration Wizard Screens to Extend the Domain with WebCenter Content

Follow the instructions in the following sections to extend the domain for the topology with static or dynamic clusters.

[Extending the Domain with Static Clusters](#)

[Extending the Domain with Dynamic Clusters](#)

12.3.2.1 Extending the Domain with Static Clusters

Follow the instructions in this section to extend the domain for the topology with static clusters.

Note:

You can use the procedure described in this section to extend an existing domain with static clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain extension and configuration includes the following tasks:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying the Database Configuration Type"](#)
- [Task 4, "Specifying JDBC Component Schema Information"](#)
- [Task 5, "Providing the GridLink Oracle RAC Database Connection Details"](#)
- [Task 6, "Testing the JDBC Connections"](#)
- [Task 7, "Selecting Advanced Configuration"](#)
- [Task 8, "Configuring Managed Servers"](#)
- [Task 9, "Configuring a Cluster"](#)
- [Task 10, "Assigning Server Templates"](#)
- [Task 11, "Configuring Dynamic Servers"](#)
- [Task 12, "Assigning Managed Servers to the Cluster"](#)

- [Task 13, "Configuring Coherence Clusters"](#)
- [Task 14, "Creating Machines for WebCenter Content Servers"](#)
- [Task 15, "Assigning Servers to Machines"](#)
- [Task 16, "Configuring Virtual Targets"](#)
- [Task 17, "Configuring Partitions"](#)
- [Task 18, "Configuring the File Store"](#)
- [Task 19, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 20, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 21, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the ASERVER_HOME variable, which represents the complete path to the Administration domain home you created as part of the initial domain.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wccontent]**

In addition, the following additional templates should already be selected, because they were used to create the initial Infrastructure domain:

- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring the Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see "Understanding the Service Table Schema" in *Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see "Datasource Defaults" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

On the JDBC Component Schema screen, select all the UCM schemas (for WebCenter Content) in the table.

When you select the schemas, the fields on the page are activated and the database connection fields are populated automatically.

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, provide the information required to connect to the RAC database and component schemas, as shown in the following table.

Element	Description and Recommended Value
SCAN, Host Name, and Port	Select the SCAN check box. In the Host Name field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database. In the Port field, enter the SCAN listening port for the database (for example, 1521)
ONS Host and Port	In the ONS Host field, enter the SCAN address for the Oracle RAC database. In the Port field, enter the ONS Remote port (typically, 6200).
Enable Fan	Verify that the Enable Fan check box is selected, so the database can receive and process FAN events.

Task 6 Testing the JDBC Connections

Use the JDBC Component Schema Test screen to test the data source connections you have just configured.

A green check mark in the **Status** column indicates a successful test. If you encounter any issues, see the error message in the Connection Result Log section of the screen, fix the problem, then try to test the connection again.

Tip:

For more information about the other options on this screen, see "Test Component Schema" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
- **File Store**

Task 8 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server for Oracle WebCenter Content appears in the list of servers.

Perform the following tasks to modify the default Oracle WebCenter Content Managed Server and create a second Managed Server:

1. Rename the default Managed Server to WLS_WCC1.
2. Click **Add** to create a new Managed Server and name it WLS_WCC2.

Tip:

The server names recommended here will be used throughout this document; if you choose different names, be sure to replace them as needed.

3. Use the information in the following table to fill in the rest of the columns for each Oracle WebCenter Content Managed Server.

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Groups
WLS_WCC1	WCCHOST1	16200	Unchecke d	Disabled	UCM-MGD-SVR
WLS_WCC2	WCCHOST2	16200	Unchecke d	Disabled	UCM-MGD-SVR

Tip:

More information about the options on the Managed Server screen can be found in Managed Servers in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 9 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle WebCenter Content software.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `WCC_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `Unspecified`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to Considerations for Choosing Unicast or Multicast in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 10 Assigning Server Templates

Click **Next** to proceed to the next screen.

Task 11 Configuring Dynamic Servers

Verify that all dynamic server options are disabled for clusters that are to remain as static clusters.

1. Confirm that the **Dynamic Cluster**, **Calculated Listen Port**, and **Calculated Machine Names** checkboxes on this screen are unchecked.
2. Confirm the **Server Template** selection is **Unspecified**.
3. Click **Next**.

Task 12 Assigning Managed Servers to the Cluster

Use the Assign Servers to Clusters screen to assign `WLS_WCC1` and `WLS_WCC2` to the new cluster, `WCC_Cluster`:

1. In the Clusters pane, select the cluster to which you want to assign the servers; in this case, `WCC_Cluster`.
2. In the Servers pane, assign `WLS_WCC1` to `WCC_Cluster` by doing one of the following:
 - Click once on the `WLS_WCC1` Managed Server to select it, then click on the right arrow to move it beneath the selected cluster in the Clusters pane.
 - Double-click on `WLS_WCC1` to move it beneath the selected cluster in the clusters pane.
3. Repeat to assign `WLS_WCC2` to `WCC_Cluster`.
4. Click **Next** to proceed to the next screen.

Tip:

More information about the options on this screen can be found in Assign Servers to Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 13 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Update the port number value to **9991**.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 14 Creating Machines for WebCenter Content Servers

If required, use the Machines screen to add two new Unix Machines:

1. On the Unix Machines tab, click the **Add** button.
2. Enter WCCHOST1 in the **Name** field.
3. Enter the host name of WCCHOST1 for the Node Manager Listener address. Leave the Node Manager port to the default value of 5556.
4. Repeat the above steps for WCCHOST2.

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain, as shown in the following table.

Click **Next** to proceed.

Name	Node Manager Listen Address	Node Manager Listen Port
WCCHOST1	The value of the WCCHOST1 host name variable. For example, WCCHOST1.example.com.	5556
WCCHOST2	The value of the WCCHOST2 host name variable. For example, WCCHOST2.example.com.	5556
ADMINHOST	Enter the value of the ADMINVHN variable.	5556

Task 15 Assigning Servers to Machines

Use the Assign Servers to Machines screen to assign the Oracle WebCenter Content Managed Servers you just created to the corresponding machines in the domain.

Assign ADMINVHN to ADMINHOST.

Assign WLS_WCC1 to WCCHOST1, and assign WLS_WCC2 to WCCHOST2.

Tip:

More information about the options on this screen can be found in Assign Servers to Machines in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 16 Configuring Virtual Targets

Click **Next** to proceed to the next screen.

Task 17 Configuring Partitions

Click **Next** to proceed to the next screen.

Task 18 Configuring the File Store

In the File Stores screen, assign the following directory for each of the WebCenter Content Persistence stores including Content Server JMS file stores:

```
ORACLE_RUNTIME/domain_name/WCC_Cluster/jms
```

Note: Create the `jms` folder before starting the managed servers.

In this example, replace `ORACLE_RUNTIME` with the value of the variable for you environment. Replace `WCC_Cluster` with the name you assigned to the WebCenter Content cluster.

Select **Direct-Write** from the drop-down list for **Synchronous Write Policy** (for both the stores).

Task 19 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 20 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the configuration wizard.

Task 21 Start the Administration Server

Start the Administration Server, login, and then verify the clusters and servers views to ensure that the changes made to the domain have been applied.

After you have completed extending the domain with static clusters, go to [Completing Postconfiguration and Verification Tasks for WebCenter Content](#).

12.3.2.2 Extending the Domain with Dynamic Clusters

Follow the instructions in this section to extend the domain for the topology with dynamic clusters.

Note:

You can use the procedure described in this section to extend an existing domain with dynamic clusters . If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain extension and configuration includes the following tasks:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying the Database Configuration Type"](#)
- [Task 4, "Specifying JDBC Component Schema Information"](#)
- [Task 5, "Providing the GridLink Oracle RAC Database Connection Details"](#)
- [Task 6, "Testing the JDBC Connections"](#)
- [Task 7, "Selecting Advanced Configuration"](#)
- [Task 8, "Configuring Managed Servers"](#)
- [Task 9, "Configuring a Cluster"](#)
- [Task 10, "Assigning Server Templates"](#)
- [Task 11, "Configuring Dynamic Servers"](#)
- [Task 12, "Configuring Coherence Clusters"](#)
- [Task 13, "Creating Machines for WebCenter Content Servers"](#)
- [Task 14, "Assigning Servers to Machines"](#)
- [Task 15, "Configuring Virtual Targets"](#)
- [Task 16, "Configuring Partitions"](#)
- [Task 17, "Configuring the File Store"](#)
- [Task 18, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 19, "Writing Down Your Domain Home and Administration Server URL"](#)

- [Task 20, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the ASERVER_HOME variable, which represents the complete path to the Administration domain home you created as part of the initial domain.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wcccontent]**

In addition, the following additional templates should already be selected, because they were used to create the initial Infrastructure domain:

- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring the Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see "Understanding the Service Table Schema" in *Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see "Datasource Defaults" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

On the JDBC Component Schema screen, select all the UCM schemas (for WebCenter Content) in the table.

When you select the schemas, the fields on the page are activated and the database connection fields are populated automatically.

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, provide the information required to connect to the RAC database and component schemas, as shown in the following table.

Element	Description and Recommended Value
SCAN, Host Name, and Port	Select the SCAN check box. In the Host Name field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database. In the Port field, enter the SCAN listening port for the database (for example, 1521)
ONS Host and Port	In the ONS Host field, enter the SCAN address for the Oracle RAC database. In the Port field, enter the ONS Remote port (typically, 6200).
Enable Fan	Verify that the Enable Fan check box is selected, so the database can receive and process FAN events.

Task 6 Testing the JDBC Connections

Use the JDBC Component Schema Test screen to test the data source connections you have just configured.

A green check mark in the **Status** column indicates a successful test. If you encounter any issues, see the error message in the Connection Result Log section of the screen, fix the problem, then try to test the connection again.

Tip:

For more information about the other options on this screen, see "Test Component Schema" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
- **File Store**

Task 8 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server for Oracle WebCenter Content appears in the list of servers.

Static Managed Server definitions are not needed for dynamic cluster configurations. To remove the default Managed Server, complete the following steps:

1. Delete the default Managed Server.
2. Click **Next** to proceed to the next screen.

Task 9 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle WebCenter Content software.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `wcc_cluster` in the **Cluster Name** field.
3. Leave the **Cluster Address** field blank.
4. From the **Dynamic Server Groups** drop-down list, select `UCM-DYN-CLUSTER`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 10 Assigning Server Templates

Use the Server Templates screen to add a template:

1. Specify `UCM-server-template` in the **Name** field.
2. Specify `16200` in the **Listen Port** field.
3. Leave the **Enable SSL** option unchecked.
4. From the **Cluster** drop-down list, select `wcc_cluster`.
5. Click **Next** to proceed to the next screen.

Task 11 Configuring Dynamic Servers

Use the Dynamic Clusters screen to configure the required clusters:

1. Specify `WCC_Cluster` in the **Cluster Name** field.
2. Specify `WLS_WCC` in the **Server Name Prefix** field.
3. From the **Server Template** drop-down list, select `UCM-server-template`.
4. Specify `2` in the **Maximum Dynamic Server Count** field.
5. Specify `WCCHOST*` in the **Machine Name Match Expression** field.
6. Select the **Calculated Machine Names** and **Dynamic Cluster** fields.
7. Click **Next** to proceed to the next screen.

Task 12 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Update the port number value to **9991**.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 13 Creating Machines for WebCenter Content Servers

If required, use the Machines screen to add two new Unix Machines:

1. On the Unix Machines tab, click the **Add** button.
2. Enter `WCCHOST1` in the **Name** field.
3. Enter the host name of `WCCHOST1` for the Node Manager Listener address. Leave the Node Manager port to the default value of `5556`.
4. Repeat the above steps for `WCCHOST2`.

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain, as shown in the following table.

Click **Next** to proceed.

Name	Node Manager Listen Address	Node Manager Listen Port
ADMINHOST	Enter the value of the ADMINVHN variable.	5556
WCCHOST1	The value of the WCCHOST1 host name variable. For example, <code>WCCHOST1.example.com</code> .	5556
WCCHOST2	The value of the WCCHOST2 host name variable. For example, <code>WCCHOST2.example.com</code> .	5556

Task 14 Assigning Servers to Machines

Click **Next** to proceed to the next screen.

Task 15 Configuring Virtual Targets

Click **Next** to proceed to the next screen.

Task 16 Configuring Partitions

Click **Next** to proceed to the next screen.

Task 17 Configuring the File Store

In the File Stores screen, assign the following directory for each of the WebCenter Content Persistence stores including Content Server JMS file stores:

`ORACLE_RUNTIME/domain_name/WCC_Cluster/jms`

Note: Create the `jms` folder before starting the managed servers.

In this example, replace `ORACLE_RUNTIME` with the value of the variable for you environment. Replace `WCC_Cluster` with the name you assigned to the WebCenter Content cluster.

Select **Direct-Write** from the drop-down list for **Synchronous Write Policy** (for both the stores).

Task 18 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 19 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the configuration wizard.

Task 20 Start the Administration Server

Start the Administration Server, login, and then verify the clusters and servers views to ensure that the changes made to the domain have been applied.

12.4 Completing Postconfiguration and Verification Tasks for WebCenter Content

Several configuration and validation steps must be performed to bring the content servers online. Complete the following sections in the order listed.

[Propagating the Extended Domain to the Domain Directories and Machines](#)

[Starting the Node Manager in the Managed Server Domain Directory on WCCHOST1](#)

[Starting the WLS_WCC1 Managed Server](#)

[Configuring the Content Server on WLS_WCC1 Managed Server](#)

[Updating the cwallet File in the Administration Server](#)

[Starting the Node Manager in the Managed Server Domain Directory WCCHOST2](#)

[Starting the WLS_WCC2 Managed Server](#)

[Configuring the Content Server on WLS_WCC2 Managed Server](#)

[Validating GridLink Data Sources](#)

[Configuring Additional Parameters](#)

[Configuring Service Retries for Oracle WebCenter Content](#)

12.4.1 Propagating the Extended Domain to the Domain Directories and Machines

After you have extended the domain with the Oracle Content, and you have started the Administration Server on WCCHOST1, you can then propagate the domain changes to the domain directories and machines.

[Disabling the Derby Database](#)

[Packing Up the Extended Domain on WCCHOST1](#)

[Unpacking the Domain in Managed Server Domain Home on WCCHOST1](#)

[Unpacking the Domain on WCCHOST2](#)

12.4.1.1 Disabling the Derby Database

Before you create the Managed Server directory and start the Managed Servers, disable the embedded Derby database, which is a file-based database, packaged with Oracle WebLogic Server. The Derby database is used primarily for development environments. As a result, you must disable it when you are configuring a production-ready enterprise deployment environment; otherwise, the Derby database process will start automatically when you start the Managed Servers.

To disable the Derby database:

1. Navigate to the following directory in the Oracle home.

```
WL_HOME/common/derby/lib
```

2. Rename the Derby library jar file:

```
mv derby.jar disable_derby.jar
```

3. Complete steps 1 through 2 on each ORACLE_HOME for WCCHOST1 and WCCHOST2 if they use separate shared filesystems.

12.4.1.2 Packing Up the Extended Domain on WCCHOST1

Use the following steps to create a template JAR file that contains the domain configuration information, which now includes configuration information about Oracle WebCenter Content:

1. Log in to WCCHOST1 and run the pack command to create a template JAR file as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./pack.sh -managed=true
         -domain=ASERVER_HOME
         -template=/full_path/edgdomaintemplateExtWCC.jar
         -template_name=edgdomaintemplateExtWCC
```

In this example:

- Replace *ASERVER_HOME* with the actual path to the domain directory you created on the shared storage device.
 - Replace *full_path* with the complete path to the directory where you want the template jar file saved.
 - *edgdomaintemplateExtWCC.jar* is a sample name for the JAR file you are creating, which will contain the domain configuration files, including the configuration files for Oracle WebCenter Content.
 - *edgdomaintemplateExtWCC* is the name assigned to the domain template file.
2. Make a note of the location of the *edgdomaintemplateExtWCC.jar* file you just created with the pack command.

By default, the pack template file is created in the current directory where you ran the pack command. In this example, it would be created in the *ORACLE_COMMON_HOME/common/bin* directory, but you can specify a full path for the template JAR file as part of the *-template* argument to the pack command.

Tip:

For more information about the pack and unpack commands, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

12.4.1.3 Unpacking the Domain in Managed Server Domain Home on WCCHOST1

To copy the updated domain configuration information from the Administration Server domain directory to the Managed Servers domain directory:

1. Log in to WCCHOST1 if you haven't already.
2. If you haven't already, create the recommended directory structure for the Managed Server domain on WCCHOST1.

Use the examples in [File System and Directory Variables Used in This Guide](#) as a guide.

3. Run the `unpack` command to unpack the template in the domain directory on the local storage, as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME \
  -template=template=/full_path/edgdomaintemplateExtWCC.jar \
  -overwrite_domain=true \
  -app_dir=APPLICATION_HOME \
```

In this example:

- Replace `MSERVER_HOME` with the complete path to the domain home to be created on the local storage disk. This is the location where the copy of the domain will be unpacked.
- Replace `full_path` with the complete path to the directory where you want the template jar file saved.
- `edgdomaintemplateExtWCC.jar` is the directory path and name of the template you created when you ran the `pack` command to pack up the domain on the shared storage device.
- The `-overwrite_domain=true` argument is necessary when you are unpacking a Managed Server template into an existing domain and existing applications.

For any file that is overwritten, a backup copy of the original is created. If any modifications had been applied to the start scripts and EAR files in the Managed Server domain directory, they must be restored after this unpack operation.

- Replace `APPLICATION_HOME` with the complete path to the `applications` directory for the domain on shared storage.

Tip:

For more information about the `pack` and `unpack` commands, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

4. Change directory to the newly created `MSERVER_HOME` directory and verify that the domain configuration files were copied to the correct location on the Unpacking the Domain in on Managed Server Domain Home on WCCHOST1 shared storage device.

12.4.1.4 Unpacking the Domain on WCCHOST2

After you create a domain template jar, you can propagate the domain configuration to other hosts using the `unpack` command. To unpack the domain template jar file:

1. Log in to WCCHOST2.
2. If you haven't already, create the recommended directory structure for the Managed Server domain on WCCHOST2.

Use the examples in [File System and Directory Variables Used in This Guide](#) as a guide.

3. Make sure the domain template jar file is accessible to WCCHOST2.

For example, if you are using a separate shared storage volume or partition for WCCHOST2, then copy the template to the volume or partition mounted to WCCHOST2.

4. Run the `unpack` command to unpack the template in the domain directory on the local storage, as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME \
  -template=edgdomaintemplateExtWCC.jar \
  -app_dir=APPLICATION_HOME \
  -overwrite_domain=true
```

In this example:

- Replace `MSERVER_HOME` with the complete path to the domain home to be created on the local storage disk. This is the location where the copy of the domain will be unpacked.
- `edgdomaintemplateExtWCC.jar` is the directory path and name of the template you created when you ran the `pack` command to pack up the domain.

Note that if you are using a separate shared storage volume or partition for WCCHOST2 (and redundant Oracle homes), then you must first copy the template to the volume or partition mounted to WCCHOST2.

- Replace `APPLICATION_HOME` with the complete path to the applications directory for the domain on shared storage.

Tip:

For more information about the `pack` and `unpack` commands, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

5. Change directory to the newly created `MSERVER_HOME` directory and verify that the domain configuration files were copied to the correct location on WCCHOST2.

12.4.2 Starting the Node Manager in the Managed Server Domain Directory on WCCHOST1

After you create the Managed Server domain directory, there are two domain home directories and two corresponding Node Manager instances on WCCHOST1. You use one Node Manager to control the Administration Server, running from Administration Server domain home, and you use the other Node Manager to control the Managed Servers, running from the Managed Server domain home.

You must start the two Node Managers independently.

Note: The Node Manager for the Managed Server's *MSERVER_HOME* will be reset every time the domain configuration is unpacked. The `ListenAddress` will be changed to the *ADMINVHN* instead of the correct hostname. This needs to be changed to the correct value before starting the Node Manager service after an unpack is performed.

Follow these steps to update and start the Node Manager from the Managed Server home:

1. Verify that the listen address in the `nodemanager.properties` file is set correctly, by completing the following steps:

- a. Change to the following directory:

```
MSERVER_HOME/nodemanager/
```

- b. Open the `nodemanager.properties` file for editing.
- c. Update the `ListenAddress` property to the correct hostname as follows:

```
WCCHOST1: ListenAddress=WCCHOST1  
WCCHOST2: ListenAddress=WCCHOST2
```
- d. Update the `ListenPort` property with the correct Listen Port details.
- e. Make sure that `QuitEnabled` is set to 'true'. If this line is not present in the `nodemanager.properties` file, add the following line:

```
QuitEnabled=true
```

2. Change to the following directory:

```
MSERVER_HOME/bin
```

3. Use the following command to start the Node Manager:

```
nohup ./startNodeManager.sh > MSERVER_HOME/nodemanager/  
nodemanager.out 2>&1 &
```

For information about additional Node Manager configuration options, see *Oracle Fusion Middleware Administering Node Manager for Oracle WebLogic Server*.

12.4.3 Starting the WLS_WCC1 Managed Server

To start the WLS_WCC1 Managed Server:

1. Log in to the Oracle WebLogic Server Administration Console at `http://admin.example.com/console`.
2. Start the WLS_WCC1 Managed Server using the WebLogic Server Administration Console, as follows:
 - a. Expand the **Environment** node in the **Domain Structure** tree on the left.
 - b. Click **Servers**.
 - c. On the Summary of Servers page, open the **Control** tab.
 - d. Select **WLS_WCC1**, and then click **Start**.
3. Verify that the server status is reported as **Running** in the Administration Console. If the server is shown as **Starting** or **Resuming**, wait for the server status to change to **Started**. If another status is reported (such as **Admin** or **Failed**), check the server output log files for errors.

12.4.4 Configuring the Content Server on WLS_WCC1 Managed Server

To configure Content Server:

1. Create the runtime cluster subdirectories required for the Oracle WebCenter Content cluster configuration.

The Oracle WebCenter Content configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location of the Oracle WebCenter Content enterprise deployment is located at `ORACLE_RUNTIME/WCDomain/WCC_Cluster`.

Run the following commands to create the required subdirectories:

```
mkdir -p ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/vault
mkdir -p ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/weblayout
mkdir -p ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/data/users/profiles
```

2. Log in to WLS_WCC1 at `http://WCCHOST1:16200/cs` using the `weblogic` user name and password to display a configuration page.

The Oracle WebCenter Content configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location of the Oracle WebCenter Content enterprise deployment is at `ORACLE_RUNTIME/wcpedg_domain/WCC_Cluster`.

3. Change the following values on the server configuration page:

Make sure that the **Is new Content Server Instance?** check box is selected.

- **Content Server Instance Folder:** Set this to `ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/`
For example: `/u01/oracle/runtime/wcpedg_domain/WCC_Cluster/cs/`
- **Native File Repository Location:** Set this to `ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/vault/`
For example: `/u01/oracle/runtime/wcpedg_domain/WCC_Cluster/cs/vault/`

- **WebLayout Folder:** Set this to `ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/weblayout/`
For example: `/u01/oracle/runtime/wcpedg_domain/WCC_Cluster/cs/weblayout/`
- **User Profile Folder:** Set this to `ORACLE_RUNTIME/domain_name/WCC_Cluster/cs/data/users/profiles/`
For example: `/u01/oracle/runtime/wcpedg_domain/WCC_Cluster/cs/data/users/profiles/`
- **Server Socket Port:** 4444
- **Incoming Socket Connection Address Security Filter:** A pipe-delimited list of the local host and the server IP addresses:
`127.0.0.1|WCCHOST1-IP |WCCHOST2-IP |WCPHOST1-IP |WCPHOST2-IP |WEBHOST1-IP |WEBHOST2-IP |wcp.example.com-IP |wcpinternal.example.com-IP|load-balancer-host-IP`

Note: Must use IP addresses for all entries, including the load-balancer IP addresses for the internal virtual server and the primary interface depending on network address translation configuration settings at the load-balancer.

- **WebServer HTTP/HTTPS Address:** `wcc.example.com:443`
 - **Web Address is HTTPS:** Select this checkbox.
 - **Server Instance Name:** `WCC_Cluster`
 - **Server Instance Label:** `WCC_Cluster`
 - **Server Instance Description:** `WebCenter Content cluster`
 - **Auto_Number Prefix:** `WCC_Cluster-`
4. Click **Submit** when finished.
 5. Restart the Managed Server by using the WebLogic Server Administration Console.

12.4.5 Updating the `cwallet` File in the Administration Server

Content Server updates the `cwallet.sso` file located in the `MSERVER_HOME/config/fmwconfig` directory when it starts. This change needs to be propagated back to the Administration Server.

To do this, on `WCCHOST1`, copy the `cwallet.sso` file to `ASERVER_HOME/config/fmwconfig/` using the following command (note the back-slash for multi-line format):

```
cp MSERVER_HOME/config/fmwconfig/cwallet.sso \
ASERVER_HOME/config/fmwconfig/cwallet.sso
```

Note: If any operation is performed in a `WLS_WCCn` server that modifies the `cwallet.sso` file in the `MSERVER_HOME/config/fmwconfig/` directory, the file will have to be immediately copied to the Administration Server domain configuration directory on `WCCHOST1` at `ASERVER_HOME/config/fmwconfig`.

12.4.6 Starting the Node Manager in the Managed Server Domain Directory WCCHOST2

After you have propagated the domain configuration to `WCCHOST2`, you can update and start the Node Manager for the `MSERVER_HOME` domain directory.

You must start the two Node Managers independently.

Note: The Node Manager for the Managed Server's `MSERVER_HOME` will be reset every time the domain configuration is unpacked. The `ListenAddress` will be changed to the `ADMINVHN` instead of the correct hostname. This needs to be changed to the correct value before starting the Node Manager service after an unpack is performed.

Follow these steps to update and start the Node Manager from the Managed Server home:

1. Verify that the listen address in the `nodemanager.properties` file is set correctly, by completing the following steps:

- a. Change to the following directory:

```
MSERVER_HOME/nodemanager/
```

- b. Open the `nodemanager.properties` file for editing.
- c. Update the `ListenAddress` property to the correct hostname as follows:

```
WCCHOST1: ListenAddress=WCCHOST1
```

```
WCCHOST2: ListenAddress=WCCHOST2
```

- d. Update the `ListenPort` property with the correct Listen Port details.
- e. Make sure that `QuitEnabled` is set to 'true'. If this line is not present in the `nodemanager.properties` file, add the following line:

```
QuitEnabled=true
```

2. Navigate to the following directory:

```
MSERVER_HOME/bin
```

3. Use the following command to start the Node Manager:

```
nohup ./startNodeManager.sh > $MSERVER_HOME/nodemanager/nodemanager.out 2>&1 &
```

For information about additional Node Manager configuration options, see *Oracle Fusion Middleware Administering Node Manager for Oracle WebLogic Server*.

12.4.7 Starting the WLS_WCC2 Managed Server

To start the WLS_WCC2 Managed Server:

1. Start the WLS_WCC2 Managed Server using the WebLogic Server Administration Console, as follows:
 - a. Expand the **Environment** node in the **Domain Structure** tree on the left.
 - b. Click **Servers**.
 - c. On the Summary of Servers page, open the **Control** tab.
 - d. Select **WLS_WCC2**, and then click **Start**.
2. Verify that the server status is reported as **Running** in the Administration Console. If the server is shown as **Starting** or **Resuming**, wait for the server status to change to **Started**. If another status is reported (such as **Admin** or **Failed**), check the server output log files for errors.

12.4.8 Configuring the Content Server on WLS_WCC2 Managed Server

To configure Content Server:

1. Log in to WLS_WCC2 at `http://WCCHOST2:16200/cs` using the `weblogic` administration user name and password to display a configuration page.

The Oracle WebCenter Content configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location of the Oracle WebCenter Content enterprise deployment is at `ORACLE_RUNTIME/WCDomain/WCC_Cluster`.

2. Change the following values on the server configuration page:
 - **Content Server Instance Folder:** Set this to `ORACLE_RUNTIME/WCDomain/WCC_Cluster/cs`.
 - **Native File Repository Location:** Set this to `ORACLE_RUNTIME/WCDomain/WCC_Cluster/cs/vault`.
 - **WebLayout Folder:** Set this to `ORACLE_RUNTIME/WCDomain/WCC_Cluster/cs/weblayout`.
 - **User Profile Folder:** Set this to `ORACLE_RUNTIME/WCDomain/WCC_Cluster/cs/data/users/profiles`.
 - **Content Server URL Prefix:** `/cs/` (default value)

Make sure that the **Is new Content Server Instance?** check box is not selected.

3. Click **Submit** when finished.
4. Restart the Managed Server by using the WebLogic Server Administration Console.

12.4.9 Validating GridLink Data Sources

After the servers are started, verify that the GridLink data sources are correctly configured and that the ONS setup is correct. Perform these procedures for every GridLink data source created.

[Verifying the Configuration of a GridLink Data Source for WebCenter Content](#)

[Verifying the Configuration of ONS for a GridLink Data Source](#)

12.4.9.1 Verifying the Configuration of a GridLink Data Source for WebCenter Content

To verify the configuration of a GridLink data source for WebCenter Content:

1. Log in to the WebLogic Server Administration Console.
2. In the **Domain Structure** tree, expand **Services**, then click **Data Sources**.
3. Click the name of a GridLink data source that was created.
4. Click the **Monitoring** tab.
5. Click the **Testing** tab, select one of the servers, and click **Test Data Source**.

The test should be successful if the configuration is correct.

6. Repeat the test for every WebLogic Server instance that uses the GridLink data source.

12.4.9.2 Verifying the Configuration of ONS for a GridLink Data Source

To verify the configuration of ONS for a GridLink data source for WebCenter Content:

1. In the **Domain Structure** tree on the Administration Console, expand **Services**, then click **Data Sources**.
2. Click the name of a GridLink data source.
3. Click the **Monitoring** tab.
4. Click the name of the server (WLS_WCC1).
5. Click the **ONS** tab.
6. In the **ONS** tab, select the **Testing** tab.
7. Select a server, and click **Test ONS**.

The test should be successful if the configuration is correct. If the ONS test fails, verify that the ONS service is running in the Oracle RAC database nodes:

```
[orcl@WCCDBHOST1 ~]$ srvctl status scan_listener
SCAN Listener LISTENER_SCAN1 is enabled
SCAN listener LISTENER_SCAN1 is running on node WCCDBHOST1
SCAN Listener LISTENER_SCAN2 is enabled
SCAN listener LISTENER_SCAN2 is running on node WCCDBHOST2
SCAN Listener LISTENER_SCAN3 is enabled
SCAN listener LISTENER_SCAN3 is running on node WCCDBHOST2
```

```
[orcl@WCCDBHOST1 ~]$ srvctl config nodeapps -s
ONS exists: Local port 6100, remote port 6200, EM port 2016
```

```
[orcl@WCCDBHOST1 ~]$ srvctl status nodeapps | grep ONS
ONS is enabled
ONS daemon is running on node: WCCDBHOST1
ONS daemon is running on node: WCCDBHOST2
```

8. Repeat the ONS test for every WebLogic Server instance that uses the GridLink data source.

12.4.10 Configuring Additional Parameters

Using a text editor, add the following options to each cluster node's `MSEVER_HOME/ucm/cs/bin/WLS_WSMn_intradoc.cfg` file, where the directories specified are on a direct-bus-attached-controlled local disk and not a remote file system, such as a UNIX/Linux mounted NFS or clustered file system (like OCFS2, GFS2, or GPFS):

```
TraceDirectory=MSEVER_HOME/servers/WLS_WCCN/logs
EventDirectory=MSEVER_HOME/servers/WLS_WCCN/logs/event/
ArchiverDoLocks=true
DisableSharedCacheChecking=true
```

The trailing *N* should match your nodes server names, like `WLS_WCC1` is for `WCCHOST1` and `WLS_WCC2` is for `WCCHOST2`, and so on.

These changes will take effect after a restart of all WebCenter Content Managed Servers, at the end of the procedure described in [Configuring Service Retries for Oracle WebCenter Content](#).

Note: The directories can reside in any local disk path that you have determined to have enough space to hold the WebCenter Content logs and any trace that you may configure. The preceding paths are a suggestion.

12.4.11 Configuring Service Retries for Oracle WebCenter Content

The following parameter should be set in the Content Server `config.cfg` file to enable login retries during an Oracle RAC failover:

```
ServiceAllowRetry=true
```

If this value is not set, users will need to manually retry any operation that was in progress when the failover began.

To configure service retries for Oracle WebCenter Content:

1. Go to Content Server at `http://WCCHOST1:16200/cs`, and log in using the non-LDAP WebLogic Server administration user name (for example, *weblogic*) and password.
2. From the **Administration** tray or menu, choose **Admin Server**, then **General Configuration**.
3. On the General Configuration page, add the following parameter in the **Additional Configuration Variables** box:

```
ServiceAllowRetry=true
```

4. Click **Save**.

Note:

The new parameter is included in the `config.cfg` file, which is at the following location:

```
ORACLE_RUNTIME/domain_name/cluster_name/cs/config/
config.cfg
```

(You can also edit this file directly in a text editor. Remember to restart all WebCenter Content Managed Servers.)

12.5 Configuring Content Server for the WebCenter Content User Interface

If you are planning to use the WebCenter Content user interface (in addition to the native user interface for Content Server), you need to enable the Content Server parameters.

From the **Administration** tray or menu, select **Admin Server > Component Manager** and then enable the following parameters:

- AutoSuggestConfig
- DynamicConverter
- FrameworkFolders

In addition, you need to set up the Remote Intradoc Client (RIDC) for communication between the WebCenter Content user interface and Content Server.

You can also set the following Content Server parameters for folders and searching, for the WebCenter Content user interface. To set the Content Server parameters for folders and searching for the WebCenter Content user interface:

1. From the **Administration** menu, select **Admin Server**.
2. Select **General Configuration**.
3. On the General Configuration page, add the following parameters in the **Additional Configuration Variables** tab:
 - FoldersIndexParentFolderValues=true
 - FldEnforceFolderFileNameUniqueness=true
 - FldEnforceCaseInsensitiveNameUniqueness=true
 - SearchIndexerEngineName=OracleTextSearch or
SearchIndexerEngineName=DATABASE.METADATA

Select either one of the values - OracleTextSearch or DATABASE.METADATA.

12.6 Configuring Oracle HTTP Server for the WebCenter Content Cluster

The instructions for configuring Oracle HTTP Server for the WebCenter Content Cluster are available in this section.

Configuring Oracle HTTP Server for the WLS_WCC Managed Servers

Enabling Access for Content Server Admin Applets

Validating Access Through the Load Balancer

12.6.1 Configuring Oracle HTTP Server for the WLS_WCC Managed Servers

To configure the Oracle HTTP Server instances in the web tier so they route requests correctly to the Oracle WebCenter Content cluster, use the following procedure to create an additional Oracle HTTP Server configuration file that creates and defines the parameters of the `wcc.example.com` virtual server. To configure Oracle HTTP Server for the WLS_WCC Managed Servers:

1. Log in to WEBHOST1 and change directory to the configuration directory for the first Oracle HTTP Server instance (`ohs1`).

```
cd OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs1/moduleconf/
```

Note:

There are separate directories for configuration and runtime instance files. The runtime files under the `.../OHS/instances/ohsn/*` folder should not be edited directly. Edit only the `.../OHS/ohsn/*` configuration files.

2. Create the `wcc_vh.conf` file and add the following directive:

```
<VirtualHost WEBHOST1:7777>
  ServerName https://wccinternal.example.com:443
  ServerAdmin you@your.address
  RewriteEngine On
  RewriteOptions inherit
</VirtualHost>
```

3. In the `wcc_vh.conf` file, add the following lines between the `<VirtualHost>` and `</VirtualHost>` tags:

```
#UCM
<Location /cs>
  WebLogicCluster WCCHOST1:16200,WCCHOST2:16200
  WLSRequest ON
  WLCookieName JSESSIONID
  WLProxySSL ON
  WLProxySSLPassThrough ON
</Location>

<Location /adfAuthentication>
  WebLogicCluster WCCHOST1:16200,WCCHOST2:16200
  WLSRequest ON
  WLCookieName JSESSIONID
  WLProxySSL ON
  WLProxySSLPassThrough ON
</Location>

<Location /_ocsh>
  WebLogicCluster WCCHOST1:16200,WCCHOST2:16200
  WLSRequest ON
  WLCookieName JSESSIONID
  WLProxySSL ON
```



```

    WLProxySSLPassthrough ON
  </Location>

```

4. Copy the `wcc_vh.conf` file to the configuration directory for the second Oracle HTTP Server instance (`ohs2`):

```
OHS_DOMAIN_HOME/config/fmwconfig/components/ohs2/moduleconf/
```

5. Edit the `wcc_vh.conf` and change any references of `WEBHOST1` to `WEBHOST2` in the `<VirtualHost>` directives.
6. Restart the Oracle HTTP server instances on `WEBHOST1` and `WEBHOST2`.

12.6.2 Enabling Access for Content Server Admin Applets

Because the SSL termination is configured on Oracle Web Tier for the enterprise deployment reference topology, the WebLogic Plug-In needs to be enabled for each WebCenter Content Managed Server for successful access to the Content Server Admin Applets. To enable access for Content Server Admin Applets:

1. Log in to the WebLogic Server Administration Console at `http://host.domain:port/console`; for example:
`http://ADMINVHN:7001/console`
2. On the **Environment** tab, click **Servers**.
3. Click **WLS_WCC1**.
4. Click the **General** tab on the **Configuration** tab, and go to the Advanced section.
5. Click **Lock & Edit**.
6. Select **Yes** from the **WebLogic Plug-In Enabled** drop-down menu.
7. Click the **Save** button to save the change.
8. Click **Activate Changes**.
9. Restart the `WLS_WCC1` Managed Server from the Administration Console.
10. Repeat the above instructions for the `WLS_WCC2` Managed Server.

12.6.3 Validating Access Through the Load Balancer

You should verify URLs to ensure that appropriate routing and failover is working from Oracle HTTP Server to `WCC_Cluster`.

[Verifying the URLs](#)

[Verifying the Cluster Nodes](#)

12.6.3.1 Verifying the URLs

To verify the URLs:

1. While `WLS_WCC2` is running, stop `WLS_WCC1` using the WebLogic Server Administration Console.
2. Access `https://wcc.example.com/cs` to verify that it is functioning properly.

3. Start WLS_WCC1 from the WebLogic Server Administration Console.
4. Stop WLS_WCC2 from the WebLogic Server Administration Console.
5. Access `https://wcc.example.com/cs` to verify that it is functioning properly.

You can verify the cluster node to which you were directed after the traffic balancing provided through your load balancer and then again through the web tier.

12.6.3.2 Verifying the Cluster Nodes

To verify the cluster node:

1. Log in to the following WebCenter Content page, using your administrator user and password credentials:

```
https://wcc.example.com/cs/idcplg?IdcService=CONFIG_INFO
```

2. Browse to the Administration/Configuration for WCC_Cluster page.
3. In the Options and Others section of the page, click **Java Properties** on the right.
4. Obtain the value for **weblogic.Name**.

This value denotes the cluster node you are accessing at the moment.

Extending the Domain with Oracle SOA Suite

You need to perform certain tasks in order to extend the enterprise deployment domain with the Oracle SOA Suite software.

[Variables Used When Configuring Oracle SOA Suite](#)

While extending the domain with Oracle SOA Suite, you will be referencing the directory variables listed in this section.

[Synchronizing the System Clocks](#)

Before you extend the domain to include Oracle SOA Suite, verify that the system clocks on each host computer are synchronized. You can do this by running the `date` command simultaneously on all the hosts in each cluster.

[Installing the Software for an Enterprise Deployment](#)

The procedure for installing the software for an enterprise deployment is explained in this section.

[Creating the Oracle SOA Suite Database Schemas](#)

Before you can configure an Oracle SOA Suite domain, you must install the required schemas in a certified database for use with this release of Oracle Fusion Middleware.

[Extending the Enterprise Deployment Domain with Oracle SOA Suite](#)

You need to perform the following tasks for extending the existing enterprise deployment domain with the Oracle SOA Suite software.

[Configuring a Default Persistence Store for Transaction Recovery](#)

Oracle WebLogic Server uses the transaction logs to recover from system crashes or network failures.

[Propagating the Extended Domain to the Domain Directories and Machines](#)

After you have extended the domain with the Oracle WebCenter Content instances, and you have restarted the Administration Server on `WCCHOST1`, you must then propagate the domain changes to the domain directories and machines.

[Updating the NodeManager Configuration After Unpacking the Domain](#)

When extending a domain after setting up custom keystores, certificates, and custom identity aliases, the `nodemanager.properties` file in `MSERVER_HOME` may be overwritten with some values from the `nodemanager.properties` file for `ASERVER_HOME`. Specifically, the `ListenAddress` and/or `CustomIdentityAlias` values can be reset.

[Modifying the Upload and Stage Directories to an Absolute Path](#)

After configuring the domain and unpacking it to the Managed Server domain directories on all the hosts, verify and update the upload and stage directories for Managed Servers in the new clusters. If implementing dynamic clusters, the configuration of the server template assigned to each newly added cluster should be verified and updated, otherwise, verify and update every statically-defined Managed Server for the newly added clusters.

[Starting and Validating the WLS_SOA1 Managed Server](#)

Now that you have extended the domain, started the Administration Server, and propagated the domain to the other hosts, you can start the newly configured Oracle SOA Suite Managed Servers.

[Starting and Validating the WLS_SOA2 Managed Server](#)

After validating the successful configuration and startup of the WLS_SOA1 Managed Server, you can start and validate the WLS_SOA2 Managed Server.

[Validating the Location and Creation of the Transaction Logs](#)

After WLS_SOA1 and WLS_SOA2 are up and running, verify that the transaction log directory and transaction logs were created as expected.

[Configuring Oracle HTTP Server for the Extended Domain](#)

The following sections describe how to configure the Oracle HTTP Server instances so they route requests for both public and internal URLs to the proper clusters in the enterprise topology.

[Post-Configuration Steps for Oracle SOA Suite](#)

After you install and configure Oracle SOA Suite, consider the following post-configuration tasks.

[Enabling Automatic Service Migration and JDBC Persistent Stores for Oracle SOA Suite](#)

To ensure that Oracle SOA Suite is configured for high availability, configure the Oracle SOA Suite Managed Servers for automatic service migration.

13.1 Variables Used When Configuring Oracle SOA Suite

While extending the domain with Oracle SOA Suite, you will be referencing the directory variables listed in this section.

The values for several directory variables are defined in [File System and Directory Variables Used in This Guide](#).

- ORACLE_HOME
- ASERVER_HOME
- MSERVER_HOME
- APPLICATION_HOME
- DEPLOY_PLAN_HOME
- OHS_DOMAIN_HOME
- JAVA_HOME

- ORACLE_RUNTIME

In addition, you'll be referencing the following virtual IP (VIP) address defined in [Reserving the Required IP Addresses for an Enterprise Deployment](#):

- ADMINVHN

Actions in this chapter will be performed on the following host computers:

- WCCHOST1
- WCCHOST2
- WEBHOST1
- WEBHOST2

13.2 Synchronizing the System Clocks

Before you extend the domain to include Oracle SOA Suite, verify that the system clocks on each host computer are synchronized. You can do this by running the `date` command simultaneously on all the hosts in each cluster.

Alternatively, there are third-party and open-source utilities you can use for this purpose.

13.3 Installing the Software for an Enterprise Deployment

The procedure for installing the software for an enterprise deployment is explained in this section.

[Starting the Oracle SOA Suite Installer on WCCHOST1](#)

[Navigating the Installation Screens](#)

[Verifying the Installation](#)

[Installing Oracle SOA Suite on the Other Host Computers](#)

13.3.1 Starting the Oracle SOA Suite Installer on WCCHOST1

To start the installation program:

1. Log in to WCCHOST1.
2. Go to the directory where you downloaded the installation program.
3. Launch the installation program by invoking the `java` executable from the JDK directory on your system, as shown in the example below.

```
JAVA_HOME/bin/java -d64 -jar fmw_12.2.1.2.0_soa_generic.jar
```

Be sure to replace the JDK location in these examples with the actual JDK location on your system.

For information about downloading the software and locating the actual installer file name for your product, see [Identifying and Obtaining Software Distributions for an Enterprise Deployment](#).

When the installation program appears, you are ready to begin the installation.

13.3.2 Navigating the Installation Screens

The installation program displays a series of screens, in the order listed in the following table.

If you need additional help with any of the installation screens, click the screen name.

Screen	Description
Welcome	This screen introduces you to the product installer.
Auto Updates	Use this screen to automatically search My Oracle Support for available patches or automatically search a local directory for patches that you've already downloaded for your organization.
Installation Location	Use this screen to specify the location of your Oracle home directory. For more information about Oracle Fusion Middleware directory structure, see <i>Selecting Directories for Installation and Configuration in Planning an Installation of Oracle Fusion Middleware</i> .
Installation Type	Use this screen to select the type of installation and consequently, the products and feature sets you want to install. <ul style="list-style-type: none"> • Select SOA Suite
Prerequisite Checks	This screen verifies that your system meets the minimum necessary requirements. If there are any warning or error messages, you can refer to one of the documents in the Roadmap for Verifying Your System Environment section in <i>Oracle Fusion Middleware Installing and Configuring the Oracle Fusion Middleware Infrastructure</i> .
Installation Summary	Use this screen to verify the installation options you selected. Click Install to begin the installation.
Installation Progress	This screen allows you to see the progress of the installation. Click Next when the progress bar reaches 100% complete.
Installation Complete	Review the information on this screen, then click Finish to dismiss the installer.

13.3.3 Verifying the Installation

After you complete the installation, you can verify it by successfully completing the following tasks.

[Reviewing the Installation Log Files](#)

[Checking the Directory Structure](#)

[Viewing the Contents of Your Oracle Home](#)

13.3.3.1 Reviewing the Installation Log Files

Review the contents of the installation log files to make sure that no problems were encountered. For a description of the log files and where to find them, see

Understanding Installation Log Files in *Oracle Fusion Middleware Installing Software with the Oracle Universal Installer*.

13.3.3.2 Checking the Directory Structure

The contents of your installation vary based on the options you selected during the installation.

The addition of Oracle SOA Suite adds the following directory and sub-directories:

```
/u01/oracle/products/fmw/soa
```

```
bam  
bin  
bpm  
common  
integration  
jlib  
plugins  
readme.txt  
reports  
soa
```

For more information about the directory structure you should see after installation, see *What are the Key Oracle Fusion Middleware Directories?* in *Understanding Oracle Fusion Middleware*.

13.3.3.3 Viewing the Contents of Your Oracle Home

You can also view the contents of your Oracle home using the `viewInventory` script. For more information, see *Viewing the contents of an Oracle home* in *Installing Software with the Oracle Universal Installer*.

13.3.4 Installing Oracle SOA Suite on the Other Host Computers

If you have configured a separate shared storage volume or partition for the products mount point and `ORACLE_HOME` on `WCCHOST2`, then you must also perform the product installation on `WCCHOST2`.

For more information, see [Shared Storage Recommendations When Installing and Configuring an Enterprise Deployment](#).

To install the software on the other host computers in the topology, log in to each host, and use the instructions in [Starting the Infrastructure Installer on WCCHOST1](#) and [Navigating the Infrastructure Installation Screens](#) to create the Oracle home on the appropriate storage device.

Note:

In previous releases, the recommended enterprise topology included a colocated set of Oracle HTTP Server instances. In those releases, there was a requirement to install the Infrastructure on the Web Tier hosts (`WEBHOST1` and `WEBHOST2`). However, for this release, the enterprise deployment topology assumes the Web servers are installed and configured in standalone mode, so they are not considered part of the application tier domain. For more information, see [Configuring the Web Tier for an Enterprise Deployment](#)

13.4 Creating the Oracle SOA Suite Database Schemas

Before you can configure an Oracle SOA Suite domain, you must install the required schemas in a certified database for use with this release of Oracle Fusion Middleware.

[Starting the Repository Creation Utility \(RCU\)](#)

[Navigating the RCU Screens to Create the Schemas](#)

[Configuring SOA Schemas for Transactional Recovery](#)

13.4.1 Starting the Repository Creation Utility (RCU)

To start the Repository Creation Utility (RCU):

1. Navigate to the `ORACLE_HOME/oracle_common/bin` directory on your system.
2. Make sure the `JAVA_HOME` environment variable is set to the location of a certified JDK on your system. The location should be up to but not including the `bin` directory. For example, if your JDK is located in `/u01/oracle/products/jdk`:

On UNIX operating systems:

```
export JAVA_HOME=/u01/oracle/products/jdk
```

3. Start RCU:

On UNIX operating systems:

```
./rcu
```

13.4.2 Navigating the RCU Screens to Create the Schemas

Schema creation involves the following tasks:

- [Task 1, "Introducing RCU"](#)
- [Task 2, "Selecting a Method of Schema Creation"](#)
- [Task 3, "Providing Database Connection Details"](#)
- [Task 4, "Specifying a Custom Prefix and Selecting Schemas"](#)
- [Task 5, "Specifying Schema Passwords"](#)
- [Task 6, "Specifying Custom Variables"](#)
- [Task 7, "Verifying the Tablespaces for the Required Schemas"](#)
- [Task 8, "Completing Schema Creation"](#)
- [Task 9, "Verifying the Schema Creation"](#)

Task 1 Introducing RCU

Click **Next**.

Task 2 Selecting a Method of Schema Creation

If you have the necessary permission and privileges to perform DBA activities on your database, select **System Load and Product Load**. This procedure assumes that you have the necessary privileges.

If you do not have the necessary permission or privileges to perform DBA activities in the database, you must select **Prepare Scripts for System Load** on this screen. This option will generate a SQL script, which can be provided to your database administrator to create the required schema. See Understanding System Load and Product Load in *Creating Schemas with the Repository Creation Utility*.

Task 3 Providing Database Connection Details

Provide the database connection details for RCU to connect to your database.

In the **Host Name** field, enter the SCAN address of the Oracle RAC Database.

Enter the **DBMS/Service** details.

Enter the **Schema Owner** and **Schema Password** details.

Click **Next** to proceed, then click **OK** on the dialog window confirming that connection to the database was successful.

Task 4 Specifying a Custom Prefix and Selecting Schemas

Choose **Select existing prefix**, and then select the prefix you used when you created the initial domain.

From the list of schemas, select the **SOA Suite** schema. This will automatically select **SOA Infrastructure**. In addition, the following dependent schemas have already been installed with the Infrastructure and are grayed out:

- **Common infrastructure Services**
- **User Messaging Service**
- **Metadata Services**
- **Weblogic Services**
- **Oracle Platform Security Services**
- **Audit Services**
- **Audit Services Append**
- **Audit Services Viewer**

The custom prefix is used to logically group these schemas together for use in this domain only; you must create a unique set of schemas for each domain as schema sharing across domains is not supported.

Tip:

For more information about custom prefixes, see Understanding Custom Prefixes in *Creating Schemas with the Repository Creation Utility*.

For more information about how to organize your schemas in a multi-domain environment, see Planning Your Schema Creation in *Creating Schemas with the Repository Creation Utility*.

Click **Next** to proceed, then click **OK** on the dialog window confirming that prerequisite checking for schema creation was successful.

Task 5 Specifying Schema Passwords

Specify how you want to set the schema passwords on your database, then specify and confirm your passwords.

Tip:

You must make a note of the passwords you set on this screen; you will need them later on during the domain creation process.

Task 6 Specifying Custom Variables

Specify the custom variables for the SOA Infrastructure schema.

For the enterprise deployment topology, enter `MEDIUM` for the **Database Profile** custom variable; enter `NO` for the **Healthcare Integration** variable.

If you are planning on using Oracle Healthcare, then enter `YES` for the **Healthcare Integration** variable.

For more information, see About the Custom Variables Required for the SOA Suite Schemas in *Installing and Configuring Oracle SOA Suite and Business Process Management*.

Component	Custom Variable	Value
SOA Infrastructure	Database Profile (SMALL/MED/LARGE)	LARGE
	Healthcare Integration(YES/NO)	NO

Task 7 Verifying the Tablespaces for the Required Schemas

On the Map Tablespaces screen, review the information, and then click **Next** to accept the default values.

Click **OK** in the confirmation dialog box.

Task 8 Completing Schema Creation

Navigate through the remainder of the RCU screens to complete schema creation. When you reach the Completion Summary screen, click **Close** to dismiss RCU.

Task 9 Verifying the Schema Creation

To verify that the schemas were created successfully, and to verify the database connection details, use SQL*Plus or another utility to connect to the database, using the SOAINFRA schema name and the password you provided.

For example:

```
./sqlplus
```

```
SQL*Plus: Release 12.1.0.1.0 Production on Wed Aug 31 05:41:31 2016
```

```
Copyright (c) 1982, 2013, Oracle. All rights reserved.
```

```
Enter user-name: FMW1221_SOAINFRA
```

```
Enter password: soainfra_password
```

```

Connected to:
Oracle Database 11g Enterprise Edition Release 12.1.0.1.0 - 64bit Production
With the Partitioning, OLAP, Data Mining and Real Application Testing options

```

```
SQL>
```

13.4.3 Configuring SOA Schemas for Transactional Recovery

After you have installed the Oracle SOA Suite schemas successfully, use the procedure in this section to configure the schemas for transactional recovery.

This procedure sets the appropriate database privileges so that the Oracle WebLogic Server transaction manager can query the schemas for transaction state information and issue the appropriate commands, such as commit and rollback, during recovery of in-flight transactions after a WebLogic Server is unexpectedly unavailable.

These privileges should be granted to the owner of the SOAINFRA schema, which you defined when you created the schemas with the Repository Creation Utility.

To configure the SOA schemas for transactional recovery privileges:

1. Log on to SQL*Plus as a user with sysdba privileges. For example:

```
sqlplus "/ as sysdba"
```

2. Enter the following commands:

```
SQL> Grant select on sys.dba_pending_transactions to soa_schema_prefix_soainfra;
```

```
Grant succeeded.
```

```
SQL> Grant force any transaction to soa_schema_prefix_soainfra;
```

```
Grant succeeded.
```

```
SQL>
```

13.5 Extending the Enterprise Deployment Domain with Oracle SOA Suite

You need to perform the following tasks for extending the existing enterprise deployment domain with the Oracle SOA Suite software.

Extending the domain involves the following tasks.

[Starting the Configuration Wizard](#)

[Navigating the Configuration Wizard Screens to Extend the Domain with Oracle SOA Suite](#)

13.5.1 Starting the Configuration Wizard

To start the Configuration Wizard:

1. From the WebLogic Server Console, stop any managed servers that will be modified by this domain extension. Managed Servers that are not effected can remain on-line.
2. For any managed servers to be modified, verify the managed server shutdown has completed.

3. Stop the Administration Server once all managed servers are in a steady state.
4. Navigate to the following directory and start the WebLogic Server Configuration Wizard.

```
cd ORACLE_HOME/oracle_common/common/bin
./config.sh
```

13.5.2 Navigating the Configuration Wizard Screens to Extend the Domain with Oracle SOA Suite

Follow the instructions in the following sections to create and configure the domain for the topology, with static or dynamic clusters.

[Extending the Domain with Static Clusters](#)

[Extending the Domain with Dynamic Clusters](#)

13.5.2.1 Extending the Domain with Static Clusters

Follow the instructions in this section to create and configure the domain for the topology with static clusters.

Note:

You can use the same procedure described in this section to extend an existing domain with static clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks.

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying the Database Configuration Type"](#)
- [Task 4, "Specifying JDBC Component Schema Information"](#)
- [Task 5, "Providing the GridLink Oracle RAC Database Connection Details"](#)
- [Task 6, "Testing the JDBC Connections"](#)
- [Task 7, "Keystore"](#)
- [Task 8, "Selecting Advanced Configuration"](#)
- [Task 9, "Configuring Managed Servers"](#)
- [Task 10, "Configuring a Cluster"](#)
- [Task 11, "Assigning Server Templates"](#)
- [Task 12, "Configuring Dynamic Servers"](#)
- [Task 13, "Assigning Managed Servers to the Cluster"](#)
- [Task 14, "Configuring Coherence Clusters"](#)

- [Task 15, "Verifying the Existing Machines"](#)
- [Task 16, "Assigning Servers to Machines"](#)
- [Task 17, "Configuring Virtual Targets"](#)
- [Task 18, "Configuring Partitions"](#)
- [Task 19, "Configuring File Store"](#)
- [Task 20, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 21, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 22, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the `ASERVER_HOME` variable, which represents the complete path to the Administration Server domain home you created when you created in [Creating the Initial Infrastructure Domain for an Enterprise Deployment](#).

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#)

For more information about the other options on this screen, see Configuration Type in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle SOA Suite - 12.2.1.2.0 [soa]**

The following additional templates should already be selected, because they were used to create the initial domain:

- Oracle Enterprise Manager - 12.2.1.2.0 [em]
- Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]
- Oracle JRF - 12.2.1.2.0 [oracle_common]
- WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]

And the following template should also be selected, because you already configured WebCenter Content:

- Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wccontent]

For more information about the options on this screen, see Templates in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see Understanding the Service Table Schema in *Oracle Fusion Middleware Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see Datasource Defaults in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

On the JDBC Component Schema screen, select all the SOA schemas in the table.

When you select the schemas, the fields on the page are activated and the database connection fields are populated automatically.

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, provide the information required to connect to the RAC database and component schemas, as shown in the following table.

Element	Description and Recommended Value
SCAN, Host Name, and Port	Select the SCAN check box. In the Host Name field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database. In the Port field, enter the SCAN listening port for the database (for example, 1521)
ONS Host and Port	In the ONS Host field, enter the SCAN address for the Oracle RAC database. In the Port field, enter the ONS Remote port (typically, 6200).
Enable Fan	Verify that the Enable Fan check box is selected, so the database can receive and process FAN events.

Task 6 Testing the JDBC Connections

Use the JDBC Component Schema Test screen to test the data source connections you have just configured.

A green check mark in the **Status** column indicates a successful test. If you encounter any issues, see the error message in the Connection Result Log section of the screen, fix the problem, then try to test the connection again.

For more information about the other options on this screen, see Test Component Schema in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Keystore

Use this screen to specify details about the keystore to be used in the domain.

For a typical enterprise deployment, you can leave the default values.

For more information, see Keystore in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 8 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
Add, Delete, or Modify Settings for Server Templates, Managed Servers, Clusters, Virtual Targets, and Coherence.
- **File Store**

Task 9 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server for Oracle SOA Suite appears in the list of servers. This server was created automatically by the Oracle SOA Suite configuration template you selected in [Task 2, "Selecting the Configuration Template"](#).

Perform the following tasks to modify the default Oracle SOA Suite Managed Server and create a second Oracle SOA Suite Managed Server:

1. Rename the default Oracle SOA Suite Managed Server to WLS_SOA1.
2. Click **Add** to create a new Oracle SOA Suite Managed Server, and name it WLS_SOA2.

Tip:

The server names recommended here will be used throughout this document; if you choose different names, be sure to replace them as needed.

3. Use the information in [#unique_251/unique_251_Connect_42_GUID-579F94E8-DCA0-486A-B006-5555CCB429F9](#) to fill in the rest of the columns for each Oracle SOA Suite Managed Server.

For more information about the options on the Managed Server screen, see Managed Servers in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Groups
WLS_SOA1	WCCHOST1	8001	No	Disabled	SOA-MGD-SVRS-ONLY, WSMPM-MAN-SVR, WSM-CACHE-SVR, JRF-MAN-SVR
WLS_SOA2	WCCHOST2	8001	No	Disabled	SOA-MGD-SVRS-ONLY, WSMPM-MAN-SVR, WSM-CACHE-SVR, JRF-MAN-SVR

Task 10 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle SOA Suite software.

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `SOA_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `Unspecified`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to Considerations for Choosing Unicast or Multicast in *Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

For more information about the options on this screen, see Clusters in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 11 Assigning Server Templates

Click **Next** to continue.

Task 12 Configuring Dynamic Servers

Verify that all dynamic server options are disabled for clusters that are to remain as static clusters.

1. Confirm that the **Dynamic Cluster**, **Calculated Listen Port**, and **Calculated Machine Names** checkboxes on this screen are unchecked.
2. Confirm the **Server Template** selection is **Unspecified**.
3. Click **Next**.

Task 13 Assigning Managed Servers to the Cluster

Use the Assign Servers to Clusters screen to assign `WLS_SOA1` and `WLS_SOA2` to the new cluster `SOA_Cluster`:

1. In the Clusters pane, select the cluster to which you want to assign the servers; in this case, `SOA_Cluster`.
2. In the Servers pane, assign `WLS_SOA1` to `SOA_Cluster` by doing one of the following:
 - Click `WLS_SOA1` Managed Server once to select it, and then click on the right arrow to move it beneath the selected cluster in the Clusters pane.
 - Double-click `WLS_SOA1` to move it beneath the selected cluster in the clusters pane.
3. Repeat to assign `WLS_SOA2` to `SOA_Cluster`.

For more information about the options on this screen, see *Assign Servers to Clusters* in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 14 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 9991, as it was defined during the initial Infrastructure domain creation.

For Coherence licensing information, see Oracle Coherence Products in *Oracle Fusion Middleware Licensing Information User Manual*.

Task 15 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed.

Task 16 Assigning Servers to Machines

Use the Assign Servers to Machines screen to assign the Oracle SOA Suite Managed Servers you just created to the corresponding machines in the domain.

Assign `WLS_SOA1` to `WCCHOST1`, and assign `WLS_SOA2` to `WCCHOST2`.

For more information about the options on this screen, see *Assign Servers to Machines* in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 17 Configuring Virtual Targets

Click **Next** to proceed to the next screen.

Task 18 Configuring Partitions

Click **Next** to proceed to the next screen.

Task 19 Configuring File Store

In the JMS File Stores screen, assign the following directory for each of the SOA Persistence stores, including UMS and BPM file stores:

```
ORACLE_RUNTIME/domain_name/SOA_Cluster/jms
```

Note: Create the `jms` folder before starting the managed servers.

In this example, replace `ORACLE_RUNTIME` with the value of the variable for your environment. Replace `domain_name` with the name you assigned to the domain. Replace `SOA_Cluster` with the name you assigned to the cluster.

Task 20 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

For more information about the options on this screen, see *Configuration Summary* in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 21 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured, including:

- Domain Location
- Administration Server URL

Make a note of both these items, because you will need them later; you will need the domain location to access the scripts used to start the Administration Server, and you will need the Administration Server URL to access the WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control.

Click **Finish** to dismiss the Configuration Wizard.

Task 22 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

After you have completed extending the domain with static clusters, go to [Configuring a Default Persistence Store for Transaction Recovery](#).

13.5.2.2 Extending the Domain with Dynamic Clusters

Follow the instructions in this section to create and configure the domain for the topology with dynamic clusters.

Note:

You can use the same procedure described in this section to extend an existing domain with dynamic clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks.

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying the Database Configuration Type"](#)
- [Task 4, "Specifying JDBC Component Schema Information"](#)
- [Task 5, "Providing the GridLink Oracle RAC Database Connection Details"](#)
- [Task 6, "Testing the JDBC Connections"](#)
- [Task 7, "Keystore"](#)
- [Task 8, "Selecting Advanced Configuration"](#)
- [Task 9, "Configuring Managed Servers"](#)
- [Task 10, "Configuring a Cluster"](#)
- [Task 11, "Assigning Server Templates"](#)
- [Task 12, "Configuring Dynamic Servers"](#)
- [Task 13, "Configuring Coherence Clusters"](#)
- [Task 14, "Verifying the Existing Machines"](#)
- [Task 15, "Assigning Servers to Machines"](#)
- [Task 16, "Virtual Targets"](#)
- [Task 17, "Partitions"](#)
- [Task 18, "Configuring File Store"](#)
- [Task 19, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 20, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 21, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the *ASERVER_HOME* variable, which represents the complete path to the Administration Server domain home you created when you created the initial domain.

Do not enter the value of the *MSERVER_HOME* variable, which represents the location of the Managed Servers domain directory.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#)

Tip:

More information about the other options on this screen can be found in Configuration Type in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle SOA Suite - 12.2.1.2.0 [soa]**

The following additional templates should already be selected, because they were used to create the initial domain:

- Oracle Enterprise Manager - 12.2.1.2.0 [em]
- Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]
- Oracle JRF - 12.2.1.2.0 [oracle_common]
- WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]

And the following template should also be selected, because you already configured WebCenter Content:

- Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wcccontent]

Tip:

More information about the options on this screen can be found in Templates in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see Understanding the Service Table Schema in *Oracle Fusion Middleware Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see Datasource Defaults in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

On the JDBC Component Schema screen, select all the SOA schemas in the table.

When you select the schemas, the fields on the page are activated and the database connection fields are populated automatically.

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, provide the information required to connect to the RAC database and component schemas, as shown in the following table.

Element	Description and Recommended Value
SCAN, Host Name, and Port	Select the SCAN check box. In the Host Name field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database. In the Port field, enter the SCAN listening port for the database (for example, 1521)
ONS Host and Port	In the ONS Host field, enter the SCAN address for the Oracle RAC database. In the Port field, enter the ONS Remote port (typically, 6200).
Enable Fan	Verify that the Enable Fan check box is selected, so the database can receive and process FAN events.

Task 6 Testing the JDBC Connections

Use the JDBC Component Schema Test screen to test the data source connections you have just configured.

A green check mark in the **Status** column indicates a successful test. If you encounter any issues, see the error message in the Connection Result Log section of the screen, fix the problem, then try to test the connection again.

Tip:

For more information about the other options on this screen, see Test Component Schema in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Keystore

Use this screen to specify details about the keystore to be used in the domain.

For a typical enterprise deployment, you can leave the default values.

For more information, see *Keystore* in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 8 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
- **File Store**

Task 9 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server for Oracle SOA Suite appears in the list of servers. This server was created automatically by the Oracle SOA Suite configuration template you selected in [Task 2, "Selecting the Configuration Template"](#).

Perform the following tasks to modify the default Oracle SOA Suite Managed Server and create a second Oracle SOA Suite Managed Server:

1. Delete the default Managed Server.
2. Click **Next**.

Task 10 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle SOA Suite software.

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `SOA_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `SOA-DYN-CLUSTER`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to *Considerations for Choosing Unicast or Multicast* in *Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in *Clusters* in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 11 Assigning Server Templates

Use the Server Templates screen to add a template:

1. Specify `SOA-server-template` in the **Name** field.

2. Specify 8000 in the **Listen Port** field.
3. Leave the **Enable SSL** option unchecked.
4. From the **Cluster** drop-down list, select `SOA_Cluster`.
5. Click **Next** .

Task 12 Configuring Dynamic Servers

Use the Dynamic Clusters screen to configure the required clusters:

1. Specify `SOA_Cluster` in the **Cluster Name** field.
2. Specify `WLS_SOA` in the **Server Name Prefix** field.
3. From the **Server Template** drop-down list, select `SOA-server-template`.
4. Specify 2 in the **Maximum Dynamic Server Count** field.
5. Specify in the **Machine Name Match Expression** field.
6. Select the **Calculated Machine Names** and **Dynamic Cluster** fields.
7. Click **Next** .

Task 13 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 9991, as it was defined during the initial Infrastructure domain creation.

Note:

For Coherence licensing information, see Oracle Coherence Products in *Oracle Fusion Middleware Licensing Information User Manual*.

Task 14 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed to the next screen.

Task 15 Assigning Servers to Machines

Click **Next** to proceed to the next screen.

Task 16 Virtual Targets

Click **Next** to proceed to the next screen.

Task 17 Partitions

Click **Next** to proceed to the next screen.

Task 18 Configuring File Store

In the File Stores screen, assign the following directory for each of the SOA Persistence stores, including UMS and BPM file stores:

```
ORACLE_RUNTIME/domain_name/soa_cluster/jms
```

Note: Create the `jms` folder before starting the managed servers.

In this example, replace `ORACLE_RUNTIME` with the value of the variable for your environment. Replace `domain_name` with the name you assigned to the domain. Replace `soa_cluster` with the name you assigned to the cluster.

Task 19 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Oracle Fusion Middleware Creating WebLogic Domains Using the Configuration Wizard*.

Task 20 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured, including:

- Domain Location
- Administration Server URL

Make a note of both these items, because you will need them later; you will need the domain location to access the scripts used to start the Administration Server, and you will need the Administration Server URL to access the WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control.

Click **Finish** to dismiss the configuration wizard.

Task 21 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

13.6 Configuring a Default Persistence Store for Transaction Recovery

Oracle WebLogic Server uses the transaction logs to recover from system crashes or network failures.

Note: This option is applicable only for static clusters.

Each Managed Server uses a transaction log that stores information about committed transactions that are coordinated by the server and that may not have been completed. Oracle WebLogic Server uses this transaction log for recovery from system crashes or network failures. To leverage the migration capability of the Transaction Recovery Service for the Managed Servers within a cluster, store the transaction log in a location accessible to each Managed Server and its backup server.

Note:

To enable migration of the Transaction Recovery Service, specify a location on a persistent storage solution that is available to other servers in the cluster. All Managed Servers in the cluster must be able to access this directory. This directory must also exist before you restart the server.

The recommended location is a dual-ported SCSI disk or on a Storage Area Network (SAN). Note that it is important to set the appropriate replication and backup mechanisms at the storage level to guarantee protection in cases of a storage failure.

This information applies for file-based transaction logs. You can also configure a database-based persistent store for transaction logs. For more information, see [Using JDBC Persistent Stores for TLOGs and JMS in an Enterprise Deployment](#).

To set the location for the default persistence stores:

1. Log into the Oracle WebLogic Server Administration Console:

```
ADMINVHN:7001/console
```

2. In the Change Center section, click **Lock & Edit**.

3. For each of the Managed Servers in the cluster:

- a. In the Domain Structure window, expand the **Environment** node, and then click the **Servers** node.

The Summary of Servers page appears.

- b. Click the name of the server (represented as a hyperlink) in **Name** column of the table.

The settings page for the selected server appears and defaults to the Configuration tab.

- c. On the Configuration tab, click the **Services** tab.

- d. In the Default Store section of the page, enter the path to the folder where the default persistent stores will store its data files.

For the enterprise deployment, use the `ORACLE_RUNTIME` directory location. This subdirectory serves as the central, shared location for transaction logs for the cluster. For more information, see [File System and Directory Variables Used in This Guide](#).

For example:

```
ORACLE_RUNTIME/domain_name/cluster_name/tlogs
```

In this example, replace *ORACLE_RUNTIME* with the value of the variable for your environment. Replace *domain_name* with the name you assigned to the domain. Replace *cluster_name* with the name of the cluster you just created.

- e. Click **Save**.
4. Complete step 3 for all servers in the SOA_Cluster.
5. Click **Activate Changes**.
6. Complete steps 1 through 5 for the other servers in the cluster.

Note:

You will validate the location and the creation of the transaction logs later in the configuration procedure.

13.7 Propagating the Extended Domain to the Domain Directories and Machines

After you have extended the domain with the Oracle WebCenter Content instances, and you have restarted the Administration Server on WCCHOST1, you must then propagate the domain changes to the domain directories and machines.

[Table 13-1](#) summarizes the steps required to propagate the changes to all the domain directories and machines.

Note that there is no need to propagate the updated domain to the WEBHOST1 and WEBHOST2 machines because there are no changes to the Oracle HTTP Server instances on those host computers.

Table 13-1 Summary of Tasks Required to Propagate the Domain Changes to Domain Directories and Machines

Task	Description	More Information
Pack up the Extended Domain on WCCHOST1	Use the pack command to create a new template JAR file that contains the new Oracle SOA Suite Managed Servers configuration. When you pack up the domain, create a template JAR file called <code>wccdomaintemplateExtSOA.jar</code> .	Packing Up the Extended Domain on WCCHOST1
Unpack the Domain in the Managed Servers directory on WCCHOST1	Unpack the template JAR file in the Managed Servers directory on WCCHOST1 local storage.	Unpacking the Domain in the Managed Servers Domain Directory on WCCHOST1
Unpack the Domain on WCCHOST2	Unpack the template JAR file in the Managed Servers directory on the WCCHOST2local storage.	Unpacking the Domain on WCCHOST2

[Packing Up the Extended Domain on WCCHOST1](#)

Unpacking the Domain in the Managed Servers Domain Directory on WCCHOST1

Unpacking the Domain on WCCHOST2

13.7.1 Packing Up the Extended Domain on WCCHOST1

Use the following steps to create a template JAR file that contains the domain configuration information:

1. Log in to WCCHOST1 and run the pack command to create a template JAR file as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./pack.sh -managed=true
         -domain=ASERVER_HOME
         -template=full_path/wccdomaintemplateExtSOA.jar
         -template_name=wcc_domain_template_extension_soa
```

In this example:

- Replace *ASERVER_HOME* with the actual path to the domain directory you created on the shared storage device.
 - Replace *full_path* with the complete path to the directory where you want the template jar file saved.
 - *wccdomaintemplateExtSOA.jar* is a sample name for the JAR file you are creating, which will contain the domain configuration files, including the configuration files for the Oracle HTTP Server instances.
 - *wcc_domain_template_extension_soa* is the name assigned to the domain template file.
2. Make a note of the location of the template JAR file you just created with the pack command.

Tip:

For more information about the pack and unpack commands, see Overview of the Pack and Unpack Commands in *Oracle Fusion Middleware Creating Templates and Domains Using the Pack and Unpack Commands*.

13.7.2 Unpacking the Domain in the Managed Servers Domain Directory on WCCHOST1

To copy the updated domain configuration information from the Administration Server domain directory to the Managed Servers domain directory:

1. Log in to WCCHOST1 if you haven't already.
2. If you haven't already, create the recommended directory structure for the Managed Server domain on the WCCHOST1 local storage device.

Use the examples in [File System and Directory Variables Used in This Guide](#) as a guide.

3. Run the unpack command to unpack the template in the domain directory onto the local storage, as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME \
  -template=full_path/wccdomaintemplateExtSOA.jar \
  -overwrite_domain=true \
  -app_dir=APPLICATION_HOME
```

In this example:

- Replace `MSERVER_HOME` with the complete path to the domain home to be created on the local storage disk. This is the location where the copy of the domain will be unpacked.
- `wccdomaintemplateExtSOA.jar` is the directory path and name of the template you created when you ran the `pack` command to pack up the domain on the shared storage device.
- The `-overwrite_domain=true` argument is necessary when you are unpacking a Managed Server template into an existing domain and existing applications directories.

For any file that is overwritten, a backup copy of the original is created. If any modifications have been applied to the start scripts and EAR files in the Managed Server domain directory, they must be restored after this unpack operation.

- Replace `APPLICATION_HOME` with the complete path to the applications directory for the domain on local storage.

Tip:

For more information about the `pack` and `unpack` commands, see "Overview of the Pack and Unpack Commands" in *Creating Templates and Domains Using the Pack and Unpack Commands*.

4. Change directory to the newly created `MSERVER_HOME` directory and verify that the domain configuration files were copied to the correct location on the WCCHOST1 local storage device.

13.7.3 Unpacking the Domain on WCCHOST2

This procedure assumes you have copied the file that you created earlier in a location that is accessible from both WCCHOST1 and WCCHOST2; such as the `MSERVER_HOME` directory, which is located on the shared storage filer:

1. Log in to WCCHOST2.
2. If you haven't already, create the recommended directory structure for the Managed Server domain on the WCCHOST2 storage device.

Use the examples in [File System and Directory Variables Used in This Guide](#) as a guide.

3. Make sure the `wccdomaintemplate.jar` accessible to WCCHOST2.

For example, if you are using a separate shared storage volume or partition for WCCHOST2, then copy the template to the volume or partition mounted to WCCHOST2.

4. Run the `unpack` command to unpack the template in the domain directory onto the local storage, as follows:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME
            -overwrite_domain=true
            -template=complete_path/wccdomaintemplateExtSOA.jar
            -log_priority=DEBUG
            -log=/tmp/unpack.log
            -app_dir=APPLICATION_HOME
```

In this example:

- Replace `MSERVER_HOME` with the complete path to the domain home to be created on the local storage disk. This is the location where the copy of the domain will be unpacked.
- Replace `complete_path/wccdomaintemplateExtSOA.jar` with the complete path and file name of the domain template jar file that you created when you ran the `pack` command to pack up the domain on the shared storage device.
- Replace `APPLICATION_HOME` with the complete path to the Application directory for the domain on shared storage. For more information, see [File System and Directory Variables Used in This Guide](#).

Tip:

For more information about the `pack` and `unpack` commands, see [Overview of the Pack and Unpack Commands in Oracle Fusion Middleware Creating Templates and Domains Using the Pack and Unpack Commands](#).

5. Change directory to the newly created `MSERVER_HOME` directory and verify that the domain configuration files were copied to the correct location on the `WCCHOST2` local storage device.

13.8 Updating the NodeManager Configuration After Unpacking the Domain

When extending a domain after setting up custom keystores, certificates, and custom identity aliases, the `nodemanager.properties` file in `MSERVER_HOME` may be overwritten with some values from the `nodemanager.properties` file for `ASERVER_HOME`. Specifically, the `ListenAddress` and/or `CustomIdentityAlias` values can be reset.

Notes::

- The `ListenAddress` may typically get reset on the `MSERVER_HOME` `nodemanager` residing on the same host as the `ASERVER_HOME` `nodemanager`. In this topology, `WCCHOST1`.
 - In the previous chapters, prior to [Enabling SSL Communication Between the SOA Servers and the Hardware Load Balancer](#), steps 2 through 4 regarding the `CustomIdentityAlias` may not be applicable.
-
-

For the `MSERVER_HOME/nodemanager/nodemanager.properties` file on each host:

1. Verify the correct `ListenAddress` parameter value and reset it, if required.

```
grep ListenAddress MSERVER_HOME/nodemanager/nodemanager.properties
```

2. Confirm the list of configured Identity Aliases from the domain configuration file as a reference for the next command.

```
grep server-private-key-alias ASERVER_HOME/config/config.xml | sort | uniq
```

3. Verify the current `CustomIdentityAlias` parameter value.

```
grep CustomIdentityAlias MSERVER_HOME/nodemanager/nodemanager.properties
```

4. Reset the `CustomIdentityAlias` parameter value to the correct alias string appropriate for the current host, if required.

5. Restart the nodemanager process:

```
kill `ps -eaf | grep weblogic.NodeManager | grep MSERVER_HOME | grep -v grep |`
awk '{print $2}' `
nohup MSERVER_HOME/bin/startNodeManager.sh > MSERVER_HOME/nodemanager/
nodemanager.out 2>&1 &
```

For more information, see [Configuring Node Manager to Use the Custom Keystores](#).

13.9 Modifying the Upload and Stage Directories to an Absolute Path

After configuring the domain and unpacking it to the Managed Server domain directories on all the hosts, verify and update the upload and stage directories for Managed Servers in the new clusters. If implementing dynamic clusters, the configuration of the server template assigned to each newly added cluster should be verified and updated, otherwise, verify and update every statically-defined Managed Server for the newly added clusters.

Note: This option is applicable only for static clusters.

This step is necessary to avoid potential issues when performing remote deployments and for deployments that require the stage mode.

To update these directory paths for all the Managed Servers in the Managed Server domain home directory:

1. Log in to the Oracle WebLogic Server Administration Console.
2. In the left navigation tree, expand **Domain**, and then **Environment**.
3. Click **Lock & Edit**.
4. Navigate to and edit the appropriate objects for your cluster type.
 - a. For Static Clusters, navigate to Servers and click on the name of the Managed Server to be edited.
 - b. For Dynamic Clusters, navigate to **Clusters > Server Templates**, and click on the name of the server template to be edited.

5. For each new Managed Server or Server Template to be edited:
 - a. Click the **Configuration** tab, and then click the **Deployment** tab.
 - b. Verify that the **Staging Directory Name** is set to the following:


```
MSERVER_HOME/servers/server_or_template_name/stage
```

Replace *MSERVER_HOME* with the directory path for the *MSERVER_HOME* directory; If using static clusters, update with the correct name of the Managed Server you are editing.

If using dynamic clusters, leave the template name intact.

For example: /u02/oracle/config/domains/wcedg_domain/servers/XYZ-server-template/stage
 - c. Update the **Upload Directory Name** to the following value:


```
ASERVER_HOME/servers/AdminServer/upload
```

Replace *ASERVER_HOME* with the directory path for the *ASERVER_HOME* directory.
 - d. Click **Save**.
 - e. Return to the Summary of Servers or Summary of Server Templates screen as applicable.
6. When you have modified all of the appropriate objects, click **Activate Changes**.
7. Restart all Managed Servers effected by these change.

13.10 Starting and Validating the WLS_SOA1 Managed Server

Now that you have extended the domain, started the Administration Server, and propagated the domain to the other hosts, you can start the newly configured Oracle SOA Suite Managed Servers.

This process involves three tasks as described in the following sections.

[Starting the WLS_SOA1 Managed Server](#)

[Adding the SOAAdmin Role to the Administrators Group](#)

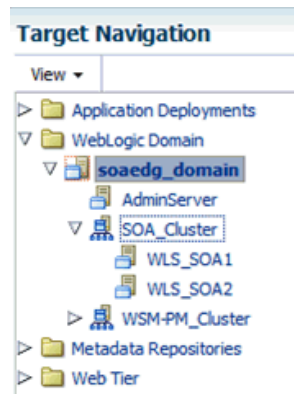
[Validating the Managed Server by Logging in to the SOA Infrastructure](#)

13.10.1 Starting the WLS_SOA1 Managed Server

To start the WLS_SOA1 Managed Server:

1. Enter the following URL into a browser to display the Fusion Middleware Control login screen:


```
http://ADMINVHN:7001/em
```
2. Log in to Fusion Middleware Control using the Administration Server credentials.
3. In the **Target Navigation** pane, expand the domain to view the Managed Servers in the domain.



4. Select only the **WLS_SOA1** Managed Server and click **Start Up** on the Oracle WebLogic Server toolbar.

Note:

SOA Servers depend on the policy access service to be functional. This implies that the WSM-PM Managed Servers in the domain need to be up and running and reachable before the SOA servers are started.

5. When the startup operation is complete, navigate to the Domain home page and verify that the WLS_SOA1 Managed Server is up and running.

13.10.2 Adding the SOAdmin Role to the Administrators Group

Before you validate the Oracle SOA Suite configuration on the WLS_SOA1 Managed Server, add the SOAdmin administration role to the enterprise deployment administration group (WCCAdministrators).

To perform this task, refer to [Configuring Roles for Administration of an Enterprise Deployment](#).

13.10.3 Validating the Managed Server by Logging in to the SOA Infrastructure

After you add the SOAdmin role to the SOA Administrators group, you can then validate the configuration of the Oracle SOA Suite software on the WLS_SOA1 Managed Server as follows:

1. Use your Web browser to navigate to the following URL:

```
http://WCCHOST1:8001/soa-infra/
```

2. Log in using the enterprise deployment administrator user credentials (weblogic_wcc).

You should see a web page with the following title:

```
"Welcome to the Oracle SOA Platform on WebLogic"
```

13.11 Starting and Validating the WLS_SOA2 Managed Server

After validating the successful configuration and startup of the WLS_SOA1 Managed Server, you can start and validate the WLS_SOA2 Managed Server.

To start and validate the WLS_SOA2 Managed Server, use the procedure in [Starting and Validating the WLS_SOA1 Managed Server](#) for WLS_SOA2 Managed Server.

For the validation URL, enter the following URL in your web browser and log in using the enterprise deployment administrator user (`weblogic_soa`):

```
http://WCCHOST2:8001/soa-infra/
```

13.12 Validating the Location and Creation of the Transaction Logs

After WLS_SOA1 and WLS_SOA2 are up and running, verify that the transaction log directory and transaction logs were created as expected.

Run the following command to verify, based on the steps you performed in [Configuring a Default Persistence Store for Transaction Recovery](#):

```
ls -al ORACLE_RUNTIME/domain_name/cluster_name/tlogs
```

- `_WLS_WLS_SOA1000000.DAT`
- `_WLS_WLS_SOA2000000.DAT`

13.13 Configuring Oracle HTTP Server for the Extended Domain

The following sections describe how to configure the Oracle HTTP Server instances so they route requests for both public and internal URLs to the proper clusters in the enterprise topology.

[Configuring Oracle HTTP Server for SOA in an Oracle WebCenter Content Enterprise Deployment](#)

[Configuring the WebLogic Proxy Plug-In](#)

[Validating the Oracle SOA Suite URLs Through the Load Balancer](#)

13.13.1 Configuring Oracle HTTP Server for SOA in an Oracle WebCenter Content Enterprise Deployment

Configure the virtual host configuration files so that requests are routed properly to the Oracle SOA Suite clusters:

1. Log in to WEBHOST1 and change directory to the configuration directory for the first Oracle HTTP Server instance (`ohs1`):

```
cd OHS_DOMAIN_HOME/config/fmwconfig/components/OHS/ohs1/moduleconf/
```

2. Edit the `wccinternal_vh.conf` file and add the following directives inside the `<VirtualHost>` tags:

Note:

The URL entry for `/workflow` is optional. It is for workflow tasks associated with Oracle ADF task forms. The `/workflow` URL itself can be a different value, depending on the form.

```
# soa-infra
<Location /soa-infra>
    WLSRequest ON
```

```

        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # SOA inspection.wsil
    <Location /inspection.wsil>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # Worklist
    <Location /integration>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # UMS prefs
    <Location /sdpmessaging/userprefs-ui>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # Default to-do taskflow
    <Location /DefaultToDoTaskFlow>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # Workflow
    <Location /workflow>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    #Required if attachments are added for workflow tasks
    <Location /ADFAttachmentHelper>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # SOA composer application
    <Location /soa/composer>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

```

```

<Location /frevvo>
  WLSRequest ON
  WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
  WLProxySSL OFF
  WLProxySSLPassThrough OFF
</Location>
</VirtualHost>

```

3. Copy the `wccinternal_vh.conf` to the configuration directory for the second Oracle HTTP Server instance (`ohs2`):

```
OHS_DOMAIN_HOME/config/fmwconfig/components/ohs2/moduleconf/
```

4. Edit the `wccinternal_vh.conf` to change any references to `WEBHOST1` to `WEBHOST2` in the `<VirtualHost>` directives.
5. Restart both Oracle HTTP servers.

Example 13-1 Sample Content for the `wccinternal_vh.conf` File

```

<VirtualHost WEBHOST1:7777>
  ServerName http://wccinternal.example.com:80
  ServerAdmin you@your.address
  RewriteEngine On
  RewriteOptions inherit

# WSM-PM
<Location /wsm-pm>
  WebLogicCluster WCPHOST1:7010,WCPHOST2:7010
  WLSRequest ON
  WLProxySSL OFF
  WLProxySSLPassThrough OFF
</Location>

#soa-infra
<Location /soa-infra>
  WLSRequest ON
  WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
  WLProxySSL OFF
  WLProxySSLPassThrough OFF
</Location>

# SOA inspection.wsil
<Location /inspection.wsil>
  WLSRequest ON
  WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
  WLProxySSL OFF
  WLProxySSLPassThrough OFF
</Location>

# Worklist
<Location /integration>
  WLSRequest ON
  WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
  WLProxySSL OFF
  WLProxySSLPassThrough OFF
</Location>

# UMS prefs
<Location /sdpmessaging/userprefs-ui>
  WLSRequest ON

```

```
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # Default to-do taskflow
    <Location /DefaultToDoTaskFlow>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # Workflow
    <Location /workflow>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    #Required if attachments are added for workflow tasks
    <Location /ADFAttachmentHelper>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    # SOA composer application
    <Location /soa/composer>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>

    <Location /frevvo>
        WLSRequest ON
        WebLogicCluster WCCHOST1:8001,WCCHOST2:8001
        WLProxySSL OFF
        WLProxySSLPassThrough OFF
    </Location>
</VirtualHost>
```

13.13.2 Configuring the WebLogic Proxy Plug-In

Before you can validate that requests are routed correctly through the Oracle HTTP Server instances, you must set the `WebLogic Plug-In Enabled` parameter for the clusters you just configured.

1. Log in to the Oracle WebLogic Server Administration Console.
2. In the **Domain Structure** pane, expand the **Environment** node.
3. Click **Lock & Edit** in the Change Center.
4. Click **Clusters**.

5. Select the cluster to which you want to proxy requests from Oracle HTTP Server.
The **Configuration: General** tab is displayed.
6. Scroll down to the **Advanced** section and expand it.
7. Set **WebLogic Plug-In Enabled** to **yes**.
8. Click **Save**.
9. If more than one cluster was deployed for the latest domain extension, repeat steps 4 through 8 until all the clusters are consistently updated.
10. Click **Activate Changes** in the Change Center.

13.13.3 Validating the Oracle SOA Suite URLs Through the Load Balancer

To validate the configuration of the Oracle HTTP Server virtual hosts and to verify that the hardware load balancer can route requests through the Oracle HTTP Server instances to the application tier:

1. Verify that the server status is reported as **Running** in the Administration Console.
If the server is shown as **Starting** or **Resuming**, wait for the server status to change to **Started**. If another status is reported (such as **Admin** or **Failed**), check the server output log files for errors.
2. Verify that you can access these URLs:
 - `http://wccinternal.example.com/soa-infra`
 - `http://wccinternal.example.com/integration/worklistapp`
 - `http://wccinternal.example.com/sdpMessaging/userprefs-ui`
 - `http://wccinternal.example.com/soa/composer`
 - `http://wccinternal.example.com/wsm-pm`

13.14 Post-Configuration Steps for Oracle SOA Suite

After you install and configure Oracle SOA Suite, consider the following post-configuration tasks.

[Enabling SSL Communication Between the SOA Servers and the Hardware Load Balancer](#)

[Considerations for sync-async interactions in a SOA cluster](#)

13.14.1 Enabling SSL Communication Between the SOA Servers and the Hardware Load Balancer

After you extend the domain with Oracle SOA Suite, you should also ensure that the Administration Server and Managed Servers can access the front-end, SSL URL of the hardware load balancer.

This will allow SOA Composite applications and web services to invoke callbacks and other communications with the front-end, secure URL.

For more information, see [Enabling SSL Communication Between the Middle Tier and the Hardware Load Balancer](#).

13.14.2 Considerations for sync-async interactions in a SOA cluster

In a SOA cluster, the following scenarios are not supported:

- Synchronous BPEL process with mid-process receive.
- Synchronous BPEL process calling asynchronous services.
- Callback from synchronous processes.

13.15 Enabling Automatic Service Migration and JDBC Persistent Stores for Oracle SOA Suite

To ensure that Oracle SOA Suite is configured for high availability, configure the Oracle SOA Suite Managed Servers for automatic service migration.

For more information on enabling automatic service migration, see [Configuring Automatic Service Migration in an Enterprise Deployment](#).

For additional high availability, you can also configure your transaction logs store and JMS store in a database. For more information, see [Using JDBC Persistent Stores for TLOGs and JMS in an Enterprise Deployment](#).

Extending the Domain to Include Inbound Refinery

You need to perform certain tasks in order to extend the enterprise deployment domain to include Inbound Refinery software.

[Overview of Extending the Domain to Include Inbound Refinery](#)

Inbound Refinery is required for document conversion by Oracle WebCenter Content Server.

[Extending the Domain for Inbound Refinery](#)

The instructions for extending the existing enterprise deployment domain with the Inbound Refinery software are detailed in this section.

[Completing Postconfiguration and Verification Tasks for Inbound Refinery](#)

After extending the domain with the Inbound Refinery software, consider the following post-configuration and verification tasks.

[Configuring the Inbound Refinery Managed Servers](#)

To initialize the configuration of an Inbound Refinery Managed Server, you need to access it only once through HTTP. You can do this directly at the Managed Server's listen address. An Inbound Refinery instance should not be placed behind an HTTP server.

[Validating the Configuration of the Inbound Refinery Managed Servers](#)

To ensure that the Inbound Refinery Managed Servers you have created are properly configured, validate the configuration by logging in to Content Server and verifying that a file with an extension recognized as valid for conversion is correctly converted.

14.1 Overview of Extending the Domain to Include Inbound Refinery

Inbound Refinery is required for document conversion by Oracle WebCenter Content Server.

The actual number of Inbound Refinery Managed Servers varies depending on requirements. For availability reasons, Oracle recommends configuring at least two Inbound Refinery Managed Servers, each installed and configured on a separate machine. In the reference Oracle WebCenter Content enterprise deployment topology, Inbound Refinery will be configured on the same machine as Content Server.

Even though multiple Managed Servers are created in the process of extending the domain with Inbound Refinery in this enterprise deployment topology, each Inbound Refinery instance is completely independent. Inbound Refinery does not run in a cluster.

14.2 Extending the Domain for Inbound Refinery

The instructions for extending the existing enterprise deployment domain with the Inbound Refinery software are detailed in this section.

[Starting the Configuration Wizard](#)

[Navigating the Configuration Wizard Screens to Extend the Domain](#)

14.2.1 Starting the Configuration Wizard

To start the Configuration Wizard:

1. From the WebLogic Server Console, stop any managed servers that will be modified by this domain extension. Managed Servers that are not effected can remain on-line.
2. For any managed servers to be modified, verify the managed server shutdown has completed.
3. Stop the Administration Server once all managed servers are in a steady state.
4. Navigate to the following directory and start the WebLogic Server Configuration Wizard.

```
cd ORACLE_HOME/oracle_common/common/bin
./config.sh
```

14.2.2 Navigating the Configuration Wizard Screens to Extend the Domain

Follow the instructions in this section to update and configure the domain for the topology.

Note:

You can use the same procedure described in this section to extend an existing domain. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks:

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the *ASERVER_HOME* variable, which represents the complete path to the initial Administration Server domain home you created.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle Universal Content Management - Inbound Refinery - 12.2.1.2.0 [wcontent]**

The following additional templates should already be selected, because they were used to create the initial domain:

- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, click **Next**.

Task 4 Testing the JDBC Connections

Click **Next** to continue.

Task 5 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following option on the Advanced Configuration screen:

Topology**Task 6 Configuring Managed Servers**

On the Managed Servers screen, a new Managed Server appears in the list of servers.

Perform the following tasks to modify the default Managed Server and create a second Managed Server:

1. Rename the default Managed Server to `WLS_IBR1`.
2. Click **Add** to create a new Managed Server and name it `WLS_IBR2`.

Tip:

The server names recommended here will be used throughout this document. If you choose different names be sure to replace them as needed.

- Use the information in the following table to fill in the rest of the columns for each Managed Server.

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Group
WLS_IBR1	WCCHOST1	16250	No	Disabled	IBR-MGD-SVR
WLS_IBR2	WCCHOST2	16250	No	Disabled	IBR-MGD-SVR

Tip:

More information about the options on the Managed Server screen can be found in Managed Servers in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 7 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle Inbound Refinery software.

Use the Clusters screen to create a new cluster:

- Click the **Add** button.
- Specify `IBR_Servers` in the **Cluster Name** field.
- From the **Dynamic Server Groups** drop-down list, select `Unspecified`.
- Click **Next** to proceed to the next screen.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 8 Assigning Server Templates

Click **Next** to proceed to the next screen.

Task 9 Configuring Dynamic Servers

Verify that all dynamic server options are disabled for clusters that are to remain as static clusters.

- Confirm that the **Dynamic Cluster**, **Calculated Listen Port**, and **Calculated Machine Names** checkboxes on this screen are unchecked.
- Confirm the **Server Template** selection is **Unspecified**.
- Click **Next**.

Task 10 Assigning Managed Servers to the Cluster

Use the Assign Servers to Clusters screen to assign WLS_IBR1 and WLS_IBR2 to the new cluster IBR_Servers:

1. In the Clusters pane, select the cluster to which you want to assign the servers; in this case, IBR_Servers.
2. In the Servers pane, assign WLS_IBR1 to IBR_Servers by doing one of the following:
 - Click once on WLS_IBR1 Managed Server to select it, then click on the right arrow to move it beneath the selected cluster in the Clusters pane.
 - Double-click WLS_IBR1 to move it beneath the selected cluster in the clusters pane.
3. Repeat to assign WLS_IBR2 to IBR_Servers.

Tip:

More information about the options on this screen can be found in Assign Servers to Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 11 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 9991, as it was defined during the initial Infrastructure domain creation.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 12 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed.

Task 13 Assigning Servers to Machines

Use the Assign Servers to Machines screen to assign the Oracle Inbound Refinery Managed Servers you just created to the corresponding machines in the domain.

Assign WLS_IBR1 to WCCHOST1, and assign WLS_IBR2 to WCCHOST2.

Tip:

More information about the options on this screen can be found in Assign Servers to Machines in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 14 Reviewing Virtual Targets

Click **Next** to proceed to the next screen.

Task 15 Reviewing Partitions

Click **Next** to proceed to the next screen.

Task 16 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Click **Update** to execute the domain extension.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 17 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the Configuration Wizard.

Task 18 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

14.3 Completing Postconfiguration and Verification Tasks for Inbound Refinery

After extending the domain with the Inbound Refinery software, consider the following post-configuration and verification tasks.

[Propagate the Domain Configuration Updates for Inbound Refinery](#)

[Starting the Node Manager in the Managed Server Domain Directory](#)

[Starting the Inbound Refinery Managed Servers](#)

14.3.1 Propagate the Domain Configuration Updates for Inbound Refinery

Propagate the start scripts and classpath configuration from the Administration Server's domain directory to the Managed Server domain directory. To propagate the domain configuration to the Inbound Refinery Managed Servers:

1. Create a copy of the Managed Server domain directory and the Managed Server applications directory.
2. Run the following `pack` command on WCCHOST1 to create a template pack:

```
cd ORACLE_COMMON_HOME/common/bin

./pack.sh -managed=true -domain=ASERVER_HOME -
template=edgdomaintemplateExtIBR.jar -template_name=edgdomain_templateIBR
```

3. Run the following `unpack` command on WCCHOST1 to propagate the template created in the preceding step to the WLS_IBR1 domain directory:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateExtIBR.jar -
app_dir=APPLICATION_HOME -overwrite_domain=true
```

4. Run the following command on WCCHOST1 to copy the template pack created in step 1 to WCCHOST2:

```
scp edgdomaintemplateIBR.jar oracle@WCCHOST2:ORACLE_COMMON_HOME/common/bin
```

5. Run the `unpack` command on WCCHOST2 to unpack the propagated template to the WLS_IBR1 domain directory.

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateExtIBR.jar -
app_dir=APPLICATION_HOME -overwrite_domain=true
```

6. Restart the Administration Server to make these changes take effect, stopping it with the `nmKill` command, or with the Administration Console, and then starting it with the `nmStart` command. Log in to the Administration Console using the credentials for the `weblogic` user.

14.3.2 Starting the Node Manager in the Managed Server Domain Directory

Follow these steps to start the Node Manager from the Managed Server home:

1. On WCCHOST1, navigate to the following directory:

```
MSERVER_HOME/bin
```

2. Use the following command to start the Node Manager:

```
nohup ./startNodeManager.sh > ./nodemanager.out 2>&1 &
```

3. Change directory to the following directory on WCCHOST2 and repeat the preceding step.

```
MSERVER_HOME/bin
```

For information about additional Node Manager configuration options, see *Administering Node Manager for Oracle WebLogic Server*.

14.3.3 Starting the Inbound Refinery Managed Servers

To start the WLS_IBR1 Managed Server on WCCHOST1:

1. Log in to the Oracle WebLogic Server Administration Console as the `weblogic_wcc` user at:

`http://admin.example.com/console`
2. Start the WLS_IBR1 Managed Server through the Administration Console, as follows:
 - a. Expand the **Environment** node in the **Domain Structure** tree on the left.
 - b. Click **Servers**.
 - c. On the Summary of Servers page, click the **Control** tab.
 - d. Select **WLS_IBR1** from the **Servers** column of the table.
 - e. Click **Start**.
3. Verify that the server status is reported as `Running` in the Administration Console.
 - If the server is shown as `Starting` or `Resuming`, wait for the server status to change to `Started`.
 - If another status is reported (such as `Admin` or `Failed`), check the server output log files for errors.
4. Repeat the preceding steps to start the WLS_IBR2 Managed Server on WCCHOST2.

14.4 Configuring the Inbound Refinery Managed Servers

To initialize the configuration of an Inbound Refinery Managed Server, you need to access it only once through HTTP. You can do this directly at the Managed Server's listen address. An Inbound Refinery instance should not be placed behind an HTTP server.

All subsequent access to the Inbound Refinery instance is through the socket listener. This listener is protected through the incoming socket connection address security filter configured in the next section.

Oracle recommends configuring each Content Server instance with all Inbound Refinery instances. The process for configuring Content Server is to add each Inbound Refinery instance as a provider. You also need to perform some post-installation steps with Inbound Refinery.

The following sections describe the procedures for post-installation configuration of each Inbound Refinery instance.

[Configuring Inbound Refinery Settings](#)

After starting the Inbound Refinery Managed Servers, configure the settings for each server on its post-installation configuration screen.

[Setting Up Content Server to Send Jobs to Inbound Refinery for Conversion](#)

Before Oracle WebCenter Content Server can send jobs to Inbound Refinery for conversion, you need to perform the setup tasks described in the following sections for each Inbound Refinery Managed Server.

14.4.1 Configuring Inbound Refinery Settings

After starting the Inbound Refinery Managed Servers, configure the settings for each server on its post-installation configuration screen.

To configure the settings for each Inbound Refinery instance, complete the following steps:

1. Create the runtime cluster subdirectories required for the Oracle WebCenter Content Inbound Refinery shared folder configuration.

The Oracle WebCenter Content Inbound Refinery configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location of the Oracle WebCenter Content Inbound Refinery enterprise deployment is located at `ORACLE_RUNTIME/domain_name/IBR_Servers/`.

Run the following commands to create the required subdirectories for every IBR managed server:

```
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr1/vault
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr1/weblayout
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr1/data/users/profiles
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr2/vault
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr2/weblayout
mkdir -p ORACLE_RUNTIME/domain_name/IBR_Servers/ibr2/data/users/profiles
```

2. Access the Inbound Refinery post-installation configuration screen at the following URL, in which *N* is 1 or 2:

```
http://WCCHOSTN:16250/ibr/
```

3. On the Configuration screen, you will see **Inbound Refinery Instance Identifier: name**. Set the configuration settings for this instance as follows. Each Inbound Refinery instance is independent of the other instances and local to each machine. Use local directories for the configuration directories of each instance.

- **Inbound Refinery Instance Folder:** Set this to `ORACLE_RUNTIME/domain_name/IBR_Servers/ibrN`.

For example: `/u01/oracle/runtime/wccedg_domain/IBR_Servers/ibr1`

- **Native File Repository Location:** Set this to `ORACLE_RUNTIME/domain_name/IBR_Servers/ibrN/vault`.

For example: `/u01/oracle/runtime/wccedg_domain/IBR_Servers/ibr1/vault`

- **WebLayout Folder:** Set this to `ORACLE_RUNTIME/domain_name/IBR_Servers/ibrN/weblayout`.

For example: `/u01/oracle/runtime/wccedg_domain/IBR_Servers/ibr1/weblayout`

- **User Profile Folders:** Set this to `ORACLE_RUNTIME/domain_name/IBR_Servers/ibrN/data/users/profiles`.

For example: `/u01/oracle/runtime/wccedg_domain/IBR_Servers/ibr1/data/users/profiles`

- **Incoming Socket Connection Address Security Filter:** A pipe-delimited list of localhost and the server IP addresses:

```
127.0.0.1|WCCHOST1-IP|WCCHOST2-IP|WEBHOST1-IP|WEBHOST2-IP
```

This setting enables access from Content Server. The values for *WCCHOST1-IP* and *WCCHOST2-IP* should be the IP addresses of the machines with the Content Server instance or instances that will send jobs to Inbound Refinery, not necessarily the IP address of Inbound Refinery. (In the reference topology used in this enterprise deployment guide, however, these IP addresses are the same.)

The **Incoming Socket Connection Address Security Filter:** field accepts wildcards in the value; for example, 192.0.2.*.

You can change this value later by setting `SocketHostAddressSecurityFilter` in the `/u02/oracle/runtime/wccedg_domain/IBR_Servers/ibrN/config/config.cfg` file and then restarting the Inbound Refinery Managed Server.

Where *N* is 1 for `http://WCCHOST1:16250/ibr/` and *N* is 2 for `http://WCCHOST2:16250/ibr/`

- **Server Socket Port:** Enter an unused port number, such as 5555. This value is the number of the port for calling top-level services.

Take note of the port number because you need it later for configuring Oracle WebCenter Content.

Changing this field value changes the `IntradocServerPort` entry in `/u01/oracle/runtime/wccedg_domain/IBR_Servers/ibrN/config/config.cfg`.

Where *N* is 1 for `http://WCCHOST1:16250/ibr/` and *N* is 2 for `http://WCCHOST2:16250/ibr/`

- **Server Instance Name:** Specify a name for the Inbound Refinery server instance.

You can accept the default value or change it to a name that is more useful to you. Take note of the server name because you will need it later for configuring Oracle WebCenter Content.

You can leave all other fields on the configuration page as they are.

Click **Submit**, and you should get the following message:

```
Post-install configuration complete. Please restart this node.
```

4. Restart the Inbound Refinery Managed Server, using the WebLogic Server Administration Console.
5. Repeat the preceding steps for each Inbound Refinery instance, using different names for the content folders.

14.4.2 Setting Up Content Server to Send Jobs to Inbound Refinery for Conversion

Before Oracle WebCenter Content Server can send jobs to Inbound Refinery for conversion, you need to perform the setup tasks described in the following sections for each Inbound Refinery Managed Server.

Creating an Outgoing Provider

Before Content Server can send files to Inbound Refinery for conversion, you must set up an outgoing provider from Content Server to each Inbound Refinery with the **Handles Inbound Refinery Conversion Jobs** option checked.

Enabling Components for Inbound Refinery on Content Server

Some conversion types require *helper* components to be enabled on Content Server. The `InboundRefinerySupport` component must always be enabled on any Content Server instance that uses Inbound Refinery for document conversion. It is enabled by default on a new Content Server installation.

Selecting File Formats To Be Converted

To tell Content Server which files to send to Inbound Refinery to be converted, you need to select file formats.

14.4.2.1 Creating an Outgoing Provider

Before Content Server can send files to Inbound Refinery for conversion, you must set up an outgoing provider from Content Server to each Inbound Refinery with the **Handles Inbound Refinery Conversion Jobs** option checked.

To create an outgoing provider for each Inbound Refinery instance:

1. Log in to Content Server at the following URL:

```
http://WCCHOST1:16200/cs/
```

2. Open the **Administration** tray or menu, then choose **Providers**.
3. In the **Create a New Provider** table of the Providers page, click **Add** in the **outgoing** row.
4. Enter the following values for the fields:
 - **Provider Name:** Any short name with no spaces. It is a good idea to use the same value as the **Instance Name** value
 - **Provider Description:** Any text string.
 - **Server Host Name:** The name of the host machine where the Inbound Refinery instance is running: `WCCHOST1`.
 - **HTTP Server Address:** The address of the Inbound Refinery instance: `WCCHOST1:16250`.
 - **Server Port:** The value of the **Server Socket Port** field for the Inbound Refinery instance as specified in [Configuring Inbound Refinery Settings](#); for example, 5555. This is the `IntradocServerPort` value in the `InboundRefineryconfig.cfg` file.
 - **Instance Name:** The server instance name for Inbound Refinery as specified in [Configuring Inbound Refinery Settings](#). This is the `IDC_Name` value in the `InboundRefineryconfig.cfg` file.
 - **Relative Web Root:** The web root of the Inbound Refinery instance: `/ibr/`
5. Under Conversion Options, check **Handles Inbound Refinery Conversion Jobs**.

Do not check **Inbound Refinery Read Only Mode**.

6. Click **Add**.
7. Restart the Inbound Refinery Managed Server and Oracle WebCenter Content Server (WebCenter Content Managed Server), using the WebLogic Server Administration Console.
8. Go back to the Providers page, and check that the **Connection State** value is good for the provider.

If the value is not `good`, double-check that you entered all the preceding entries correctly, and check that the Content Server and Inbound Refinery instances can ping each other.

9. Complete steps 1 through 8 for the second IBR server.

For more information about setting up providers, see "Configuring Content Server and Refinery Communication" in *Oracle Fusion Middleware Managing Oracle WebCenter Content*.

14.4.2.2 Enabling Components for Inbound Refinery on Content Server

Some conversion types require *helper* components to be enabled on Content Server. The `InboundRefinerySupport` component must always be enabled on any Content Server instance that uses Inbound Refinery for document conversion. It is enabled by default on a new Content Server installation.

To enable Inbound Refinery components on Content Server:

1. Log in to Content Server at the following URL:
`https://wcc.example.com/cs`
2. From the **Administration** tray or menu, choose **Admin Server**, then **Component Manager**.
3. On the Component Manager page, select **Inbound Refinery**, then select components that you want to enable under Inbound Refinery, such as **XMLConverterSupport**, and then click **Update**.
4. Restart both Content Servers by restarting the WebCenter Content Managed Servers, using the WebLogic Server Administration Console.

14.4.2.3 Selecting File Formats To Be Converted

To tell Content Server which files to send to Inbound Refinery to be converted, you need to select file formats.

To select file formats to be converted:

1. Log in to Content Server at the following URL:
`https://wcc.example.com/cs/`
2. Open the **Administration** tray or menu, then choose **Refinery Administration**, and then **File Formats Wizard** to open the File Formats Wizard page.

This page specifies what file formats will be sent to Inbound Refinery for conversion when they are checked into Content Server.

3. Select the formats you want converted, such as **doc**, **dot**, **docx**, and **dotx** for Microsoft Word documents.
4. Click **Update**.

You can also select file formats with the Configuration Manager, with more fine-grained control, including file formats that the wizard does not list. For more information, see "Managing File Types" in *Oracle Fusion Middleware Managing Oracle WebCenter Content*.

14.5 Validating the Configuration of the Inbound Refinery Managed Servers

To ensure that the Inbound Refinery Managed Servers you have created are properly configured, validate the configuration by logging in to Content Server and verifying that a file with an extension recognized as valid for conversion is correctly converted.

For example, if you selected **docx** as a format to be converted, you can convert a Microsoft Word document with a **.docx** extension to PDF format.

For information about the check-in and check-out procedures, see "Uploading Documents" and "Checking Out and Downloading Files" in *Oracle Fusion Middleware Using Oracle WebCenter Content*.

For information about the conversion process, see "Configuring Content Servers to Send Jobs to Refineries" in *Oracle Fusion Middleware Managing Oracle WebCenter Content*.

Extending the Domain to Include Capture

You need to perform certain tasks in order to extend the enterprise deployment domain with Oracle WebCenter Enterprise Capture software.

[Overview of Extending the Domain to Include Capture](#)

Oracle WebCenter Enterprise Capture provides organizations with a single system to capture both paper and electronic documents.

[Extending the Domain for Capture](#)

The instructions for extending the existing enterprise deployment domain with the Capture software are detailed in this section.

[Propagating the Domain Configuration to WLS_CPT1 and WLS_CPT2](#)

You need to perform the following steps in order to propagate the domain configuration to the Capture Managed Servers.

[Configuring Oracle HTTP Server for the Capture Cluster](#)

To enable Oracle HTTP Server to route to CPT_Cluster, which contains the WLS_CPT1 and WLS_CPT2 Managed Servers, you must set the `WebLogicCluster` parameter to the list of nodes in the cluster.

15.1 Overview of Extending the Domain to Include Capture

Oracle WebCenter Enterprise Capture provides organizations with a single system to capture both paper and electronic documents.

Capture supports both centralized and distributed image capture from a user-friendly web interface capable of using high-volume, production-level scanners. Support for the industry-standard TWAIN scanning interface enables Capture to use a wide variety of industry-leading document imaging scanners to digitize paper content. Existing electronic document files can be easily captured by users or automatically captured through an importing process that can monitor an email server or network folder. Once captured, documents are organized and indexed by applying metadata through manual or automated processes that use bar code recognition technology. After documents are completed, they are committed into a content management system. Capture is fully integrated with Oracle WebCenter Content to provide organizations with one system to capture, store, manage and retrieve their mission critical business content.

15.2 Extending the Domain for Capture

The instructions for extending the existing enterprise deployment domain with the Capture software are detailed in this section.

Extending the domain involves the following tasks.

[Starting the Configuration Wizard](#)

[Navigating the Configuration Wizard Screens to Extend the Domain](#)

15.2.1 Starting the Configuration Wizard

To start the Configuration Wizard:

1. From the WebLogic Server Console, stop any managed servers that will be modified by this domain extension. Managed Servers that are not effected can remain on-line.
2. For any managed servers to be modified, verify the managed server shutdown has completed.
3. Stop the Administration Server once all managed servers are in a steady state.
4. Navigate to the following directory and start the WebLogic Server Configuration Wizard.

```
cd ORACLE_HOME/oracle_common/common/bin
./config.sh
```

15.2.2 Navigating the Configuration Wizard Screens to Extend the Domain

Follow the instructions in the following sections to create and configure the domain for the topology with static and dynamic clusters.

[Extending the Domain with Static Clusters](#)

[Extending the Domain with Dynamic Clusters](#)

15.2.2.1 Extending the Domain with Static Clusters

Follow the instructions in this section to create and configure the domain for the topology with static clusters.

Note:

You can use the same procedure described in this section to extend an existing domain with static clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying the Database Configuration Type"](#)
- [Task 4, "Specifying JDBC Component Schema Information"](#)
- [Task 5, "Providing the GridLink Oracle RAC Database Connection Details"](#)
- [Task 6, "Testing the JDBC Connections"](#)
- [Task 7, "Selecting Advanced Configuration"](#)
- [Task 8, "Configuring Managed Servers"](#)

- [Task 9, "Configuring a Cluster"](#)
- [Task 10, "Assigning Server Templates"](#)
- [Task 11, "Configuring Dynamic Servers"](#)
- [Task 12, "Assigning Managed Servers to the Cluster"](#)
- [Task 13, "Configuring Coherence Clusters"](#)
- [Task 14, "Verifying the Existing Machines"](#)
- [Task 15, "Assigning Servers to Machines"](#)
- [Task 16, "Virtual Targets"](#)
- [Task 17, "Partitions"](#)
- [Task 18, "Configuring the JMS File Store"](#)
- [Task 19, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 20, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 21, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the `ASERVER_HOME` variable, which represents the complete path to the Administration Server domain home you created in [Creating the Initial Infrastructure Domain for an Enterprise Deployment](#) and while extending the domain with WebCenter Content, SOA and Inbound Refinery.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle WebCenter Enterprise Capture - 12.2.1.2.0 [wccapture]**

In addition, the following additional templates should already be selected, because they were used to create the initial domain. These templates are not required to run Capture. They are already selected as part of the enterprise deployment configuration.

- **Oracle Universal Content Mngement - Content Server - 12.2.1.2.0 [wccontent]**

- Oracle SOA Suite - 12.2.1.2.0 [soa]
- Oracle Universal Content Management - Inbound Refinery - 12.2.1.2.0 [wcontent]
- Oracle Enterprise Manager - 12.2.1.2.0 [em]
- Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]
- Oracle JRF - 12.2.1.2.0 [oracle_common]
- WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see "Understanding the Service Table Schema" in *Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see "Datasource Defaults" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, perform the following tasks.

1. Select the **SCAN** check box.
2. In the **Host Name** field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database.

3. In the **SCAN Port** field, enter the SCAN listening port for the database (for example, 1521).
4. In the **ONS Host** field, enter the SCAN address for the Oracle RAC database.
5. In the **ONS Port** field, enter the ONS Remote port (for example, 6200).

Click **Next**.

Task 6 Testing the JDBC Connections

Click **Next** to continue.

Task 7 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
- **File Store**

Task 8 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server appears in the list of servers.

Perform the following tasks to modify the default Managed Server and create a second Managed Server:

1. Rename the default Managed Server to `WLS_CPT1`.
2. Click **Add** to create a new Managed Server and name it `WLS_CPT2`.

Tip:

The server names recommended here will be used throughout this document; if you choose different names, be sure to replace them as needed.

3. Use the information in the following table to fill in the rest of the columns for each Capture Managed Server.

Tip:

More information about the options on the Managed Server screen can be found in Managed Servers in *Creating WebLogic Domains Using the Configuration Wizard*.

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Groups
WLS_CPT1	WCCHOST1	16400	No	Disabled	JRF-MAN-SVR CAPTURE- MGD-SVR
WLS_CPT2	WCCHOST2	16400	No	Disabled	JRF-MAN-SVR CAPTURE- MGD-SVR

Task 9 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Capture software.

You will also set the **Frontend Host** property for the cluster, which ensures that, when necessary, WebLogic Server will redirect Web services callbacks and other redirects to `wcc.example.com` on the load balancer rather than the address in the HOST header of each request.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `CPT_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `Unspecified`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 10 Assigning Server Templates

Click **Next** to proceed to the next screen.

Task 11 Configuring Dynamic Servers

Verify that all dynamic server options are disabled for clusters that are to remain as static clusters.

1. Confirm that the **Dynamic Cluster**, **Calculated Listen Port**, and **Calculated Machine Names** checkboxes on this screen are unchecked.
2. Confirm the **Server Template** selection is **Unspecified**.
3. Click **Next**.

Task 12 Assigning Managed Servers to the Cluster

Use the Assign Servers to Clusters screen to assign `WLS_CPT1` and `WLS_CPT2` to the new cluster, `CPT_Cluster`:

1. In the Clusters pane, select the cluster to which you want to assign the servers; in this case, `CPT_Cluster`.
2. In the Servers pane, assign `WLS_CPT1` to `CPT_Cluster` by doing one of the following:

- Click the WLS_CPT1 Managed Server once to select it, then click on the right arrow to move it beneath the selected cluster in the Clusters pane.
 - Double-click WLS_CPT1 to move it beneath the selected cluster in the clusters pane.
3. Repeat to assign WLS_CPT2 to CPT_Cluster.

Tip:

More information about the options on this screen can be found in Assign Servers to Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 13 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 0, as it was defined during the initial Infrastructure domain creation. Oracle Enterprise Capture does not use Coherence Clusters. This step is a part of the domain extension process.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 14 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed.

Task 15 Assigning Servers to Machines

Use the Assign Servers to Machines screen to assign the Capture Managed Servers you just created to the corresponding machines in the domain.

Assign WLS_CPT1 to WCCHOST1, and assign WLS_CPT2 to WCCHOST2.

Tip:

More information about the options on this screen can be found in Assign Servers to Machines in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 16 Virtual Targets

Click **Next** to proceed to the next screen.

Task 17 Partitions

Click **Next** to proceed to the next screen.

Task 18 Configuring the JMS File Store

In the JMS File Stores screen, assign the following directory for each of the WCC Persistence stores including UMS and BPM file stores:

`ORACLE_RUNTIME/CPT_Cluster/jms`

In this example, replace `ASERVER_HOME` with the value of the variable for your environment. Replace `CPT_Cluster` with the name you assigned to the Capture cluster.

Task 19 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Domain creation will not begin until you click **Update**.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 20 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the Configuration Wizard.

Task 21 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

After you have completed extending the domain with static clusters, go to [Propagating the Domain Configuration to WLS_CPT1 and WLS_CPT2](#).

15.2.2.2 Extending the Domain with Dynamic Clusters

Follow the instructions in this section to create and configure the domain for the topology with dynamic clusters.

Note:

You can use the same procedure described in this section to extend an existing domain with Dynamic Clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks:

- Task 1, "Selecting the Domain Type and Domain Home Location"
- Task 2, "Selecting the Configuration Template"
- Task 3, "Specifying the Database Configuration Type"
- Task 4, "Specifying JDBC Component Schema Information"
- Task 5, "Providing the GridLink Oracle RAC Database Connection Details"
- Task 6, "Testing the JDBC Connections"
- Task 7, "Selecting Advanced Configuration"
- Task 8, "Configuring Managed Servers"
- Task 9, "Configuring a Cluster"
- Task 10, "Assigning Server Templates"
- Task 11, "Configuring Dynamic Servers"
- Task 12, "Assigning Managed Servers to the Cluster"
- Task 13, "Configuring Coherence Clusters"
- Task 14, "Verifying the Existing Machines"
- Task 15, "Assigning Servers to Machines"
- Task 16, "Virtual Targets"
- Task 17, "Partitions"
- Task 18, "Configuring the File Stores"
- Task 19, "Reviewing Your Configuration Specifications and Configuring the Domain"
- Task 20, "Writing Down Your Domain Home and Administration Server URL"
- Task 21, "Start the Administration Server"

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the `ASERVER_HOME` variable, which represents the complete path to the Administration Server domain home you created in [Creating the Initial Infrastructure Domain for an Enterprise Deployment](#) and while extending the domain with WebCenter Content, SOA and Inbound Refinery.

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle WebCenter Enterprise Capture - 12.2.1.2.0 [wccapture]**

In addition, the following additional templates should already be selected, because they were used to create the initial domain. These templates are not required to run Capture. They are already selected as part of the enterprise deployment configuration.

- **Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wccontent]**
- **Oracle SOA Suite - 12.2.1.2.0 [soa]**
- **Oracle Universal Content Management - Inbound Refinery - 12.2.1.2.0 [wccontent]**
- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying the Database Configuration Type

On the Database Configuration Type screen, select **RCU Data**.

All fields are pre-populated, because you already configured the domain to reference the Fusion Middleware schemas that are required for the Infrastructure domain.

Verify and ensure that credentials in all the fields are the same that you have provided while configuring Oracle Fusion Middleware Infrastructure.

Click **Get RCU Configuration** after you finish verifying the database connection information. The following output in the Connection Result Log indicates that the operating succeeded:

```
Connecting to the database server...OK
Retrieving schema data from database server...OK
Binding local schema components with retrieved data...OK
```

Successfully Done.

Tip:

For more information about the **RCU Data** option, see "Understanding the Service Table Schema" in *Creating Schemas with the Repository Creation Utility*.

For more information about the other options on this screen, see "Datasource Defaults" in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 4 Specifying JDBC Component Schema Information

Click **Convert to GridLink** and click **Next**.

Task 5 Providing the GridLink Oracle RAC Database Connection Details

On the GridLink Oracle RAC Component Schema screen, perform the following tasks.

1. Select the **SCAN** check box.
2. In the **Host Name** field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database.
3. In the **SCAN Port** field, enter the SCAN listening port for the database (for example, 1521).
4. In the **ONS Host** field, enter the SCAN address for the Oracle RAC database.
5. In the **ONS Port** field, enter the ONS Remote port (for example, 6200).

Click **Next**.

Task 6 Testing the JDBC Connections

Click **Next** to continue.

Task 7 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

- **Topology**
- **File Store**

Task 8 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server appears in the list of servers.

Perform the following tasks to modify the default Managed Server and create a second Managed Server:

1. Delete the default Managed Server.
2. Click **Next** to proceed to the next screen.

Task 9 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Capture software.

You will also set the **Frontend Host** property for the cluster, which ensures that, when necessary, WebLogic Server will redirect Web services callbacks and other redirects to `wcc.example.com` on the load balancer rather than the address in the **HOST** header of each request.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `CPT_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `ODDC-DYN-CLUSTER`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 10 Assigning Server Templates

Use the Server Templates screen to add a template:

1. Specify `CPT-server-template` in the **Name** field.
2. Specify 16400 in the **Listen Port** field.
3. Leave the **Enable SSL** option unchecked.
4. From the **Cluster** drop-down list, select `CPT_Cluster`.
5. Click **Next** to proceed to the next screen.

Task 11 Configuring Dynamic Servers

Use the Dynamic Clusters screen to configure the required clusters:

1. Specify `CPT_Cluster` in the **Cluster Name** field.
2. Specify `WLS_CPT` in the **Server Name Prefix** field.
3. From the **Server Template** drop-down list, select `UCM-server-template`.
4. Specify 2 in the **Maximum Dynamic Server Count** field.
5. Specify `WCCHOST*` in the **Machine Name Match Expression** field.
6. Select the **Calculated Machine Names**, and **Dynamic Cluster** fields.
7. Click **Next** to proceed to the next screen.

Task 12 Assigning Managed Servers to the Cluster

Click **Next** to proceed to the next screen.

Task 13 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 0, as it was

defined during the initial Infrastructure domain creation. Oracle Enterprise Capture does not use Coherence Clusters. This step is a part of the domain extension process.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 14 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed to the next screen.

Task 15 Assigning Servers to Machines

Click **Next** to proceed to the next screen.

Task 16 Virtual Targets

Click **Next** to proceed to the next screen.

Task 17 Partitions

Click **Next** to proceed to the next screen.

Task 18 Configuring the File Stores

In the JMS File Stores screen, assign the following directory for each of the WCC Persistence stores including UMS and BPM file stores:

```
ORACLE_RUNTIME/CPT_Cluster/jms
```

In this example, replace *ASERVER_HOME* with the value of the variable for your environment. Replace *CPT_Cluster* with the name you assigned to the Capture cluster.

Task 19 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Domain creation will not begin until you click **Update**.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 20 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the Configuration Wizard.

Task 21 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

15.3 Propagating the Domain Configuration to WLS_CPT1 and WLS_CPT2

You need to perform the following steps in order to propagate the domain configuration to the Capture Managed Servers.

To propagate the start scripts and classpath configuration from the Administration Server's domain directory to the Managed Server domain directory:

1. Create a copy of the Managed Server domain directory and the Managed Server applications directory.
2. Run the following pack command on WCCHOST1 to create a template pack:

```
cd ORACLE_COMMON_HOME/common/bin

./pack.sh -managed=true -domain=ASERVER_HOME -
template=edgdomaintemplateExtCPT.jar -template_name=edgdomain_templateCPT
```

3. Run the following unpack command on WCCHOST1 to propagate the template created in the preceding step to the WLS_CPT1 domain directory:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateExtCPT.jar -
app_dir=APPLICATION_HOME -overwrite_domain=true
```

4. Run the following command on WCCHOST1 to copy the template pack created in step 1 to WCCHOST2:

```
scp edgdomaintemplateCPT.jar oracle@WCCHOST2:ORACLE_COMMON_HOME/common/bin
```

5. Run the unpack command on WCCHOST2 to unpack the propagated template to the WLS_CPT2 domain directory.

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateExtCPT.jar -
app_dir=APPLICATION_HOME -overwrite_domain=true
```

6. Restart the Administration Server to make these changes take effect, stopping it with the nmKill command, or with the Administration Console, and then starting it with the nmStart command. Before the restart, stop all Managed Servers in the

domain through the Administration Console, and then start them after the restart. Log in to the Administration Console using the credentials for the `weblogic` user.

15.4 Configuring Oracle HTTP Server for the Capture Cluster

To enable Oracle HTTP Server to route to `CPT_Cluster`, which contains the `WLS_CPT1` and `WLS_CPT2` Managed Servers, you must set the `WebLogicCluster` parameter to the list of nodes in the cluster.

This section includes the following topics.

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

[Setting the Front-End HTTP Host and Port for the Capture Cluster](#)

[Validating Access Through the Load Balancer](#)

15.4.1 Configuring Oracle HTTP Server for the WLS_CPT Managed Servers

To configure Oracle HTTP Server for the `WLS_CPT` Managed Servers:

1. For each of the web servers on `WEBHOST1` and `WEBHOST2`, add the following lines to the `ORACLE_INSTANCE/config/OHS/ohs1/moduleconf/wcc_vh.conf` and `ORACLE_INSTANCE/config/OHS/ohs2/moduleconf/wcc_vh.conf` files:

```
#DC-Console
<Location /dc-console>
  WebLogicCluster WCCHOST1:16400,WCCHOST2:16400
  WLSRequest ON
  WLCookieName JSESSIONID
  WLProxySSL ON
  WLProxySSLPassThrough ON
</Location>

#DC-Client
<Location /dc-client>
  WebLogicCluster WCCHOST1:16400,WCCHOST2VHN316400
  WLSRequest ON
  WLCookieName JSESSIONID
  WLProxySSL ON
  WLProxySSLPassThrough ON
</Location>
```

2. Restart Oracle HTTP Server on both `WEBHOST1` and `WEBHOST2`:

```
./stopComponent.sh ohsn
./startComponent.sh ohsn
```

For `WEBHOST1`, use `ohs1` (where `n=1`) and for `WEBHOST2`, use `ohs2` (where `n=2`).

15.4.2 Setting the Front-End HTTP Host and Port for the Capture Cluster

To set the front-end HTTP host and port for the Capture cluster:

1. Log in to the WebLogic Server Administration Console.

2. Go to the Change Center section and click **Lock & Edit**.
3. Expand the **Environment** node in the **Domain Structure** tree on the left.
4. Click **Clusters**.
5. On the Summary of Clusters page, select **CPT_Cluster**.
6. Open the **HTTP** tab.
7. Set the following values:
 - **Frontend Host:** `wcc.example.com`
 - **Frontend HTTPS Port:** 443
 - **Frontend HTTP Port:** 80
8. Click **Save**.
9. Click **Activate Changes** in the Change Center section of the Administration Console.
10. Restart the servers to make the front-end host directive in the cluster take effect.

15.4.3 Validating Access Through the Load Balancer

Verify URLs to ensure that appropriate routing and failover is working from the HTTP Server to CPT_Cluster. To verify the URLs:

1. While WLS_CPT2 is running, stop WLS_CPT1 from the WebLogic Server Administration Console.
2. Access `https://wcc.example.com/dc-console` to verify that it is functioning properly. (You will not be able to retrieve reports or data because the Capture server is down.)
3. Start WLS_CPT1 from the WebLogic Server Administration Console.
4. Stop WLS_CPT2 from the WebLogic Server Administration Console.
5. Access `https://wcc.example.com/dc-console` to verify that it is functioning properly.
6. Start WLS_CPT2 from the WebLogic Server Administration Console.

Extending the Domain to Include WebCenter Content User Interface

You need to perform certain tasks in order to extend the enterprise deployment domain to include Oracle WebCenter Content User Interface software.

This chapter provides information on modifying system-level setting through MBeans and configuring http server with the WebCenter Content user interface cluster.

Extending the Domain for WebCenter Content User Interface

The instructions for extending the existing enterprise deployment domain with the Oracle WebCenter Content user interface software are detailed in this section.

Propagating the Domain Configuration to WLS_WCCUI1 and WLS_WCCUI2

You need to perform the following steps in order to propagate the domain configuration to the WebCenter Content user interface Managed Servers.

Modifying System-Level Settings Through MBeans

To ensure high availability, modify system-level configuration settings for WebCenter Content user interface through the System Configuration page in Fusion Middleware Control. The settings on this page configure the WebCenter Content user interface MBeans for the domain.

Configuring Oracle HTTP Server with the WebCenter Content User Interface Cluster

Configure Oracle HTTP Server with the WebCenter Content User Interface Cluster, set the front-end HTTP Host and Port for the cluster, and validate access through the load balancer.

Completing the Workflow Configuration

To complete the workflow configuration for the WebCenter Content user interface, you need to restart the Managed Servers and verify the configuration. The `UseDatabaseWfInQueue` configuration variable enables the WebCenter Content user interface to filter workflows assigned to a user. The `EmailNotificationType` configuration variable specifies where the links in notification emails point for workflows and subscriptions in different Content Server user interfaces, and its default value is `NativeWebUI`.

16.1 Extending the Domain for WebCenter Content User Interface

The instructions for extending the existing enterprise deployment domain with the Oracle WebCenter Content user interface software are detailed in this section.

Extending the domain involves the following tasks.

Starting the Configuration Wizard

[Navigating the Configuration Wizard Screens to Extend the Domain](#)

16.1.1 Starting the Configuration Wizard

To start the Configuration Wizard:

1. From the WebLogic Server Console, stop any managed servers that will be modified by this domain extension. Managed Servers that are not effected can remain on-line.
2. For any managed servers to be modified, verify the managed server shutdown has completed.
3. Stop the Administration Server once all managed servers are in a steady state.
4. Navigate to the following directory and start the WebLogic Server Configuration Wizard.

```
cd ORACLE_HOME/oracle_common/common/bin
./config.sh
```

16.1.2 Navigating the Configuration Wizard Screens to Extend the Domain

Follow the instructions in the following sections to create and configure the domain for the topology with static or dynamic clusters.

[Extending the Domain with Static Clusters](#)

[Extending the Domain with Dynamic Clusters](#)

16.1.2.1 Extending the Domain with Static Clusters

Follow the instructions in this section to create and configure the domain for the topology.

Note:

You can use the same procedure described in this section to extend an existing domain. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying JDBC Data Sources Information"](#)
- [Task 4, "Providing the GridLink Oracle RAC Data Sources Details"](#)
- [Task 5, "Testing the JDBC Data Sources"](#)
- [Task 6, "Providing the GridLink Oracle RAC Component Schema Details"](#)
- [Task 7, "Testing the JDBC Component Schema"](#)

- [Task 8, "Specifying Credentials for wccadfConnectUser"](#)
- [Task 9, "Selecting Advanced Configuration"](#)
- [Task 10, "Configuring Managed Servers"](#)
- [Task 11, "Configuring a Cluster"](#)
- [Task 12, "Assigning Server Templates"](#)
- [Task 13, "Configuring Dynamic Servers"](#)
- [Task 14, "Assigning Managed Servers to the Cluster"](#)
- [Task 15, "Configuring Coherence Clusters"](#)
- [Task 16, "Verifying the Existing Machines"](#)
- [Task 17, "Assigning Servers to Machines"](#)
- [Task 18, "Configuring Virtual Targets"](#)
- [Task 19, "Configuring Partitions"](#)
- [Task 20, "Reviewing Configuration Summary"](#)
- [Task 21, "Reviewing Configuration Progress"](#)
- [Task 22, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 23, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 24, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the `ASERVER_HOME` variable, which represents the complete path to the Administration Server domain home you created in [Creating the Initial Infrastructure Domain for an Enterprise Deployment](#).

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle WebCenter Content - Web UI - 12.2.1.2.0 [wcontent]**

In addition, the following additional templates should already be selected, because they were used to create the initial domain:

- **Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wcccontent]**
- **Oracle SOA Suite - 12.2.1.2.0 [soa]**
- **Oracle Universal Content Management - Inbound Refinery - 12.2.1.2.0 [wcccontent]**
- **Oracle WebCenter Enterprise Capture - 12.2.1.2.0 [wccapture]**
- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying JDBC Data Sources Information

Click **Convert to GridLink**, update the required database details, and then click **Next**.

Task 4 Providing the GridLink Oracle RAC Data Sources Details

On the GridLink Oracle RAC Data Sources screen, perform the following tasks.

In the SCAN, Host Name, and Port section:

1. Select the SCAN check box.
2. In the **Host Name** field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database.
3. In the **Port** field, enter the SCAN listening port for the database (for example, 1521).

In the ONS Host and Port section:

1. In the **ONS Host** field, enter the SCAN address for the Oracle RAC database.
2. In the **Port** field, enter the ONS Remote port (typically, 6200).

Click **Next**.

Task 5 Testing the JDBC Data Sources

Click **Next** to continue.

Task 6 Providing the GridLink Oracle RAC Component Schema Details

Click **Next** to continue.

Task 7 Testing the JDBC Component Schema

Click **Next** to continue.

Task 8 Specifying Credentials for wccadfConnectUser

On the Credentials screen, enter the WebLogic user name(not `weblogic_wcc`) and password.

Click **Next** to continue.

Task 9 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

Topology

Task 10 Configuring Managed Servers

On the Managed Servers screen, a new Managed Server appears in the list of servers.

Perform the following tasks to modify the default Managed Server and create a second Managed Server:

1. Rename the default Managed Server to `WLS_WCCUI1`.
2. Click **Add** to create a new Managed Server and name it `WLS_WCCUI2`.

Tip:

The server names recommended here will be used throughout this document; if you choose different names, be sure to replace them as needed.

3. Use the following table to fill in the rest of the columns for each Oracle WebCenter Content user interface Managed Server.

Tip:

More information about the options on the Managed Server screen can be found in Managed Servers in *Creating WebLogic Domains Using the Configuration Wizard*.

Server Name	Listen Address	Listen Port	Enable SSL	SSL Listen Port	Server Groups
WLS_WCCUI1	WCCHOST1	16225	No	Disabled	UCM-ADF-MGD-SVR
WLS_WCCUI2	WCCHOST2	16225	No	Disabled	UCM-ADF-MGD-SVR

Task 11 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle WebCenter Content software.

You will also set the **Frontend Host** property for the cluster, which ensures that, when necessary, WebLogic Server will redirect Web services callbacks and other redirects to `wcc.example.com` on the load balancer rather than the address in the HOST header of each request.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `WCCUI_Cluster` in the **Cluster Name** field.
3. From the **Dynamic Server Groups** drop-down list, select `Unspecified`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 12 Assigning Server Templates

Click **Next** to proceed to the next screen.

Task 13 Configuring Dynamic Servers

Verify that all dynamic server options are disabled for clusters that are to remain as static clusters.

1. Confirm that the **Dynamic Cluster**, **Calculated Listen Port**, and **Calculated Machine Names** checkboxes on this screen are unchecked.
2. Confirm the **Server Template** selection is **Unspecified**.
3. Click **Next**.

Task 14 Assigning Managed Servers to the Cluster

Use the Assign Servers to Clusters screen to assign `WLS_WCCUI1` and `WLS_WCCUI2` to the new cluster, `WCCUI_Cluster`:

1. In the Clusters pane, select the cluster to which you want to assign the servers; in this case, `WCCUI_Cluster`.
2. In the Servers pane, assign `WLS_WCCUI1` to `WCCUI_Cluster` by doing one of the following:
 - Click the `WLS_WCCUI1` Managed Server once to select it, then click on the right arrow to move it beneath the selected cluster in the Clusters pane.
 - Double-click `WLS_WCCUI1` to move it beneath the selected cluster in the clusters pane.
3. Repeat to assign `WLS_WCCUI2` to `WCCUI_Cluster`.

Tip:

More information about the options on this screen can be found in Assign Servers to Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 15 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at 0, as it was defined during the initial Infrastructure domain creation.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 16 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed.

Task 17 Assigning Servers to Machines

Use the Assign Servers to Machines screen to assign the Oracle WebCenter Content user interface Managed Servers you just created to the corresponding machines in the domain.

Assign WLS_WCCUI1 to WCCHOST1, and assign WLS_WCCUI2 to WCCHOST2.

Tip:

More information about the options on this screen can be found in Assign Servers to Machines in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 18 Configuring Virtual Targets

Click **Next** to proceed to the next screen.

Task 19 Configuring Partitions

Click **Next** to proceed to the next screen.

Task 20 Reviewing Configuration Summary

Click **Update** to proceed to the next screen.

Task 21 Reviewing Configuration Progress

After all the processes are complete, click **Next** to proceed to the next screen.

Task 22 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Domain creation will not begin until you click **Update**.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 23 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the configuration wizard.

Task 24 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

After you have completed extending the domain with static clusters, go to [Propagating the Domain Configuration to WLS_WCCUI1 and WLS_WCCUI2](#).

16.1.2.2 Extending the Domain with Dynamic Clusters

Follow the instructions in this section to create and configure the domain for the topology with Dynamic Clusters.

Note:

You can use the same procedure described in this section to extend an existing domain with Dynamic Clusters. If your needs do not match the instructions given in the procedure, be sure to make your selections accordingly, or refer to the supporting documentation for additional details.

Domain creation and configuration includes the following tasks:

- [Task 1, "Selecting the Domain Type and Domain Home Location"](#)
- [Task 2, "Selecting the Configuration Template"](#)
- [Task 3, "Specifying JDBC Data Sources Information"](#)

- [Task 4, "Providing the GridLink Oracle RAC Data Sources Details"](#)
- [Task 5, "Testing the JDBC Data Sources"](#)
- [Task 6, "Providing the GridLink Oracle RAC Component Schema Details"](#)
- [Task 7, "Testing the JDBC Component Schema"](#)
- [Task 8, "Specifying Credentials for wccadfConnectUser"](#)
- [Task 9, "Selecting Advanced Configuration"](#)
- [Task 10, "Configuring Managed Servers"](#)
- [Task 11, "Configuring a Cluster"](#)
- [Task 12, "Assigning Server Templates"](#)
- [Task 13, "Configuring Dynamic Servers"](#)
- [Task 14, "Assigning Managed Servers to the Cluster"](#)
- [Task 15, "Configuring Coherence Clusters"](#)
- [Task 16, "Verifying the Existing Machines"](#)
- [Task 17, "Assigning Servers to Machines"](#)
- [Task 18, "Configuring Virtual Targets"](#)
- [Task 19, "Configuring Partitions"](#)
- [Task 20, "Reviewing Configuration Summary"](#)
- [Task 21, "Reviewing Configuration Progress"](#)
- [Task 22, "Reviewing Your Configuration Specifications and Configuring the Domain"](#)
- [Task 23, "Writing Down Your Domain Home and Administration Server URL"](#)
- [Task 24, "Start the Administration Server"](#)

Task 1 Selecting the Domain Type and Domain Home Location

On the Configuration Type screen, select **Update an existing domain**.

In the **Domain Location** field, select the value of the `ASERVER_HOME` variable, which represents the complete path to the Administration Server domain home you created in [Creating the Initial Infrastructure Domain for an Enterprise Deployment](#).

For more information about the directory location variables, see [File System and Directory Variables Used in This Guide](#).

Tip:

More information about the other options on this screen can be found in Configuration Type in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 2 Selecting the Configuration Template

On the Templates screen, make sure **Update Domain Using Product Templates** is selected, then select the following templates:

- **Oracle WebCenter Content - Web UI - 12.2.1.2.0 [wccontent]**

In addition, the following additional templates should already be selected, because they were used to create the initial domain:

- **Oracle Universal Content Management - Content Server - 12.2.1.2.0 [wccontent]**
- **Oracle SOA Suite - 12.2.1.2.0 [soa]**
- **Oracle Universal Content Management - Inbound Refinery - 12.2.1.2.0 [wccontent]**
- **Oracle WebCenter Enterprise Capture - 12.2.1.2.0 [wccapture]**
- **Oracle Enterprise Manager - 12.2.1.2.0 [em]**
- **Oracle WSM Policy Manager - 12.2.1.2.0 [oracle_common]**
- **Oracle JRF - 12.2.1.2.0 [oracle_common]**
- **WebLogic Coherence Cluster Extension - 12.2.1.2.0 [wlserver]**

Tip:

More information about the options on this screen can be found in Templates in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 3 Specifying JDBC Data Sources Information

Click **Convert to GridLink**, update the required database details, and then click **Next**.

Task 4 Providing the GridLink Oracle RAC Data Sources Details

On the GridLink Oracle RAC Data Sources screen, perform the following tasks.

In the SCAN, Host Name, and Port section:

1. Select the **SCAN** check box.
2. In the **Host Name** field, enter the Single Client Access Name (SCAN) Address for the Oracle RAC database.
3. In the **Port** field, enter the SCAN listening port for the database (for example, 1521).

In the ONS Host and Port section:

1. In the **ONS Host** field, enter the SCAN address for the Oracle RAC database.
2. In the **Port** field, enter the ONS Remote port (typically, 6200).

Click **Next**.

Task 5 Testing the JDBC Data Sources

Click **Next** to continue.

Task 6 Providing the GridLink Oracle RAC Component Schema Details

Click **Next** to continue.

Task 7 Testing the JDBC Component Schema

Click **Next** to continue.

Task 8 Specifying Credentials for wccadfConnectUser

On the Credentials screen, enter the WebLogic user name (not `weblogic_wcc`) and password.

Click **Next** to continue.

Task 9 Selecting Advanced Configuration

To complete domain configuration for the topology, select the following options on the Advanced Configuration screen:

Topology**Task 10 Configuring Managed Servers**

On the Managed Servers screen, a new Managed Server appears in the list of servers.

Perform the following tasks to modify the default Managed Server and create a second Managed Server:

1. Delete the default Managed Server.
2. Click **Next** to proceed to the next screen.

Task 11 Configuring a Cluster

In this task, you create a cluster of Managed Servers to which you can target the Oracle WebCenter Content software.

You will also set the **Frontend Host** property for the cluster, which ensures that, when necessary, WebLogic Server will redirect Web services callbacks and other redirects to `wcc.example.com` on the load balancer rather than the address in the HOST header of each request.

For more information about the `wcc.example.com` virtual server address, see [Configuring Virtual Hosts on the Hardware Load Balancer](#).

Use the Clusters screen to create a new cluster:

1. Click the **Add** button.
2. Specify `WCCUI_Cluster` in the **Cluster Name** field.
3. From the Dynamic Server Groups drop-down list, select `WCCADF-DYN-CLUSTER`.

Note:

By default, server instances in a cluster communicate with one another using unicast. If you want to change your cluster communications to use multicast, refer to "Considerations for Choosing Unicast or Multicast" in *Administering Clusters for Oracle WebLogic Server*.

Tip:

More information about the options on this screen can be found in Clusters in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 12 Assigning Server Templates

Use the Server Templates screen to add a template:

1. Specify `WCCADF-server-template` in the **Name** field.
2. Specify `16225` in the **Listen Port** field.
3. Leave the **Enable SSL** option unchecked.
4. From the **Cluster** drop-down list, select `Unspecified`.
5. Click **Next** to proceed to the next screen.

Task 13 Configuring Dynamic Servers

Use the Dynamic Clusters screen to configure the required clusters:

1. Specify `WCCUI_cluster` in the **Cluster Name** field.
2. Specify `WLS_WCCUI` in the **Server Name Prefix** field.
3. From the **Server Template** drop-down list, select `WCCADF-server-template`.
4. Specify `2` in the **Maximum Dynamic Server Count** field.
5. Specify `WCCHOST*` in the **Machine Name Match Expression** field.
6. Select the **Calculated Machine Names** and **Dynamic Cluster** fields.
7. Click **Next** to proceed to the next screen.

Task 14 Assigning Managed Servers to the Cluster

Click **Next** to proceed to the next screen.

Task 15 Configuring Coherence Clusters

Use the Coherence Clusters screen to configure the Coherence cluster that is automatically added to the domain. Leave the port number value at `0`, as it was defined during the initial Infrastructure domain creation.

Note:

For Coherence licensing information, refer to *Oracle Coherence* in [Oracle Fusion Middleware Licensing Information](#).

Task 16 Verifying the Existing Machines

Under the **Unix Machine** tab, verify the names of the machines you created when creating the initial Infrastructure domain.

Click **Next** to proceed to the next screen.

Task 17 Assigning Servers to Machines

Click **Next** to proceed to the next screen.

Task 18 Configuring Virtual Targets

Click **Next** to proceed to the next screen.

Task 19 Configuring Partitions

Click **Next** to proceed to the next screen.

Task 20 Reviewing Configuration Summary

Click **Update** to proceed to the next screen.

Task 21 Reviewing Configuration Progress

After all the processes are complete, click **Next** to proceed to the next screen.

Task 22 Reviewing Your Configuration Specifications and Configuring the Domain

The Configuration Summary screen contains the detailed configuration information for the domain you are about to create. Review the details of each item on the screen and verify that the information is correct.

You can go back to any previous screen if you need to make any changes, either by using the **Back** button or by selecting the screen in the navigation pane.

Domain creation will not begin until you click **Update**.

Tip:

More information about the options on this screen can be found in Configuration Summary in *Creating WebLogic Domains Using the Configuration Wizard*.

Task 23 Writing Down Your Domain Home and Administration Server URL

The Configuration Success screen will show the following items about the domain you just configured:

- Domain Location
- Administration Server URL

You must make a note of both items as you will need them later; the domain location is needed to access the scripts used to start the Node Manager and Administration Server, and the URL is needed to access the Administration Server.

Click **Finish** to dismiss the configuration wizard.

Task 24 Start the Administration Server

Start the Administration Server to ensure the changes you have made to the domain have been applied.

16.2 Propagating the Domain Configuration to WLS_WCCUI1 and WLS_WCCUI2

You need to perform the following steps in order to propagate the domain configuration to the WebCenter Content user interface Managed Servers.

To propagate the start scripts and classpath configuration from the Administration Server's domain directory to the Managed Server domain directory:

1. Create a copy of the Managed Server domain directory and the Managed Server applications directory.
2. Run the following `pack` command on `WCCHOST1` to create a template pack:

```
cd ORACLE_COMMON_HOME/common/bin

./pack.sh -managed=true -domain=ASERVER_HOME -template=edgdomaintemplateWCCUI.jar -template_name=edgdomain_templateWCCUI
```

3. Run the following `unpack` command on `WCCHOST1` to propagate the template created in the preceding step to the `WLS_WCCUI1` domain directory:

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateWCCUI.jar -app_dir=APPLICATION_HOME -overwrite_domain=true
```

4. Run the following command on `WCCHOST1` to copy the template pack created in step 1 to `WCCHOST2`:

```
scp edgdomaintemplateWCCUI.jar oracle@WCCHOST2:ORACLE_COMMON_HOME/common/bin
```

5. Run the `unpack` command on `WCCHOST2` to unpack the propagated template to the `WLS_WCCUI2` domain directory.

```
cd ORACLE_COMMON_HOME/common/bin

./unpack.sh -domain=MSERVER_HOME -template=edgdomaintemplateWCCUI.jar -app_dir=APPLICATION_HOME -overwrite_domain=true
```

6. Restart the Administration Server to make these changes take effect, stopping it with the `nmKill` command, or with the Administration Console, and then starting it with the `nmStart` command. Before the restart, stop all Managed Servers in the domain through the Administration Console, and then start them after the restart. Log in to the Administration Console using the credentials for the `weblogic` user.

16.3 Modifying System-Level Settings Through MBeans

To ensure high availability, modify system-level configuration settings for WebCenter Content user interface through the System Configuration page in Fusion Middleware Control. The settings on this page configure the WebCenter Content user interface MBeans for the domain.

For information about how to modify system-level settings in Fusion Middleware control, see *Modifying System Configuration Settings in Oracle Fusion Middleware Administering Oracle WebCenter Capture*.

Modify the required parameters:

1. To set the `AdfScopeHaSupport` parameter, complete the following steps:
 - a. From the **WebLogic Domain** menu, select **System MBean Browser**.
 - b. From the left navigation, go to **Application Defined MBeans** > **oracle.adf.share.config** > **Domain:WCC server name** > **Application: Oracle WebCenter Content - Web UI** > **ADFConfig** > **ADFConfig** > **ADFConfig** > **ADFConfiguration**.
 - c. Set the `AdfScopeHaSupport` parameter to `true`.
 - d. Click **Apply**.
2. To set the `ClusterCompatible` and `TemporaryDirectory` parameters, complete the following steps:
 - a. From the **WebLogic Domain** menu, select **System MBean Browser**.
 - b. From the left navigation, go to **Application Defined MBeans** > **oracle.adf.share.config** > **Domain:WCC server name** > **Application: Oracle WebCenter Content - Web UI** > **ADFConfig** > **ADFConfig** > **ADFConfig** > **WccAdfConfiguration**.
 - c. Set the `ClusterCompatible` parameter to `true`.
 - d. Set the `TemporaryDirectory` parameter to `/u01/oracle/config/domains/WCCDomain/WCCUI_Cluster/tempdir`.
 - e. Click **Apply**.
3. To set the `PropConnectionUrl` parameter, complete the following steps:
 - a. From the **WebLogic Domain** menu, select **System MBean Browser**.
 - b. From the left navigation, go to **Application Defined MBeans** > **oracle.adf.share.connections** > **Domain:WCC server name** > **Application: Oracle WebCenter Content - Web UI** > **ADFConnections** > **ADFConnections** > **WccConnection** > **WccAdfServerConnection**.
 - c. Set the `PropConnectionUrl` parameter to `idc://wccinternal.example.com:6300`.
 - d. Click **Apply**.
4. To set the `ApplicationUrl` parameter, complete the following steps:

- a. From the **WebLogic Domain** menu, select **System MBean Browser**.
- b. From the left navigation, go to **Application Defined MBeans > oracle.adf.share.connections > Domain:WCC server name > Application: Oracle WebCenter Content - Web UI > ADFConfig > ADFConfig > ADFConfig > WccAdfConfiguration**.
- c. Set the `ApplicationUrl` parameter to `http://fmwedg.us.oracle.com:1115`.
- d. Click **Apply**.

16.4 Configuring Oracle HTTP Server with the WebCenter Content User Interface Cluster

Configure Oracle HTTP Server with the WebCenter Content User Interface Cluster, set the front-end HTTP Host and Port for the cluster, and validate access through the load balancer.

This section contains the following tasks.

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

[Setting the Front-End HTTP Host and Port for the WebCenter Content User Interface Cluster](#)

[Validating Access Through the Load Balancer](#)

16.4.1 Configuring Oracle HTTP Server for the WLS_WCCUI Managed Servers

To configure Oracle HTTP Server for the WLS_WCCUI Managed Servers:

1. For each of the web servers on WEBHOST1 and WEBHOST2, add the following lines to the `ORACLE_INSTANCE/config/OHS/ohs1/moduleconf/wcc_vh.conf` and `ORACLE_INSTANCE/config/OHS/ohs2/moduleconf/wcc_vh.conf` files:

```
# ADF UI
<Location /wcc>
  WebLogicCluster WCHOST1:16225,WCHOST2:16225
  WLSRequest ON
  WLCookieName WCCSID
  WLProxySSL ON
  WLProxySSLPassThrough ON
</Location>
```

2. Restart both Oracle HTTP Servers.

16.4.2 Setting the Front-End HTTP Host and Port for the WebCenter Content User Interface Cluster

To set the front-end HTTP host and port for the WCC UI cluster:

1. Log in to the WebLogic Server Administration Console.
2. Go to the Change Center section and click **Lock & Edit**.

3. Expand the **Environment** node in the **Domain Structure** tree on the left.
4. Click **Clusters**.
5. On the Summary of Clusters page, select **WCCUI_Cluster**.
6. Open the **HTTP** tab.
7. Set the following values:
 - **Frontend Host:** `wcc.example.com`
 - **Frontend HTTPS Port:** 443
 - **Frontend HTTP Port:** 80
8. Click **Save**.
9. Click **Activate Changes** in the Change Center section of the Administration Console.
10. Restart the servers to make the front-end host directive in the cluster take effect.

16.4.3 Validating Access Through the Load Balancer

Verify URLs to ensure that appropriate routing and failover is working from the HTTP Server to WCCUI_Cluster. To verify the URLs:

1. While WLS_WCCUI2 is running, stop WLS_WCCUI1 from the WebLogic Server Administration Console.
2. Access `http://wcc.example.com/wcc` to verify that it is functioning properly. (You will not be able to retrieve reports or data because the Capture server is down.)
3. Start WLS_WCCUI1 from the WebLogic Server Administration Console.
4. Stop WLS_WCCUI2 from the WebLogic Server Administration Console.
5. Access `http://wcc.example.com/wcc` to verify that it is functioning properly.

You can verify the cluster node to which you were directed after the traffic balancing provided through your load balancer and then again through the web tier.

16.5 Completing the Workflow Configuration

To complete the workflow configuration for the WebCenter Content user interface, you need to restart the Managed Servers and verify the configuration. The `UseDatabaseWfInQueue` configuration variable enables the WebCenter Content user interface to filter workflows assigned to a user. The `EmailNotificationType` configuration variable specifies where the links in notification emails point for workflows and subscriptions in different Content Server user interfaces, and its default value is `NativeWebUI`.

To complete the workflow configuration:

1. Make sure that the `WCCHOST1/ucm/cs/config/config.cfg` file contains the `EmailNotificationType` variable with either of the following settings:

- To generate emails with links that point only to the WebCenter Content user interface, set `EmailNotificationType=ContentUI` in `config.cfg`.
 - To generate emails with links that point to both the WebCenter Content user interface and the native 11g user interface, set `EmailNotificationType=ContentUI,NativeWebUI` in `config.cfg`.
2. Restart the Content Server Managed Server, using the WebLogic Server Administration Console.
 3. Click the alert that appears on the Content Server home page after restart: **Click to complete workflow setup.**

Ensure that Content Server returns a success message: The setup for workflow in queue was successful.

4. Restart the WebCenter Content user interface Managed Server, using the WebLogic Server Administration Console for the WebCenter Content user interface domain.

or more information about workflows, see "Managing Workflows" in *Oracle Fusion Middleware Managing Oracle WebCenter Content*.

Part IV

Common Configuration and Management Procedures for an Enterprise Deployment

There are certain configuration and management procedures that are recommended for a typical enterprise deployment.

The following topics contain configuration and management procedures that are required for a typical enterprise deployment.

[Common Configuration and Management Tasks for an Enterprise Deployment](#)

The configuration and management tasks that may need to be performed on the enterprise deployment environment are detailed in this section.

[Using Whole Server Migration and Service Migration in an Enterprise Deployment](#)

[Configuring Single Sign-On for an Enterprise Deployment](#)

You will need to configure the Oracle HTTP Server WebGate in order to enable single sign-on with Oracle Access Manager.

Common Configuration and Management Tasks for an Enterprise Deployment

The configuration and management tasks that may need to be performed on the enterprise deployment environment are detailed in this section.

[Verifying Manual Failover of the Administration Server](#)

In case a host computer fails, you can fail over the Administration Server to another host. The steps to verify the failover and failback of the Administration Server from WCCHOST1 and WCCHOST2 are detailed in the following sections.

[Enabling SSL Communication Between the Middle Tier and the Hardware Load Balancer](#)

It is important to understand how to enable SSL communication between the middle tier and the hardware load balancer.

[Configuring Roles for Administration of an Enterprise Deployment](#)

In order to manage each product effectively within a single enterprise deployment domain, you must understand which products require specific administration roles or groups, and how to add a product-specific administration role to the Enterprise Deployment Administration group.

[Using JDBC Persistent Stores for TLOGs and JMS in an Enterprise Deployment](#)

The guidelines for when to use JDBC persistent stores for transaction logs (TLOGs) and JMS, and the procedures for configuring the persistent stores in a supported database are explained in this section.

[Performing Backups and Recoveries for an Enterprise Deployment](#)

It is recommended that you follow the below mentioned guidelines for making sure you back up the necessary directories and configuration data for an Oracle WebCenter Content enterprise deployment.

[Modifying the Upload and Stage Directories to an Absolute Path](#)

After configuring the domain and unpacking it to the Managed Server domain directories on all the hosts, verify and update the upload and stage directories for Managed Servers in the new clusters. If implementing dynamic clusters, the configuration of the server template assigned to each newly added cluster should be verified and updated, otherwise, verify and update every statically-defined Managed Server for the newly added clusters.

[Starting and Stopping Servers in Dynamic Clusters](#)

You can start and stop server instances in dynamic clusters by using the same methods you use to start and stop server instances in configured static clusters.

Expanding or Reducing Dynamic Clusters

When you create a dynamic cluster, WebLogic Server generates the number of dynamic servers you specify. Before you decide upon the number of server instances, ensure you have the performance capacity to handle the desired number.

17.1 Verifying Manual Failover of the Administration Server

In case a host computer fails, you can fail over the Administration Server to another host. The steps to verify the failover and failback of the Administration Server from WCCHOST1 and WCCHOST2 are detailed in the following sections.

Assumptions:

- The Administration Server is configured to listen on ADMINVHN, and not on localhost or ANY address.

For more information about the ADMINVHN virtual IP address, see [Reserving the Required IP Addresses for an Enterprise Deployment](#).

- These procedures assume that the Administration Server domain home (ASERVER_HOME) has been mounted on both host computers. This ensures that the Administration Server domain configuration files and the persistent stores are saved on the shared storage device.
- The Administration Server is failed over from WCCHOST1 to WCCHOST2, and the two nodes have these IPs:
 - WCCHOST1: 100.200.140.165
 - WCCHOST2: 100.200.140.205
 - ADMINVHN : 100.200.140.206. This is the Virtual IP where the Administration Server is running, assigned to a virtual sub-interface (e.g. eth0:1), to be available on WCCHOST1 or WCCHOST2.
- Oracle WebLogic Server and Oracle Fusion Middleware components have been installed in WCCHOST2 as described in the specific configuration chapters in this guide.

Specifically, both host computers use the exact same path to reference the binary files in the Oracle home.

The following topics provide details on how to perform a test of the Administration Server failover procedure.

Failing Over the Administration Server to a Different Host

The following procedure shows how to fail over the Administration Server to a different node (WCCHOST2). Note that even after failover, the Administration Server will still use the same Oracle WebLogic Server *machine* (which is a logical machine, not a physical machine).

Validating Access to the Administration Server on WCCHOST2 Through Oracle HTTP Server

After you perform a manual failover of the Administration Server, it is important to verify that you can access the Administration Server, using the standard administration URLs.

Failing the Administration Server Back to WCCHOST1

After you have tested a manual Administration Server failover, and after you have validated that you can access the administration URLs after the failover, you can then migrate the Administration Server back to its original host.

17.1.1 Failing Over the Administration Server to a Different Host

The following procedure shows how to fail over the Administration Server to a different node (WCCHOST2). Note that even after failover, the Administration Server will still use the same Oracle WebLogic Server *machine* (which is a logical machine, not a physical machine).

This procedure assumes you've configured a per domain Node Manager for the enterprise topology. For more information, see [About the Node Manager Configuration in a Typical Enterprise Deployment](#)

To fail over the Administration Server to a different host:

1. Stop the Administration Server.
2. Stop the Node Manager in the Administration Server domain directory (ASERVER_HOME).
3. Migrate the ADMINVHN virtual IP address to the second host:
 - a. Run the following command as root on WCCHOST1 (where X:Y is the current interface used by ADMINVHN):

```
/sbin/ifconfig ethX:Y down
```

- b. Run the following command as root on WCCHOST2:

```
/sbin/ifconfig <interface:index> ADMINVHN netmask <netmask>
```

Note: The index should be different than that of the BI Server 2 on the BIHOST2.

For example:

```
/sbin/ifconfig eth0:1 100.200.140.206 netmask 255.255.255.0
```

Note:

Ensure that the netmask and interface to be used to match the available network configuration in WCCHOST2.

4. Update the routing tables using `arping`, for example:

```
/sbin/arping -q -U -c 3 -I eth0 100.200.140.206
```
5. Start the Node Manager in the Administration Server domain home on WCCHOST2.
6. Start the Administration Server on WCCHOST2.
7. Test that you can access the Administration Server on WCCHOST2 as follows:

- a. Ensure that you can access the Oracle WebLogic Server Administration Console using the following URL:

```
http://ADMINVHN:7001/console
```

- b. Check that you can access and verify the status of components in Fusion Middleware Control using the following URL:

```
http://ADMINVHN:7001/em
```

17.1.2 Validating Access to the Administration Server on WCCHOST2 Through Oracle HTTP Server

After you perform a manual failover of the Administration Server, it is important to verify that you can access the Administration Server, using the standard administration URLs.

From the load balancer, access the following URLs to ensure that you can access the Administration Server when it is running on WCCHOST2:

- `http://admin.example.com/console`
This URL should display the WebLogic Server Administration console.
- `http://admin.example.com/em`
This URL should display Oracle Enterprise Manager Fusion Middleware Control.

17.1.3 Failing the Administration Server Back to WCCHOST1

After you have tested a manual Administration Server failover, and after you have validated that you can access the administration URLs after the failover, you can then migrate the Administration Server back to its original host.

1. Stop the Administration Server.
2. Stop the Node Manager in the Administration Server domain home on WCCHOST2.
3. Run the following command as root on WCCHOST2.

```
/sbin/ifconfig ethZ:N down
```

4. Run the following command as root on WCCHOST1:

```
/sbin/ifconfig ethX:Y 100.200.140.206 netmask 255.255.255.0
```

Note:

Ensure that the netmask and interface to be used match the available network configuration in WCCHOST1.

5. Update the routing tables using `arping` on WCCHOST1:

```
/sbin/arping -q -U -c 3 -I ethX 100.200.140.206
```

6. Start the Node Manager in the Administration Server domain home on WCCHOST1.

7. Start the Administration Server on WCCHOST1.
8. Test that you can access the Oracle WebLogic Server Administration Console using the following URL:

`http://ADMINVHN:7001/console`

9. Check that you can access and verify the status of components in the Oracle Enterprise Manager using the following URL:

`http://ADMINVHN:7001/em`

17.2 Enabling SSL Communication Between the Middle Tier and the Hardware Load Balancer

It is important to understand how to enable SSL communication between the middle tier and the hardware load balancer.

Note:

The following steps are applicable if the hardware load balancer is configured with SSL and the front end address of the system has been secured accordingly.

[When is SSL Communication Between the Middle Tier and Load Balancer Necessary?](#)

[Generating Self-Signed Certificates Using the `utils.CertGen` Utility](#)

[Creating an Identity Keystore Using the `utils.ImportPrivateKey` Utility](#)

[Creating a Trust Keystore Using the `Keytool` Utility](#)

[Importing the Load Balancer Certificate into the Trust Store](#)

[Adding the Updated Trust Store to the Oracle WebLogic Server Start Scripts](#)

[Configuring Node Manager to Use the Custom Keystores](#)

[Configuring WebLogic Servers to Use the Custom Keystores](#)

[Testing Composites Using SSL Endpoints](#)

17.2.1 When is SSL Communication Between the Middle Tier and Load Balancer Necessary?

In an enterprise deployment, there are scenarios where the software running on the middle tier must access the front-end SSL address of the hardware load balancer. In these scenarios, an appropriate SSL handshake must take place between the load balancer and the invoking servers. This handshake is not possible unless the Administration Server and Managed Servers on the middle tier are started using the appropriate SSL configuration.

17.2.2 Generating Self-Signed Certificates Using the `utils.CertGen` Utility

This section describes the procedure for creating self-signed certificates on WCCHOST1. Create these certificates using the network name or alias of the host.

The directory where keystores and trust keystores are maintained must be on shared storage that is accessible from all nodes so that when the servers fail over (manually or with server migration), the appropriate certificates can be accessed from the failover node. Oracle recommends using central or shared stores for the certificates used for different purposes (for example, SSL set up for HTTP invocations). For more information, see the information on filesystem specifications for the `KEYSTORE_HOME` location provided in [Understanding the Recommended Directory Structure for an Enterprise Deployment](#).

For information on using trust CA certificates instead, see the information about configuring identity and trust in *Oracle Fusion Middleware Administering Security for Oracle WebLogic Server*.

About Passwords

The passwords used in this guide are used only as examples. Use secure passwords in a production environment. For example, use passwords that include both uppercase and lowercase characters as well as numbers.

To create self-signed certificates:

1. Temporarily, set up your environment by running the following command:

```
WL_HOME/server/bin/setWLSEnv.sh script:
```

```
. WL_HOME/server/bin/setWLSEnv.sh
```

Note that there is a dot(.) and space() preceding the script name in order to source the shell script in the current shell.

2. Verify that the `CLASSPATH` environment variable is set:

```
echo $CLASSPATH
```

3. Verify that the shared configuration directory folder has been created and mounted to shared storage correctly as described in [Preparing the File System for an Enterprise Deployment](#).

For example, use the following command to verify that the shared configuration directory is available to each host:

```
df -h | grep -B1 SHARED_CONFIG_DIR
```

Replace `SHARED_CONFIG_DIR` with the actual path to your shared configuration directory.

You can also do a listing of the directory to ensure it is available to the host:

```
ls -al SHARED_CONFIG_DIR
```

4. Create the keystore home folder structure if does not already exist.

For example:

```
cd SHARED_CONFIG_DIR
mkdir keystores
chown oracle:oinstall keystores
chmod 750 keystores
export KEYSTORE_HOME=SHARED_CONFIG_DIR/keystores
```

5. Change directory to the keystore home:

```
cd KEYSTORE_HOME
```

6. Run the `utils.CertGen` tool to create the certificates for both the physical host names and the virtual host names used by servers on each host.

Note:

You must run the `utils.CertGen` tool to create certificates for all the other hosts that run the Manager Servers.

Syntax:

```
java utils.CertGen key_passphrase cert_file_name key_file_name [export | domestic] [hostname]
```

Examples:

```
java utils.CertGen password ADMINVHN.example.com_cert \  
ADMINVHN.example.com_key domestic ADMINVHN.example.com
```

```
java utils.CertGen password WCCHOST1.example.com_cert \  
WCCHOST1.example.com_key domestic WCCHOST1.example.com
```

7. Repeat the above step for all the remaining hosts used in the system (for example, WCCHOST2).

17.2.3 Creating an Identity Keystore Using the `utils.ImportPrivateKey` Utility

This section describes how to create an Identity Keystore on WCCHOST1.example.com.

In previous sections you have created certificates and keys that reside on shared storage. In this section, the certificate and private keys created earlier for all hosts and ADMINVHN are imported into a new Identity Store. Make sure that you use a different alias for each of the certificate/key pair imported.

Note:

The Identity Store is created (if none exists) when you import a certificate and the corresponding key into the Identity Store using the `utils.ImportPrivateKey` utility.

1. Import the certificate and private key for ADMINVHN and WCCHOST1 into the Identity Store. Make sure that you use a different alias for each of the certificate/key pair imported.

Syntax:

```
java utils.ImportPrivateKey  
-certfile cert_file  
-keyfile private_key_file  
[-keyfilepass private_key_password]  
-keystore keystore  
-storepass storepass  
[-storetype storetype]  
-alias alias  
[-keypass keypass]
```

Note:

Default keystore_type is jks.

Examples:

```
java utils.ImportPrivateKey\  
-certfile KEYSTORE_HOME/ADMINVHN.example.com_cert.pem\  
-keyfile KEYSTORE_HOME/ADMINVHN.example.com_key.pem\  
-keyfilepass password\  
-keystore appIdentityKeyStore.jks\  
-storepass password\  
-alias ADMINVHN\  
-keypass password
```

```
java utils.ImportPrivateKey\  
-certfile KEYSTORE_HOME/WCCHOST1.example.com_cert.pem\  
-keyfile KEYSTORE_HOME/WCCHOST1.example.com_key.pem\  
-keyfilepass password\  
-keystore appIdentityKeyStore.jks\  
-storepass password\  
-alias WCCHOST1\  
-keypass password
```

2. Repeat the java importPrivateKey command for each of the remaining host-specific certificate and key pairs. (for example, for WCCHOST2, WCCHOST1, WCCHOST2).

Note: Make sure to use a unique alias for each certificate/key pair imported.

17.2.4 Creating a Trust Keystore Using the Keytool Utility

To create the Trust Keystore on WCCHOST1.example.com.

1. Copy the standard java keystore to create the new trust keystore since it already contains most of the root CA certificates needed.

Oracle does not recommend modifying the standard Java trust key store directly. Copy the standard Java keystore CA certificates located under the WL_HOME/server/lib directory to the same directory as the certificates. For example:

```
cp WL_HOME/server/lib/cacerts KEYSTORE_HOME/appTrustKeyStore.jks
```

2. Use the keytool utility to change the default password.

The default password for the standard Java keystore is `changeit`. Oracle recommends always changing the default password, as follows:

```
keytool -storepasswd -new NewPassword -keystore TrustKeyStore -storepass  
Original_Password
```

For example:

```
keytool -storepasswd -new password -keystore appTrustKeyStore.jks -storepass  
changeit
```

3. Import the CA certificate into the appTrustKeyStore using the keytool utility.

The CA certificate `CertGenCA.der` is used to sign all certificates generated by the `utils.CertGen` tool and is located at `WL_HOME/server/lib` directory.

Use the following syntax to import the certificate:

```
keytool -import -v -noprompt -trustcacerts -alias AliasName -file CAFileLocation -
keystore KeyStoreLocation -storepass KeyStore_Password
```

For example:

```
keytool -import -v -noprompt -trustcacerts -alias clientCACert -file WL_HOME/
server/lib/CertGenCA.der -keystore appTrustKeyStore.jks -storepass password
```

17.2.5 Importing the Load Balancer Certificate into the Trust Store

For the SSL handshake to behave properly, the load balancer's certificate needs to be added to the WLS servers trust store. For adding it, follow these steps:

1. Access the site on SSL with a browser (this add the server's certificate to the browser's repository).
2. From the browser's certificate management tool, export the certificate to a file that is on the server's file system (with a file name such as `wcp.example.com.crt`).
3. Use the `keytool` to import the load balancer's certificate into the truststore:

For example:

```
keytool -import -file /oracle/certificates/soal.cz.oracle.com -v -keystore
appTrustKeyStore.jks -alias aliasSOA
keytool -import -file /oracle/certificates/soal-osb.cz.oracle.com.crt -v -
keystore appTrustKeyStore.jks -alias aliasOSB
```

17.2.6 Adding the Updated Trust Store to the Oracle WebLogic Server Start Scripts

The `setDomainEnv.sh` script is provided by Oracle WebLogic Server and is used to start the Administration Server and the Managed Servers in the domain. To ensure that each server accesses the updated trust store, edit the `setDomainEnv.sh` script in each of the domain home directories in the enterprise deployment.

1. Log in to `WCCHOST1` and open the following file with a text editor:

```
ASERVER_HOME/bin/setDomainEnv.sh
```

2. Replace reference to the existing `DemoTrustStore` entry with the following entry:

Note:

All the values for `EXTRA_JAVA_PROPERTIES` must be on one line in the file, followed by the `export` command on a new line.

```
EXTRA_JAVA_PROPERTIES="$${EXTRA_JAVA_PROPERTIES} -Dsoa.archives.dir=${
{SOA_ORACLE_HOME}/soa -Djavax.net.ssl.trustStore=/u01/oracle/certs/
appTrustKeyStore.jks"
export EXTRA_JAVA_PROPERTIES
```

3. Make the same change to the `setDomainEnv.sh` file in the `MSERVER_HOME/bin` directory `WCCHOST1`, `WCCHOST2`, `WEBHOST1`, and `WEBHOST2`.

Note:

The `setDomainEnv.sh` file cannot be copied between `ASERVER_HOME/bin` and `MSERVER_HOME/bin` as there are differences in the files for these two domain home locations. `MSERVER_HOME/bin/setDomainEnv.sh` can be copied between hosts.

WebLogic Server will automatically overwrite the `setDomainEnv.sh` file after each domain extension. Some patches may also replace this file. Verify your customizations to `setDomainEnv.sh` after each of these types of maintenance operations.

17.2.7 Configuring Node Manager to Use the Custom Keystores

To configure the Node Manager to use the custom keystores, add the following lines to the end of the `nodemanager.properties` files located both in `ASERVER_HOME/nodemanager` and `MSERVER_HOME/nodemanager` directories in all nodes:

```
KeyStores=CustomIdentityAndCustomTrust
CustomIdentityKeyStoreFileName=Identity KeyStore
CustomIdentityKeyStorePassPhrase=Identity KeyStore Passwd
CustomIdentityAlias=Identity Key Store Alias
CustomIdentityPrivateKeyPassPhrase=Private Key used when creating Certificate
```

Make sure to use the correct value for `CustomIdentityAlias` for Node Manager's listen address. For example, in the `WCCHOST1 MSERVER_HOME`, use the alias `WCCHOST1` and in the `ASERVER_HOME` on `WCCHOST1`, use the alias `ADMINVHN` according to the steps in [Creating an Identity Keystore Using the `utils.ImportPrivateKey` Utility](#).

```
Example for WCCHOST1:
KeyStores=CustomIdentityAndCustomTrust
CustomIdentityKeyStoreFileName=KEYSTORE_HOME/appIdentityKeyStore.jks
CustomIdentityKeyStorePassPhrase=password
CustomIdentityAlias=WCCHOST1
CustomIdentityPrivateKeyPassPhrase=password
```

The passphrase entries in the `nodemanager.properties` file are encrypted when you start Node Manager as described in *Starting the Node Manager on WCCHOST1*. For security reasons, minimize the time the entries in the `nodemanager.properties` file are left unencrypted. After you edit the file, restart Node Manager as soon as possible so that the entries are encrypted.

Note: The `CustomIdentityAlias` value will need to be corrected every time the domain is extended after this configuration is performed. An unpack operation will replace the `CustomIdentityAlias` with the Administration Server's value when the domain configuration is written.

17.2.8 Configuring WebLogic Servers to Use the Custom Keystores

Configure the WebLogic Servers to use the custom keystores using the Oracle WebLogic Server Administration Console. Complete this procedure for the Administration Server and the Managed Servers that require access to the front end LBR on SSL.

To configure the identity and trust keystores:

1. Log in to the Administration Console, and click **Lock & Edit**.
2. In the left pane, expand **Environment**, and select **Servers**.
3. Click the name of the server for which you want to configure the identity and trust keystores.
4. Select **Configuration**, and then **Keystores**.
5. In the **Keystores** field, click **Change**, and select **Custom Identity and Custom Trust** method for storing and managing private keys/digital certificate pairs and trusted CA certificates, and click Save.
6. In the Identity section, define attributes for the identity keystore.
 - Custom Identity Keystore: Enter the fully qualified path to the identity keystore:
`KEYSTORE_HOME/appIdentityKeyStore.jks`
 - Custom Identity Keystore Type: Leave this field blank, it defaults to JKS.
 - Custom Identity Keystore Passphrase: Enter the password `Keystore_Password` you provided in [Creating an Identity Keystore Using the `utils.ImportPrivateKey Utility`](#)

This attribute may be optional or required depending on the type of keystore. All keystores require the passphrase in order to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. WebLogic Server reads only from the keystore, so whether or not you define this property depends on the requirements of the keystore.
7. In the Trust section, define properties for the trust keystore:
 - Custom Trust Keystore: Enter the fully qualified path to the trust keystore:
`KEYSTORE_HOME/appTrustKeyStore.jks`
 - Custom Trust Keystore Type: Leave this field blank, it defaults to JKS.
 - Custom Trust Keystore Passphrase: The password you provided in as `New_Password` in "Creating a Trust Keystore Using the Keytool Utility."

As mentioned in the previous step, this attribute may be optional or required depending on the type of keystore.
8. Click **Save**.
9. To activate these changes, in the Change Center of the Administration Console, click **Activate Changes**.
10. Click **Lock & Edit**.
11. Select **Configuration**, then **SSL**.

12. In the Private Key Alias field, enter the alias you used for the host name the managed server listens on.

In the Private Key Passphrase and the Confirm Private Key Passphrase fields, enter the password for the keystore that you created in [Creating an Identity Keystore Using the `utils.ImportPrivateKey` Utility](#)

13. Click **Save**.
14. Click **Activate Changes** in the Administration Console's Change Center to make the changes take effect.
15. Restart the Administration Server.
16. Restart the Managed Servers where the keystore has been updated.

Note:

The fact that servers can be restarted using the Administration Console/Node Manager is a good verification that the communication between Node Manager, Administration Server, and the managed servers is correct.

17.2.9 Testing Composites Using SSL Endpoints

Once SSL has been enabled, composites endpoints can be verified on SSL from Oracle Enterprise Manager FMW Control. To test a SSL endpoint follow this steps:

1. Enter the following URL into a browser to display the Fusion Middleware Control login screen:

`http://ADMINVHN:7001/em`

In this example:

- Replace ADMINVHN with the host name assigned to the ADMINVHN Virtual IP address in [Identifying and Obtaining Software Distributions for an Enterprise Deployment](#).
 - Port 7001 is the typical port used for the Administration Server console and Fusion Middleware Control. However, you should use the actual URL that was displayed at the end of the Configuration Wizard session when you created the domain.
2. Log in to Fusion Middleware Control using the Administration Server credentials.
 3. From the tree on the left, expand SOA. Click **soa-infra(WLS_SOAn)** and select the partition that the composite was deployed to.
 4. Select the composite.
 5. From the right pane, click on the Test tab.

6. In the WSDL or WADL address, replace `http://wcc.example.com:80` with `https://wcc.example.com:443`.
7. Click **Parse WSDL or WADL**.
8. Verify that the Endpoint URL shown is SSL.
9. Test the composite. If the response is as expected for the web service, the SSL communication between the Administration Server and the Load Balancer has been configured properly.

17.3 Configuring Roles for Administration of an Enterprise Deployment

In order to manage each product effectively within a single enterprise deployment domain, you must understand which products require specific administration roles or groups, and how to add a product-specific administration role to the Enterprise Deployment Administration group.

Each enterprise deployment consists of multiple products. Some of the products have specific administration users, roles, or groups that are used to control administration access to each product.

However, for an enterprise deployment, which consists of multiple products, you can use a single LDAP-based authorization provider and a single administration user and group to control access to all aspects of the deployment. For more information about creating the authorization provider and provisioning the enterprise deployment administration user and group, see [Creating a New LDAP Authenticator and Provisioning a New Enterprise Deployment Administrator User and Group](#).

To be sure that you can manage each product effectively within the single enterprise deployment domain, you must understand which products require specific administration roles or groups, you must know how to add any specific product administration roles to the single, common enterprise deployment administration group, and if necessary, you must know how to add the enterprise deployment administration user to any required product-specific administration groups.

For more information, see the following topics.

[Summary of Products with Specific Administration Roles](#)

[Adding a Product-Specific Administration Role to the Enterprise Deployment Administration Group](#)

17.3.1 Summary of Products with Specific Administration Roles

The following table lists the Fusion Middleware products that have specific administration roles, which must be added to the enterprise deployment administration group (`WCCAdministrators`), which you defined in the LDAP Authorization Provider for the enterprise deployment.




Use the information in the following table and the instructions in [Adding a Product-Specific Administration Role to the Enterprise Deployment Administration Group](#) to add the required administration roles to the enterprise deployment Administration group.

Product	Application Stripe	Administration Role to be Assigned
Oracle Web Services Manager	wsm-pm	policy.updater
SOA Infrastructure	soa-infra	SOAdmin

17.3.2 Adding a Product-Specific Administration Role to the Enterprise Deployment Administration Group

For products that require a product-specific administration role, use the following procedure to add the role to the enterprise deployment administration group:

1. Use the Oracle WebLogic Server Administration Server credentials to log in to Oracle Enterprise Manager Fusion Middleware Control.

These are the credentials you created when you initially configured the domain and created the Oracle WebLogic Server Administration user name (typically, `weblogic_wcc`) and password.
2. From the **WebLogic Domain** menu, select **Security**, and then **Application Roles**.
3. For each production-specific application role, select the corresponding application stripe from the **Application Stripe** drop-down menu.
4. Click Search Application Roles icon  to display all the application roles available in the domain.
5. Select the row for the application role you are adding to the enterprise deployment administration group.
6. Click the Edit icon  to edit the role.
7. Click the Add icon  on the Edit Application Role page.
8. In the Add Principal dialog box, select **Group** from the **Type** drop-down menu.
9. Search for the enterprise deployment administrators group, by entering the group name (for example, `WCCAdministrators`) in the **Principal Name Starts With** field and clicking the right arrow to start the search.
10. Select the administrator group in the search results and click **OK**.
11. Click **OK** on the Edit Application Role page.

17.4 Using JDBC Persistent Stores for TLOGs and JMS in an Enterprise Deployment

The guidelines for when to use JDBC persistent stores for transaction logs (TLOGs) and JMS, and the procedures for configuring the persistent stores in a supported database are explained in this section.

[About JDBC Persistent Stores for JMS and TLOGs](#)

Oracle Fusion Middleware supports both database-based and file-based persistent stores for Oracle WebLogic Server transaction logs (TLOGs) and JMS. Before deciding on a persistent store strategy for your environment, consider the advantages and disadvantages of each approach.

[Products and Components that use JMS Persistence Stores and TLOGs](#)

[Performance Impact of the TLOGs and JMS Persistent Stores](#)

One of the primary considerations when selecting a storage method for Transaction Logs and JMS persistent stores is the potential impact on performance. This topic provides some guidelines and details to help you determine the performance impact of using JDBC persistent stores for TLOGs and JMS.

[Roadmap for Configuring a JDBC Persistent Store for TLOGs](#)

The following topics describe how to configure a database-based persistent store for transaction logs.

[Roadmap for Configuring a JDBC Persistent Store for JMS](#)

The following topics describe how to configure a database-based persistent store for JMS.

[Creating a User and Tablespace for TLOGs](#)

Before you can create a database-based persistent store for transaction logs, you must create a user and tablespace in a supported database.

[Creating a User and Tablespace for JMS](#)

Before you can create a database-based persistent store for JMS, you must create a user and tablespace in a supported database.

[Creating GridLink Data Sources for TLOGs and JMS Stores](#)

Before you can configure database-based persistent stores for JMS and TLOGs, you must create two data sources: one for the TLOGs persistent store and one for the JMS persistent store.

[Assigning the TLOGs JDBC store to the Managed Servers](#)

After you create the tablespace and user in the database, and you have created the datasource, you can then assign the TLOGs persistence store to each of the required Managed Servers.

[Creating a JDBC JMS Store](#)

After you create the JMS persistent store user and table space in the database, and after you create the data source for the JMS persistent store, you can then use the Administration Console to create the store.

[Assigning the JMS JDBC store to the JMS Servers](#)

After you create the JMS tablespace and user in the database, create the JMS datasource, and create the JDBC store, then you can then assign the JMS persistence store to each of the required JMS Servers.

[Creating the Required Tables for the JMS JDBC Store](#)

The final step in using a JDBC persistent store for JMS is to create the required JDBC store tables. Perform this task before restarting the Managed Servers in the domain.

17.4.1 About JDBC Persistent Stores for JMS and TLOGs

Oracle Fusion Middleware supports both database-based and file-based persistent stores for Oracle WebLogic Server transaction logs (TLOGs) and JMS. Before deciding on a persistent store strategy for your environment, consider the advantages and disadvantages of each approach.

Note:

Regardless of which storage method you choose, Oracle recommends that for transaction integrity and consistency, you use the same type of store for both JMS and TLOGs.

When you store your TLOGs and JMS data in an Oracle database, you can take advantage of the replication and high availability features of the database. For example, you can use OracleData Guard to simplify cross-site synchronization. This is especially important if you are deploying Oracle Fusion Middleware in a disaster recovery configuration.

Storing TLOGs and JMS data in a database also means you don't have to identify a specific shared storage location for this data. Note, however, that shared storage is still required for other aspects of an enterprise deployment. For example, it is necessary for Administration Server configuration (to support Administration Server failover), for deployment plans, and for adapter artifacts, such as the File/FTP Adapter control and processed files.

If you are storing TLOGs and JMS stores on a shared storage device, then you can protect this data by using the appropriate replication and backup strategy to guarantee zero data loss, and you will potentially realize better system performance. However, the file system protection will always be inferior to the protection provided by an Oracle Database.

For more information about the potential performance impact of using a database-based TLOGs and JMS store, see [Performance Impact of the TLOGs and JMS Persistent Stores](#).

17.4.2 Products and Components that use JMS Persistence Stores and TLOGs

Determining which installed FMW products and components utilize persistent stores can be done through the WebLogic Server Console in the Domain Structure navigation under *DomainName* > **Services** > **Persistent Stores**. The list will indicate the name of the store, the store type (usually **FileStore**), the targeted managed server, and whether the target can be migrated to or not.

The persistent stores with migratable targets are the appropriate candidates for consideration of the use of JDBC Persistent Stores. The stores listed that pertain to MDS are outside the scope of this chapter and should not be considered.

17.4.3 Performance Impact of the TLOGs and JMS Persistent Stores

One of the primary considerations when selecting a storage method for Transaction Logs and JMS persistent stores is the potential impact on performance. This topic provides some guidelines and details to help you determine the performance impact of using JDBC persistent stores for TLOGs and JMS.

Performance Impact of Transaction Logs Versus JMS Stores

For transaction logs, the impact of using a JDBC store is relatively small, because the logs are very transient in nature. Typically, the effect is minimal when compared to other database operations in the system.

On the other hand, JMS database stores can have a higher impact on performance if the application is JMS intensive.

Factors that Affect Performance

There are multiple factors that can affect the performance of a system when it is using JMS DB stores for custom destinations. The main ones are:

- Custom destinations involved and their type
- Payloads being persisted
- Concurrency on the SOA system (producers on consumers for the destinations)

Depending on the effect of each one of the above, different settings can be configured in the following areas to improve performance:

- Type of data types used for the JMS table (using raw vs. lobs)
- Segment definition for the JMS table (partitions at index and table level)

Impact of JMS Topics

If your system uses Topics intensively, then as concurrency increases, the performance degradation with an Oracle RAC database will increase more than for Queues. In tests conducted by Oracle with JMS, the average performance degradation for different payload sizes and different concurrency was less than 30% for Queues. For topics, the impact was more than 40%. Consider the importance of these destinations from the recovery perspective when deciding whether to use database stores.

Impact of Data Type and Payload Size

When choosing to use the RAW or SecureFiles LOB data type for the payloads, consider the size of the payload being persisted. For example, when payload sizes range between 100b and 20k, then the amount of database time required by SecureFiles LOB is slightly higher than for the RAW data type.

More specifically, when the payload size reach around 4k, then SecureFiles tend to require more database time. This is because 4k is where writes move out-of-row. At around 20k payload size, SecureFiles data starts being more efficient. When payload sizes increase to more than 20k, then the database time becomes worse for payloads set to the RAW data type.

One additional advantage for SecureFiles is that the database time incurred stabilizes with payload increases starting at 500k. In other words, at that point it is not relevant

(for SecureFiles) whether the data is storing 500k, 1MB or 2MB payloads, because the write is asynchronous, and the contention is the same in all cases.

The effect of concurrency (producers and consumers) on the queue's throughput is similar for both RAW and SecureFiles until the payload sizes reach 50K. For small payloads, the effect on varying concurrency is practically the same, with slightly better scalability for RAW. Scalability is better for SecureFiles when the payloads are above 50k.

Impact of Concurrency, Worker Threads, and Database Partitioning

Concurrency and worker threads defined for the persistent store can cause contention in the RAC database at the index and global cache level. Using a reverse index when enabling multiple worker threads in one single server or using multiple Oracle WebLogic Server clusters can improve things. However, if the Oracle Database partitioning option is available, then global hash partition for indexes should be used instead. This reduces the contention on the index and the global cache buffer waits, which in turn improves the response time of the application. Partitioning works well in all cases, some of which will not see significant improvements with a reverse index.

17.4.4 Roadmap for Configuring a JDBC Persistent Store for TLOGs

The following topics describe how to configure a database-based persistent store for transaction logs.

1. [Creating a User and Tablespace for TLOGs](#)
2. [Creating GridLink Data Sources for TLOGs and JMS Stores](#)
3. [Assigning the TLOGs JDBC store to the Managed Servers](#)

17.4.5 Roadmap for Configuring a JDBC Persistent Store for JMS

The following topics describe how to configure a database-based persistent store for JMS.

1. [Creating a User and Tablespace for JMS](#)
2. [Creating GridLink Data Sources for TLOGs and JMS Stores](#)
3. [Creating a JDBC JMS Store](#)
4. [Assigning the JMS JDBC store to the JMS Servers](#)
5. [Creating the Required Tables for the JMS JDBC Store](#)

17.4.6 Creating a User and Tablespace for TLOGs

Before you can create a database-based persistent store for transaction logs, you must create a user and tablespace in a supported database.

1. Create a tablespace called `tlogs`.

For example, log in to SQL*Plus as the `sysdba` user and run the following command:

```
SQL> create tablespace tlogs
      logging datafile 'path-to-data-file-or-+asmvolume'
      size 32m autoextend on next 32m maxsize 2048m extent management local;
```

2. Create a user named TLOGS and assign to it the `tlogs` tablespace.

For example:

```
SQL> create user TLOGS identified by password;

SQL> grant create table to TLOGS;

SQL> grant create session to TLOGS;

SQL> alter user TLOGS default tablespace tlogs;

SQL> alter user TLOGS quota unlimited on tlogs;
```

17.4.7 Creating a User and Tablespace for JMS

Before you can create a database-based persistent store for JMS, you must create a user and tablespace in a supported database.

1. Create a tablespace called `jms`.

For example, log in to SQL*Plus as the `sysdba` user and run the following command:

```
SQL> create tablespace jms
      logging datafile 'path-to-data-file-or-+asmvolume'
      size 32m autoextend on next 32m maxsize 2048m extent management local;
```

2. Create a user named JMS and assign to it the `jms` tablespace.

For example:

```
SQL> create user JMS identified by password;

SQL> grant create table to JMS;

SQL> grant create session to JMS;

SQL> alter user JMS default tablespace jms;

SQL> alter user JMS quota unlimited on jms;
```

17.4.8 Creating GridLink Data Sources for TLOGs and JMS Stores

Before you can configure database-based persistent stores for JMS and TLOGs, you must create two data sources: one for the TLOGs persistent store and one for the JMS persistent store.

For an enterprise deployment, you should use GridLink data sources for your TLOGs and JMS stores. To create a GridLink data source:

1. Log in to the Oracle WebLogic Server Administration Console.
2. If you have not already done so, in the **Change Center**, click **Lock & Edit**.
3. In the **Domain Structure** tree, expand **Services**, then select **Data Sources**.
4. On the Summary of Data Sources page, click **New** and select **GridLink Data Source**, and enter the following:

- Enter a logical name for the data source in the **Name** field.
For the TLOGs store, enter TLOG; for the JMS store, enter JMS.
 - Enter a name for **JNDI**.
For the TLOGs store, enter jdbc/tlogs; for the JMS store, enter jdbc/jms.
 - For the Database Driver, select **Oracle's Driver (Thin) for GridLink Connections Versions: Any**.
 - Click **Next**.
5. In the Transaction Options page, clear the **Supports Global Transactions** check box, and then click **Next**.

Supports Global Transactions

6. In the GridLink Data Source Connection Properties Options screen, select **Enter individual listener information** and click **Next**.

7. Enter the following connection properties:

- **Service Name:** Enter the service name of the database with lowercase characters. For a GridLink data source, you must enter the Oracle RAC service name. For example:

wccedg.example.com

- **Host Name and Port:** Enter the SCAN address and port for the RAC database, separated by a colon. For example:

db-scan.example.com:1521

Click **Add** to add the host name and port to the list box below the field.

Enter host and port of each listener separated by colon and click the add button. In the case of a RAC DB listener, specify the SCAN address.

Host and Port:

Add

db-scan.example.com:1521

Remove

You can identify the SCAN address by querying the appropriate parameter in the database using the TCP Protocol:

```
SQL>show parameter remote_listener;
```

NAME	TYPE	VALUE
remote_listener	string	db-scan.example.com

Note:

For Oracle Database 11g Release 1 (11.1), use the virtual IP and port of each database instance listener, for example:

```
dbhost1-vip.mycompany.com (port 1521)
```

and

```
dbhost2-vip.mycompany.com (1521)
```

- **Database User Name:** Enter the following:
For the TLOGs store, enter `TLOGS`; for the JMS persistent store, enter `JMS`.
 - **Password:** Enter the password you used when you created the user in the database.
 - **Confirm Password:** Enter the password again and click **Next**.
8. On the Test GridLink Database Connection page, review the connection parameters and click **Test All Listeners**.

Here is an example of a successful connection notification:

```
Connection test for
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=db-
scan.example.com)
(PORT=1521))))(CONNECT_DATA=(SERVICE_NAME=wccedg.example.com))) succeeded.
```

Click **Next**.

9. In the ONS Client Configuration page, do the following:
- Select **FAN Enabled** to subscribe to and process Oracle FAN events.
 - Enter here also the SCAN address: ONS remote port for the RAC database and the ONS remote port as reported by the database (example below) and click **Add**:

```
[orcl@db-scan1 ~]$ srvctl config nodeapps -s
```


ONS exists: Local port 6100, remote port 6200, EM port 2016
 - Click **Next**.

Note:

For Oracle Database 11g Release 1 (11.1), use the hostname and port of each database's ONS service, for example:

```
custdbhost1.example.com (port 6200)
```

and

```
custdbhost2.example.com (6200)
```

10. On the Test ONS Client Configuration page, review the connection parameters and click **Test All ONS Nodes**.

Here is an example of a successful connection notification:

```
Connection test for db-scan.example.com:6200 succeeded.
```

Click **Next**.

11. In the **Select Targets** page, select the cluster that will be using the persistent store, and then select **All Servers in the cluster**.
12. Click **Finish**.
13. To activate these changes, in the **Change Center** of the Administration Console, click **Activate Changes**.
14. Repeat step 4 through step 13 to create the GridLink Data Source for JMS File Stores.

17.4.9 Assigning the TLOGs JDBC store to the Managed Servers

After you create the tablespace and user in the database, and you have created the datasource, you can then assign the TLOGs persistence store to each of the required Managed Servers.

1. Login in to the Oracle WebLogic Server Administration Console.
2. In the **Change Center**, click **Lock and Edit**.
3. In the Domain Structure tree, expand **Environment**, then **Servers**.
4. Click the name of the Managed Server you want to use the TLOGs store.
5. Select the **Configuration > Services** tab.
6. Under **Transaction Log Store**, select **JDBC** from the **Type** menu.
7. From the **Data Source** menu, select the data source you created for the TLOGs persistence store.
8. In the **Prefix Name** field, specify a prefix name to form a unique JDBC TLOG store name for each configured JDBC TLOG store
9. Click **Save**.
10. Repeat steps 3 to 7 for each of the additional Managed Servers in the cluster.
11. To activate these changes, in the **Change Center** of the Administration Console, click **Activate Changes**.

17.4.10 Creating a JDBC JMS Store

After you create the JMS persistent store user and table space in the database, and after you create the data source for the JMS persistent store, you can then use the Administration Console to create the store.

1. Log in to the Oracle WebLogic Server Administration Console.
2. If you have not already done so, in the **Change Center**, click **Lock & Edit**.

3. In the **Domain Structure** tree, expand **Services**, then select **Persistent Store**.
4. Click **New**, and then click **JDBC Store**.
5. Enter a persistent store name that easily relates it to the pertaining JMS servers that will be using it.
6. Specify a unique prefix qualifying the installation and cluster and associate it with the data source you created for the JMS persistent store.
7. Target the store to the entity that will host the JTA services.

In the case of a server using service migration, this will be the migratable target to which the JMS server belongs.
8. To activate these changes, in the Change Center of the Administration Console, click **Activate Changes**.

17.4.11 Assigning the JMS JDBC store to the JMS Servers

After you create the JMS tablespace and user in the database, create the JMS datasource, and create the JDBC store, then you can then assign the JMS persistence store to each of the required JMS Servers.

1. Login in to the Oracle WebLogic Server Administration Console.
2. In the **Change Center**, click **Lock and Edit**.
3. In the Domain Structure tree, expand **Services**, then **Messaging**, then **JMS Servers**.
4. Click the name of the JMS Server that you want to use the persistent store.
5. From the **Persistent Store** menu, select the JMS persistent store you created earlier.
6. Click **Save**.
7. Repeat steps 3 to 6 for each of the additional JMS Servers in the cluster.
8. To activate these changes, in the Change Center of the Administration Console, click **Activate Changes**.

17.4.12 Creating the Required Tables for the JMS JDBC Store

The final step in using a JDBC persistent store for JMS is to create the required JDBC store tables. Perform this task before restarting the Managed Servers in the domain.

1. Review the information in [Performance Impact of the TLOGs and JMS Persistent Stores](#), and decide which table features are appropriate for your environment..

There are three Oracle DB schema definitions provided in this release and were extracted for review in the previous step. The basic definition includes the RAW data type without any partition for indexes. The second uses the blob data type, and the third uses the blob data type and secure files.

2. Create a domain-specific well-named folder structure for the custom DDL file on shared storage. The ORACLE_RUNTIME shared volume is recommended so it is available to all servers.

Example:

```
mkdir -p ORACLE_RUNTIME/domain_name/ddl
```

3. Create a `jms_custom.ddl` file in new shared ddl folder based on your requirements analysis.

For example, to implement an optimized schema definition that uses both secure files and hash partitioning, create the `jms_custom.ddl` file with the following content:

```
CREATE TABLE $TABLE (
  id      int not null,
  type    int not null,
  handle  int not null,
  record  blob not null,
  PRIMARY KEY (ID) USING INDEX GLOBAL PARTITION BY HASH (ID) PARTITIONS 8)
LOB (RECORD) STORE AS SECUREFILE (ENABLE STORAGE IN ROW);
```

This example can be compared to the default schema definition for JMS stores, where the RAW data type is used without any partitions for indexes.

Note that the number of partitions should be a power of two. This will ensure that each partition will be a similar size. The recommended number of partitions will vary depending on the expected table or index growth. You should have your database administrator (DBA) analyze the growth of the tables over time and adjust the tables accordingly. For more information, see *Partitioning Concepts in Database VLDB and Partitioning Guide*.

4. Use the Administration Console to edit the existing JDBC Store you created earlier; create the table that will be used for the JMS data:
 - a. Login in to the Oracle WebLogic Server Administration Console.
 - b. In the **Change Center**, click **Lock and Edit**.
 - c. In the Domain Structure tree, expand **Services**, then **Persistent Stores**.
 - d. Click the persistent store you created earlier.
 - e. Under the **Advanced** options, enter `ORACLE_RUNTIME/domain_name/ddl/jms_custom.ddl` in the **Create Table from DDL File** field.
 - f. Click **Save**.
 - g. To activate these changes, in the Change Center of the Administration Console, click **Activate Changes**.
5. Restart the Managed Servers.

17.5 Performing Backups and Recoveries for an Enterprise Deployment

It is recommended that you follow the below mentioned guidelines for making sure you back up the necessary directories and configuration data for an Oracle WebCenter Content enterprise deployment.

Note:

Some of the static and run-time artifacts listed in this section are hosted from Network Attached Storage (NAS). If possible, backup and recover these volumes from the NAS filer directly rather than from the application servers.

For general information about backing up and recovering Oracle Fusion Middleware products, see the following sections in *Oracle Fusion Middleware Administering Oracle Fusion Middleware*:

- Backing Up Your Environment
- Recovering Your Environment

[Table 17-1](#) lists the static artifacts to back up in a typical Oracle WebCenter Content enterprise deployment.

Table 17-1 Static Artifacts to Back Up in the Oracle WebCenter Content Enterprise Deployment

Type	Host	Tier
Database Oracle home	DBHOST1 and DBHOST2	Data Tier
Oracle Fusion Middleware Oracle home	WEBHOST1 and WEBHOST2	Web Tier
Oracle Fusion Middleware Oracle home	WCCHOST1 and WCCHOST2 (or NAS Filer)	Application Tier
Installation-related files	WEBHOST1, WEHOST2, and shared storage	N/A

[Table 17-2](#) lists the runtime artifacts to back up in a typical Oracle WebCenter Content enterprise deployment.

Table 17-2 Run-Time Artifacts to Back Up in the Oracle WebCenter Content Enterprise Deployment

Type	Host	Tier
Administration Server domain home (ASERVER_HOME)	WCCHOST1 (or NAS Filer)	Application Tier
Application home (APPLICATION_HOME)	WCCHOST1 (or NAS Filer)	Application Tier
Oracle RAC databases	DBHOST1 and DBHOST2	Data Tier
Scripts and Customizations	Per host	Application Tier
Deployment Plan home (DEPLOY_PLAN_HOME)	WCCHOST1 (or NAS Filer)	Application Tier
OHS Configuration directory	WEBHOST1 and WEBHOST2	Web Tier

17.6 Modifying the Upload and Stage Directories to an Absolute Path

After configuring the domain and unpacking it to the Managed Server domain directories on all the hosts, verify and update the upload and stage directories for Managed Servers in the new clusters. If implementing dynamic clusters, the configuration of the server template assigned to each newly added cluster should be verified and updated, otherwise, verify and update every statically-defined Managed Server for the newly added clusters.

Note: This option is applicable only for static clusters.

This step is necessary to avoid potential issues when performing remote deployments and for deployments that require the stage mode.

To update these directory paths for all the Managed Servers in the Managed Server domain home directory:

1. Log in to the Oracle WebLogic Server Administration Console.
2. In the left navigation tree, expand **Domain**, and then **Environment**.
3. Click **Lock & Edit**.
4. Navigate to and edit the appropriate objects for your cluster type.
 - a. For Static Clusters, navigate to Servers and click on the name of the Managed Server to be edited.
 - b. For Dynamic Clusters, navigate to **Clusters > Server Templates**, and click on the name of the server template to be edited.
5. For each new Managed Server or Server Template to be edited:
 - a. Click the **Configuration** tab, and then click the **Deployment** tab.
 - b. Verify that the **Staging Directory Name** is set to the following:

MSERVER_HOME/servers/server_or_template_name/stage

Replace *MSERVER_HOME* with the directory path for the *MSERVER_HOME* directory; If using static clusters, update with the correct name of the Managed Server you are editing.

If using dynamic clusters, leave the template name intact.

For example: */u02/oracle/config/domains/wcedg_domain/servers/XYZ-server-template/stage*

- c. Update the **Upload Directory Name** to the following value:

ASERVER_HOME/servers/AdminServer/upload

Replace *ASERVER_HOME* with the directory path for the *ASERVER_HOME* directory.
 - d. Click **Save**.
 - e. Return to the Summary of Servers or Summary of Server Templates screen as applicable.
6. When you have modified all of the appropriate objects, click **Activate Changes**.
 7. Restart all Managed Servers effected by these change.

17.7 Starting and Stopping Servers in Dynamic Clusters

You can start and stop server instances in dynamic clusters by using the same methods you use to start and stop server instances in configured static clusters.

Methods to start and stop server instances in configured clusters:

- WebLogic Server Administration Console
- Fusion Middleware Control
- WLST start and shutdown commands
- Node Manager
- Start scripts

Depending on which startup method you choose and the tasks you have already performed, you may have to follow several other procedures before you can start server instances. For more information, see *Starting and Stopping Servers* section in *Oracle Fusion Middleware Administering Server Startup and Shutdown for Oracle WebLogic Server*.

Note: Before you begin, ensure that WebLogic Server is installed on all hosts where you want to run your server instances. If you want to use Node Manager to start and stop your server instances, then you must also run Node Manager on these hosts.

17.8 Expanding or Reducing Dynamic Clusters

When you create a dynamic cluster, WebLogic Server generates the number of dynamic servers you specify. Before you decide upon the number of server instances, ensure you have the performance capacity to handle the desired number.

The number of dynamic server instances available are based on the configured maximum specified in the server template for a given dynamic cluster. Transient changes in capacity requirements can be easily met by starting or stopping some of the available managed servers within the cluster, keeping in mind that a minimum of two or three are required to maintain high-availability.

If you need additional server capacity on top of the number of server instances you originally specified, you can increase the maximum number of dynamic servers in the dynamic cluster configuration. To reduce the number of server instances in the dynamic cluster, decrease the value of the maximum number of dynamic servers attribute. Before lowering this value, shut down the server instances you plan to remove.

You can also use the WLST `scaleUp` and `scaleDown` commands to manage your dynamic cluster. To increase the number of dynamic servers in the dynamic cluster, use the `scaleUp` command and enable the `updateConfiguration` argument. WLST will increase the maximum size of the cluster by the specified number of servers and start the server instances.

The `scaleUp` command increases the number of running servers for the specified dynamic cluster. The non-running server instance with the lowest server ID starts first, followed by the next highest non-running server ID, until the specified number of server instances is started.

You can start one, all, or any number of server instances in the dynamic cluster by specifying the desired number with the `numServers` argument in the `scaleUp` command. If all available server instances are already running, the `scaleUp` command increases the size of the cluster to the minimum number of requested server instances before starting the specified number of servers.

To decrease the maximum size of the dynamic cluster, use the `scaleDown` command and enable the `updateConfiguration` argument. WLST will gracefully shut down

the specified number of running server instances and remove them from the dynamic cluster. For more information, see `scaleUp` and `scaleDown` in *Oracle Fusion Middleware WLST Command Reference for WebLogic Server*. The `scaleDown` command gracefully shuts down the specified number of running servers. The server instance with the highest server ID shuts down first, followed by the next highest ID, until the specified number of server instances is shut down. For more information, see `scaleUp` and `scaleDown` in *Oracle Fusion Middleware WLST Command Reference for WebLogic Server*.

Note:

You can only use the WLST `scaleUp` and `scaleDown` commands with dynamic server instances. In a mixed cluster, containing both manually configured and dynamic server instances, the `scaleUp` and `scaleDown` commands ignore the configured servers. You must manually start and stop configured server instances in a mixed cluster.

For example, a cluster contains two running dynamic servers and two non-running configured servers. If you use the `scaleUp` command, WLST adds one additional dynamic server instance to your cluster and starts the dynamic server.

The WLST `scaleUp` and `scaleDown` commands provide ways to manually scale your dynamic cluster. For automatic scaling, you can configure elasticity for your dynamic cluster. Elasticity enables a dynamic cluster to perform scaling and re-provisioning operations automatically in response to demand or on a calendar based schedule. WebLogic Server provides elasticity for dynamic clusters through the Policies and Actions system of the WebLogic Diagnostic Framework (WLDF). For more information, see *Configuring Elasticity in Dynamic Clusters for Oracle WebLogic Server*.

Using Whole Server Migration and Service Migration in an Enterprise Deployment

The Oracle WebLogic Server migration framework supports Whole Server Migration and Service Migration. The following sections explain how these features can be used in an Oracle Fusion Middleware enterprise topology.

[About Whole Server Migration and Automatic Service Migration in an Enterprise Deployment](#)

Oracle WebLogic Server provides a migration framework that is an integral part of any highly available environment. The following sections provide more information about how this framework can be used effectively in an enterprise deployment.

[Creating a GridLink Data Source for Leasing](#)

Whole Server Migration and Automatic Service Migration require a data source for the leasing table, which is a tablespace created automatically as part of the Oracle WebLogic Server schemas by the Repository Creation Utility (RCU).

[Configuring Whole Server Migration for an Enterprise Deployment](#)

After you have prepared your domain for whole server migration or automatic service migration, you can configure Whole Server Migration for specific Managed Servers within a cluster.

[Configuring Automatic Service Migration in an Enterprise Deployment](#)

You may need to configure automatic service migration for specific services in an enterprise deployment.

18.1 About Whole Server Migration and Automatic Service Migration in an Enterprise Deployment

Oracle WebLogic Server provides a migration framework that is an integral part of any highly available environment. The following sections provide more information about how this framework can be used effectively in an enterprise deployment.

[Understanding the Difference between Whole Server and Service Migration](#)

[Implications of Using Whole Server Migration or Service Migration in an Enterprise Deployment](#)

[Understanding Which Products and Components Require Whole Server Migration and Service Migration](#)

18.1.1 Understanding the Difference between Whole Server and Service Migration

The Oracle WebLogic Server migration framework supports two distinct types of automatic migration:

- **Whole Server Migration**, where the Managed Server instance is migrated to a different physical system upon failure.

Whole server migration provides for the automatic restart of a server instance, with all of its services, on a different physical machine. When a failure occurs in a server that is part of a cluster that is configured with server migration, the server is restarted on any of the other machines that host members of the cluster.

For this to happen, the servers need to use a floating IP as listen address and the required resources (transactions logs and JMS persistent stores) must be available on the candidate machines.

For more information, see *Whole Server Migration in Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

- **Service Migration**, where specific services are moved to a different Managed Server within the cluster.

To understand service migration, it's important to understand *pinned services*.

In a WebLogic Server cluster, most subsystem services are hosted homogeneously on all server instances in the cluster, enabling transparent failover from one server to another. In contrast, pinned services, such as JMS-related services, the JTA Transaction Recovery Service, and user-defined singleton services, are hosted on individual server instances within a cluster—for these services, the WebLogic Server migration framework supports failure recovery with service migration, as opposed to failover.

For more information, see *Understanding the Service Migration Framework in Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

18.1.2 Implications of Using Whole Server Migration or Service Migration in an Enterprise Deployment

When a server or service is started in another system, the required resources (such as services data and logs) must be available to both the original system and to the failover system; otherwise, the service cannot resume the same operations successfully on the failover system.

For this reason, both whole server and service migration require that all members of the cluster have access to the same transaction and JMS persistent stores (whether the persistent store is file-based or database-based).

This is another reason why shared storage is important in an enterprise deployment. When you properly configure shared storage, you ensure that in the event of a manual failover (Administration Server failover) or an automatic failover (whole server migration or service migration), both the original machine and the failover machine can access the same file store with no change in service.

In the case of an automatic service migration, when a pinned service needs to be resumed, the JMS and JTA logs that it was using before failover need to be accessible.

In addition to shared storage, Whole Server Migration requires the procurement and assignment of a virtual IP address (VIP). When a Managed Server fails over to another machine, the VIP is automatically reassigned to the new machine.

Note that service migration does not require a VIP.

18.1.3 Understanding Which Products and Components Require Whole Server Migration and Service Migration

Note that the table lists the recommended best practice. It does not preclude you from using Whole Server or Automatic Server Migration for those components that support it.

Component	Whole Server Migration (WSM)	Automatic Service Migration (ASM)
Oracle WebCenter Content	NO	YES
Oracle SOA Suite	NO	YES
Oracle Enterprise Capture	NO	YES

18.2 Creating a GridLink Data Source for Leasing

Whole Server Migration and Automatic Service Migration require a data source for the leasing table, which is a tablespace created automatically as part of the Oracle WebLogic Server schemas by the Repository Creation Utility (RCU).

For an enterprise deployment, you should create a GridLink data source:

1. Log in to the Oracle WebLogic Server Administration Console.
2. If you have not already done so, in the **Change Center**, click **Lock & Edit**.
3. In the **Domain Structure** tree, expand **Services**, then select **Data Sources**.
4. On the Summary of Data Sources page, click **New** and select **GridLink Data Source**, and enter the following:
 - Enter a logical name for the data source in the **Name** field. For example, **Leasing**.
 - Enter a name for **JNDI**. For example, **jdbc/leasing**.
 - For the Database Driver, select **Oracle's Driver (Thin) for GridLink Connections Versions: Any**.
 - Click **Next**.
5. In the Transaction Options page, clear the **Supports Global Transactions** check box, and then click **Next**.

Supports Global Transactions
6. In the GridLink Data Source Connection Properties Options screen, select **Enter individual listener information** and click **Next**.
7. Enter the following connection properties:

- **Service Name:** Enter the service name of the database with lowercase characters. For a GridLink data source, you must enter the Oracle RAC service name. For example:

wccedg.example.com

- **Host Name and Port:** Enter the SCAN address and port for the RAC database, separated by a colon. For example:

db-scan.example.com:1521

Click **Add** to add the host name and port to the list box below the field.

Enter host and port of each listener separated by colon and click the add button. In the case of a RAC DB listener, specify the SCAN address.

Host and Port:

You can identify the SCAN address by querying the appropriate parameter in the database using the TCP Protocol:

```
SQL>show parameter remote_listener;
```

NAME	TYPE	VALUE
remote_listener	string	db-scan.example.com

Note:

For Oracle Database 11g Release 1 (11.1), use the virtual IP and port of each database instance listener, for example:

dbhost1-vip.mycompany.com (port 1521)

and

dbhost2-vip.mycompany.com (1521)

For Oracle Database 10g, use multi data sources to connect to an Oracle RAC database. For information about configuring multi data sources see [Using Multi Data Sources with Oracle RAC](#).

- **Database User Name:** Enter the following:

FMW1221_WLS_RUNTIME

In this example, FMW1221 is the prefix you used when you created the schemas as you prepared to configure the initial enterprise manager domain.

Note that in previous versions of Oracle Fusion Middleware, you had to manually create a user and tablespace for the migration leasing table. In Fusion Middleware 12c (12.2.1), the leasing table is created automatically when you create the WLS schemas with the Repository Creation Utility (RCU).

- **Password:** Enter the password you used when you created the WLS schema in RCU.
 - **Confirm Password:** Enter the password again and click **Next**.
8. On the Test GridLink Database Connection page, review the connection parameters and click **Test All Listeners**.

Here is an example of a successful connection notification:

```
Connection test for
jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=db-
scan.example.com)
(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=wccedg.example.com))) succeeded.
```

Click **Next**.

9. In the ONS Client Configuration page, do the following:
- Select **FAN Enabled** to subscribe to and process Oracle FAN events.
 - Enter the SCAN address in the **ONS Host and Port** field, and then click **Add** and click **Add**:

This value should be the ONS host and ONS remote port for the RAC database. To find the ONS remote port for the database, you can use the following command on the database host:

```
[orcl@db-scan1 ~]$ srvctl config nodeapps -s
```

```
ONS exists: Local port 6100, remote port 6200, EM port 2016
```

- Click **Next**.

Note:

For Oracle Database 11g Release 1 (11.1), use the hostname and port of each database's ONS service, for example:

```
custdbhost1.example.com (port 6200)
```

and

```
custdbhost2.example.com (6200)
```

10. On the Test ONS Client Configuration page, review the connection parameters and click **Test All ONS Nodes**.

Here is an example of a successful connection notification:

```
Connection test for db-scan.example.com:6200 succeeded.
```

Click **Next**.

11. In the Select Targets page, select the cluster that you are configuring for Whole Server Migration or Automatic Service Migration, and then select **All Servers in the cluster**.
12. Click **Finish**.

13. Click **Activate Changes**.

18.3 Configuring Whole Server Migration for an Enterprise Deployment

After you have prepared your domain for whole server migration or automatic service migration, you can configure Whole Server Migration for specific Managed Servers within a cluster.

[Editing the Node Manager's Properties File to Enable Whole Server Migration](#)

[Setting Environment and Superuser Privileges for the wlsifconfig.sh Script](#)

[Configuring Server Migration Targets](#)

[Testing Whole Server Migration](#)

18.3.1 Editing the Node Manager's Properties File to Enable Whole Server Migration

Use the section to edit the Node Manager properties file on the two nodes where the servers are running.

1. Locate and open the following file with a text editor:

```
MSERVER_HOME/nodemanager/nodemanager.properties
```

2. If not done already, set the `StartScriptEnabled` property in the `nodemanager.properties` file to `true`.

This is required to enable Node Manager to start the managed servers.

3. Add the following properties to the `nodemanager.properties` file to enable server migration to work properly:

- `Interface`

```
Interface=eth0
```

This property specifies the interface name for the floating IP (`eth0`, for example).

Note:

Do not specify the sub interface, such as `eth0:1` or `eth0:2`. This interface is to be used without the `:0`, or `:1`.

The Node Manager's scripts traverse the different `:X` enabled IPs to determine which to add or remove. For example, the valid values in Linux environments are `eth0`, `eth1`, or, `eth2`, `eth3`, `ethn`, depending on the number of interfaces configured.

- `NetMask`

```
NetMask=255.255.255.0
```

This property specifies the net mask for the interface for the floating IP.

- `UseMACBroadcast`

```
UseMACBroadcast=true
```

This property specifies whether or not to use a node's MAC address when sending ARP packets, that is, whether or not to use the `-b` flag in the `arping` command.

4. Restart the Node Manager.
5. Verify in the output of Node Manager (the shell where the Node Manager is started) that these properties are in use. Otherwise, problems may occur during migration. The output should be similar to the following:

```
...
SecureListener=true
LogCount=1
eth0=*,NetMask=255.255.255.0
...
```

18.3.2 Setting Environment and Superuser Privileges for the `wlsifconfig.sh` Script

Use this section to set the environment and superuser privileges for the `wlsifconfig.sh` script, which is used to transfer IP addresses from one machine to another during migration. It must be able to run `ifconfig`, which is generally only available to superusers.

For more information about the `wlsifconfig.sh` script, see *Configuring Automatic Whole Server Migration* in *Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

Refer to the following sections for instructions on preparing your system to run the `wlsifconfig.sh` script.

[Setting the PATH Environment Variable for the `wlsifconfig.sh` Script](#)

[Granting Privileges to the `wlsifconfig.sh` Script](#)

18.3.2.1 Setting the PATH Environment Variable for the `wlsifconfig.sh` Script

Ensure that the commands listed in the following table are included in the PATH environment variable for each host computers.

File	Directory Location
<code>wlsifconfig.sh</code>	<code>MSERVER_HOME/bin/server_migration</code>
<code>wlscontrol.sh</code>	<code>WL_HOME/common/bin</code>
<code>nodemanager.domains</code>	<code>MSERVER_HOME/nodemanager</code>

18.3.2.2 Granting Privileges to the `wlsifconfig.sh` Script

Grant `sudo` privilege to the operating system user (for example, `oracle`) with no password restriction, and grant `execute` privilege on the `/sbin/ifconfig` and `/sbin/arping` binaries.

Note:

For security reasons, `sudo` should be restricted to the subset of commands required to run the `wlsifconfig.sh` script.

Ask the system administrator for the `sudo` and system rights as appropriate to perform this required configuration task.

The following is an example of an entry inside `/etc/sudoers` granting `sudo` execution privilege for `oracle` to run `ifconfig` and `arping`:

```
Defaults:oracle !requiretty
oracle ALL=NOPASSWD: /sbin/ifconfig,/sbin/arping
```

18.3.3 Configuring Server Migration Targets

To configure migration in a cluster:

1. Log in to the Oracle WebLogic Server Administration Console.
2. In the Domain Structure window, expand **Environment** and select **Clusters**. The Summary of Clusters page appears.
3. Click the cluster for which you want to configure migration in the Name column of the table.
4. Click the **Migration** tab.
5. Click **Lock & Edit**.
6. Select **Database** as Migration Basis. From the drop-down list, select **Leasing** as Data Source For Automatic Migration.
7. Under **Candidate Machines For Migratable Server**, in the Available filed, select the Managed Servers in the cluster and click the right arrow to move them to **Chosen**.
8. Select the Leasing data source that you created in [Creating a GridLink Data Source for Leasing](#).
9. Click **Save**.
10. Set the Candidate Machines for Server Migration. You must perform this task for all of the managed servers as follows:
 - a. In Domain Structure window of the Oracle WebLogic Server Administration Console, expand **Environment** and select **Servers**.
 - b. Select the server for which you want to configure migration.
 - c. Click the **Migration** tab.
 - d. Select **Automatic Server Migration Enabled** and click **Save**.

This enables the Node Manager to start a failed server on the target node automatically.

For information on targeting applications and resources, see [Using Multi Data Sources with Oracle RAC](#).

- e. In the **Available** field, located in the Migration Configuration section, select the machines to which to allow migration and click the right arrow.

In this step, you are identifying host to which the Managed Server should failover if the current host is unavailable. For example, for the Managed Server on the HOST1, select HOST2; for the Managed Server on HOST2, select HOST1.

Tip:

Click **Customize this table** in the Summary of Servers page, move Current Machine from the Available Window to the Chosen window to view the machine on which the server is running. This is different from the configuration if the server is migrated automatically.

11. Click **Activate Changes**.
12. Restart the Administration Server and the servers for which server migration has been configured.

18.3.4 Testing Whole Server Migration

Perform the steps in this section to verify that automatic whole server migration is working properly.

To test from Node 1:

1. Stop the managed server process.

```
kill -9 pid
```

pid specifies the process ID of the managed server. You can identify the pid in the node by running this command:

```
ps -ef | grep WLS_WCC1
```

2. Watch the Node Manager console (the terminal window where you performed the kill command): you should see a message indicating that the managed server's floating IP has been disabled.
3. Wait for the Node Manager to try a second restart of the Managed Server. Node Manager waits for a period of 30 seconds before trying this restart.
4. After node manager restarts the server and before it reaches "RUNNING" state, kill the associated process again.

Node Manager should log a message indicating that the server will not be restarted again locally.

Note:

The number of restarts required is determined by the `RestartMax` parameter in the following configuration file:

```
MSERVER_HOME/servers/WLS_WCC1/data/nodemanager/startup.properties
```

The default value is `RestartMax=2`.

To test from Node 2:

1. Watch the local Node Manager console. After 30 seconds since the last try to restart the managed server on Node 1, Node Manager on Node 2 should prompt that the floating IP for the managed server is being brought up and that the server is being restarted in this node.
2. Access a product URL using same IP address. If the URL is successful, then the migration was successful.

Verification From the Administration Console

You can also verify migration using the Oracle WebLogic Server Administration Console:

1. Log in to the Administration Console.
2. Click **Domain** on the left console.
3. Click the **Monitoring** tab and then the **Migration** subtab.

The Migration Status table provides information on the status of the migration.

Note:

After a server is migrated, to fail it back to its original machine, stop the managed server from the Oracle WebLogic Administration Console and then start it again. The appropriate Node Manager starts the managed server on the machine to which it was originally assigned.

18.4 Configuring Automatic Service Migration in an Enterprise Deployment

You may need to configure automatic service migration for specific services in an enterprise deployment.

[Setting the Leasing Mechanism and Data Source for an Enterprise Deployment Cluster](#)

[Changing the Migration Settings for the Managed Servers in the Cluster](#)

[About Selecting a Service Migration Policy](#)

[Setting the Service Migration Policy for Each Managed Server in the Cluster](#)

[Validating Automatic Service Migration](#)

[Failing Back Services After Automatic Service Migration](#)

18.4.1 Setting the Leasing Mechanism and Data Source for an Enterprise Deployment Cluster

Before you can configure automatic service migration, you must verify the leasing mechanism and data source that will be used by the automatic service migration feature:

Note:

The following procedure assumes you have already created the Leasing data source, as described in [Creating a GridLink Data Source for Leasing](#).

1. Log in to the Oracle WebLogic Server Administration Console.
2. Click **Lock & Edit**.
3. In the Domain Structure window, expand **Environment** and select **Clusters**.
The Summary of Clusters page appears.
4. In the **Name** column of the table, click the cluster for which you want to configure migration.
5. Click the **Migration** tab.
6. Verify that **Database** is selected in the **Migration Basis** drop-down menu.
7. From the **Data Source for Automatic Migration** drop-down menu, select the Leasing data source that you created in [Creating a GridLink Data Source for Leasing](#).
8. Click **Save**.
9. Activate changes.
10. Restart the Managed Servers.

18.4.2 Changing the Migration Settings for the Managed Servers in the Cluster

After you set the leasing mechanism and data source for the cluster, you can then enable automatic JTA migration for the Managed Servers that you want to configure for service migration. Note that this topic applies only if you are deploying JTA services as part of your enterprise deployment.

For example, this task is not required for Oracle WebCenter Content enterprise deployments.

To change the migration settings for the Managed Servers in each cluster:

1. If you haven't already, log in to the Administration Console, and click **Lock & Edit**.
2. In the Domain Structure pane, expand the **Environment** node and then click **Servers**.
The Summary of Servers page appears.
3. Click the name of the server you want to modify in **Name** column of the table.
The settings page for the selected server appears and defaults to the Configuration tab.
4. Click the **Migration** tab.
5. From the **JTA Migration Policy** drop-down menu, select **Failure Recovery**.

6. In the **JTA Candidate Servers** section of the page, select the Managed Servers in the **Available** list box, and then click the move button to move them into the **Chosen** list box.
7. In the **JMS Service Candidate Servers** section of the page, select the Managed Servers in the **Available** list box, and then click the move button to move them into the **Chosen** list box.
8. Click **Save**.
9. Restart all the Managed Servers and the Administration Server.

18.4.3 About Selecting a Service Migration Policy

When you configure Automatic Service Migration, you select a Service Migration Policy for each cluster. This topic provides guidelines and considerations when selecting the Service Migration Policy.

For example, products or components running singletons or using Path services can benefit from the **Auto-Migrate Exactly-Once** policy. With this policy, if at least one Managed Server in the candidate server list is running, the services hosted by this migratable target will be active somewhere in the cluster if servers fail or are administratively shut down (either gracefully or forcibly). This can cause multiple homogenous services to end up in one server on startup.

When you are using this policy, you should monitor the cluster startup to identify what servers are running on each server. You can then perform a manual fallback, if necessary, to place the system in a balanced configuration.

Other Fusion Middleware components are better suited for the **Auto-Migrate Failure-Recovery Services** policy.

Based on these guidelines, you should use **Auto-Migration Failure-Recovery Services** for the clusters in an Oracle WebCenter Content enterprise deployment.

For more information, see *Policies for Manual and Automatic Service Migration in Oracle Fusion Middleware Administering Clusters for Oracle WebLogic Server*.

18.4.4 Setting the Service Migration Policy for Each Managed Server in the Cluster

After you modify the migration settings for each server in the cluster, you can then identify the services and set the migration policy for each Managed Server in the cluster, using the WebLogic Administration Console:

1. If you haven't already, log in to the Administration Console, and click **Lock & Edit**.
2. In the Domain Structure pane, expand **Environment**, then expand **Clusters**, then select **Migratable Targets**.
3. Click the name of the first Managed Server in the cluster.
4. Click the **Migration** tab.
5. From the **Service Migration Policy** drop-down menu, select the appropriate policy for the cluster.

For more information, see [About Selecting a Service Migration Policy](#).

6. In the Constrained Candidate Servers section of the page, select both Managed Servers in the **Available** list box and move them to the **Chosen** list box.

7. Click **Save**.
8. Repeat steps 2 through 7 for each of the additional Managed Servers in the cluster.
9. In the Domain Structure pane, select **Environment > Clusters > *cluster_name* > Configuration tab > General tab > Advanced**.
10. In the Service Activation Request Response Timeout field, type 0.
11. Activate the changes.
12. Restart the Managed Servers in the cluster.

18.4.5 Validating Automatic Service Migration

After you configure automatic service migration for your cluster and Managed Servers, validate the configuration, as follows:

1. If you have not already done so, log in to the Administration Console.
2. In the Domain Structure pane, select **Environment**, then **Clusters**.
3. In the Domain Structure pane, expand **Environment**, and then expand **Clusters**.
4. Click **Migratable Targets**.
5. Click the **Control** tab.

The console displays a list of migratable targets and their current hosting server.

6. In the Migratable Targets table, select a row for the one of the migratable targets.
7. Note the value in the **Current Hosting Server** column.
8. Use the operating system command line to stop the first Managed Server.

Use the following command to end the Managed Server Process and simulate a crash scenario:

```
kill -9 pid
```

In this example, replace *pid* with the process ID (PID) of the Managed Server. You can identify the PID by running the following UNIX command:

```
ps -ef | grep managed_server_name
```

Note that after you kill the process, the Managed Server might be configured to start automatically after you initially kill the process. In this case, you must kill the second process using the `kill -9` command again.

9. Watch the terminal window (or console) where the Node Manager is running.

You should see a message indicating that the selected Managed Server has failed. The message will be similar to the following:

```
<INFO> <domain_name> <server_name>
<The server 'server_name' with process id 4668 is no longer alive; waiting for
the process to die.>
<INFO> <domain_name> <server_name>
<Server failed during startup. It may be retried according to the auto restart
configuration.>
<INFO> <domain_name> <server_name>
```

<Server failed but will not be restarted because the maximum number of restart attempts has been exceeded.>

10. Return to the Oracle WebLogic Server Administration Console and refresh the table of migratable targets; verify that the migratable targets are transferred to the remaining, running Managed Server in the cluster:
 - Verify that the Current Hosting Server for the process you killed is now updated to show that it has been migrated to a different host.
 - Verify that the value in the **Status of Last Migration** column for the process is "Succeeded".
11. Open and review the log files for the Managed Servers that are now hosting the services; look for any JTA or JMS errors.

Note:

For JMS tests, it is a good practice to get message counts from destinations and make sure that there are no stuck messages in any of the migratable targets:

For example, for uniform distributed destinations (UDDs):

- a. Access the JMS Subdeployment module in the Administration Console:
In the Domain Structure pane, select **Services**, then **Messaging**, and then **JMS Modules**.
 - b. Click the JMS Module.
 - c. Click the destination in the **Summary of Resources** table. destination->Select monitoring and get the Messages Total and Messages Pending Counts
 - d. Select the Monitoring tab, and review the **Messages Total** and **Messages Pending** values in the **Destinations** table.
-
-

18.4.6 Failing Back Services After Automatic Service Migration

When Automatic Service Migration occurs, Oracle WebLogic Server does not support failing back services to their original server when a server is back online and rejoins the cluster.

As a result, after the Automatic Service Migration migrates specific JMS services to a backup server during a fail-over, it does not migrate the services back to the original server after the original server is back online. Instead, you must migrate the services back to the original server manually.

To fail back a service to its original server, follow these steps:

1. If you have not already done so, in the Change Center of the Administration Console, click **Lock & Edit**.
2. In the Domain Structure tree, expand **Environment**, expand **Clusters**, and then select **Migratable Targets**.
3. To migrate one or more migratable targets at once, on the Summary of Migratable Targets page:

- a. Click the **Control** tab.
 - b. Use the check boxes to select one or more migratable targets to migrate.
 - c. Click **Migrate**.
 - d. Use the **New hosting server** drop-down to select the original Managed Server.
 - e. Click **OK**.

A request is submitted to migrate the JMS-related service and the configuration edit lock is released. In the Migratable Targets table, the Status of Last Migration column indicates whether the requested migration has succeeded or failed.
4. To migrate a specific migratable target, on the Summary of Migratable Targets page:
- a. Select the migratable target to migrate.
 - b. Click the **Control** tab.
 - c. Reselect the migratable target to migrate.
 - d. Click **Migrate**.
 - e. Use the New hosting server drop-down to select a new server for the migratable target.
 - f. Click **OK**.

Configuring Single Sign-On for an Enterprise Deployment

You will need to configure the Oracle HTTP Server WebGate in order to enable single sign-on with Oracle Access Manager.

About Oracle HTTP Server Webgate

Oracle HTTP Server WebGate is a Web server plug-in that intercepts HTTP requests and forwards them to an existing Oracle Access Manager instance for authentication and authorization.

General Prerequisites for Configuring Oracle HTTP Server Webgate

Before you can configure Oracle HTTP Server WebGate, you must have installed and configured a certified version of Oracle Access Manager.

Enterprise Deployment Prerequisites for Configuring OHS 12c Webgate

When you are configuring Oracle HTTP Server Webgate to enable Single Sign-On for an enterprise deployment, consider the prerequisites mentioned in this section.

Configuring Oracle HTTP Server 12c WebGate for an Enterprise Deployment

You will need to perform the following steps in order to configure Oracle HTTP Server 12c WebGate for Oracle Access Manager on both WEBHOST1 and WEBHOST2.

Registering the Oracle HTTP Server WebGate with Oracle Access Manager

You can register the WebGate agent with Oracle Access Manager using the Oracle Access Manager Administration console.

Setting Up the WebLogic Server Authentication Providers

To set up the WebLogic Server authentication providers, back up the configuration files, set up the Oracle Access Manager Identity Assertion Provider and set the order of providers.

Configuring Oracle ADF and OPSS Security with Oracle Access Manager

Some Oracle Fusion Middleware management consoles use Oracle Application Development Framework (Oracle ADF) security, which can integrate with Oracle Access Manager Single Sign On (SSO). These applications can take advantage of Oracle Platform Security Services (OPSS) SSO for user authentication, but you must first configure the domain-level `jps-config.xml` file to enable these capabilities.

19.1 About Oracle HTTP Server Webgate

Oracle HTTP Server WebGate is a Web server plug-in that intercepts HTTP requests and forwards them to an existing Oracle Access Manager instance for authentication and authorization.

For Oracle Fusion Middleware 12c, the WebGate software is installed as part of the Oracle HTTP Server 12c software installation.

For more extensive information about WebGate, see Registering and Managing OAM 11g Agents in *Administrator's Guide for Oracle Access Management*.

19.2 General Prerequisites for Configuring Oracle HTTP Server Webgate

Before you can configure Oracle HTTP Server WebGate, you must have installed and configured a certified version of Oracle Access Manager.

At the time this document was published, the supported versions of Oracle Access Manager were 11g Release 2 (11.1.2.2) and 11g Release 2 (11.1.2.3). For the most up-to-date information, see the certification document for your release on the *Oracle Fusion Middleware Supported System Configurations* page.

Note:

For production environments, it is highly recommended that you install Oracle Access Manager in its own environment and not on the machines that are hosting the enterprise deployment.

For more information about Oracle Access Manager, see the latest Oracle Identity and Access Management documentation, which you can find in the **Middleware** documentation on the [Oracle Help Center](#).

19.3 Enterprise Deployment Prerequisites for Configuring OHS 12c Webgate

When you are configuring Oracle HTTP Server Webgate to enable Single Sign-On for an enterprise deployment, consider the prerequisites mentioned in this section.

- Oracle recommends that you deploy Oracle Access Manager as part of a highly available, secure, production environment. For more information about deploying Oracle Access Manager in an enterprise environment, see the Enterprise Deployment Guide for your version of Oracle Identity and Access Management.
- To enable single sign-on for the WebLogic Server Administration Console and the Oracle Enterprise Manager Fusion Middleware Control, you must add a central LDAP-provisioned administration user to the directory service that Oracle Access Manager is using (for example, Oracle Internet Directory or Oracle Unified Directory). For more information about the required user and groups to add to the LDAP directory, follow the instructions in [Creating a New LDAP Authenticator and Provisioning Enterprise Deployment Users and Group](#).

19.4 Configuring Oracle HTTP Server 12c WebGate for an Enterprise Deployment

You will need to perform the following steps in order to configure Oracle HTTP Server 12c WebGate for Oracle Access Manager on both WEBHOST1 and WEBHOST2.

In the following procedure, replace the directory variables, such as *OHS_ORACLE_HOME* and *OHS_CONFIG_DIR*, with the values, as defined in [File System and Directory Variables Used in This Guide](#).

1. Perform a complete backup of the Web Tier domain.

2. Change directory to the following location in the Oracle HTTP Server Oracle home:

```
cd OHS_ORACLE_HOME/webgate/ohs/tools/deployWebGate/
```

3. Run the following command to create the WebGate Instance directory and enable WebGate logging on OHS Instance:

```
./deployWebGateInstance.sh -w OHS_CONFIG_DIR -oh OHS_ORACLE_HOME
```

4. Verify that a webgate directory and subdirectories was created by the deployWebGateInstance command:

```
ls -lat OHS_CONFIG_DIR/webgate/
total 16
drwxr-x---+ 8 orcl oinstall 20 Oct  2 07:14 ..
drwxr-xr-x+ 4 orcl oinstall  4 Oct  2 07:14 .
drwxr-xr-x+ 3 orcl oinstall  3 Oct  2 07:14 tools
drwxr-xr-x+ 3 orcl oinstall  4 Oct  2 07:14 config
```

5. Run the following command to ensure that the LD_LIBRARY_PATH environment variable contains OHS_ORACLE_HOME/lib directory path:

```
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:OHS_ORACLE_HOME/lib
```

6. Change directory to the following directory

```
OHS_ORACLE_HOME/webgate/ohs/tools/setup/InstallTools
```

7. Run the following command from the InstallTools directory.

```
./EditHttpConf -w OHS_CONFIG_DIR -oh OHS_ORACLE_HOME -o
output_file_name
```

Note:

The `-oh OHS_ORACLE_HOME` and `-o output_file_name` parameters are optional.

This command:

- Copies the `apache_webgate.template` file from the Oracle HTTP Server Oracle home to a new `webgate.conf` file in the Oracle HTTP Server configuration directory.
- Updates the `httpd.conf` file to add one line, so it includes the `webgate.conf`.
- Generates a WebGate configuration file. The default name of the file is `webgate.conf`, but you can use a custom name by using the `-o output_file_name` argument to the command.

19.5 Registering the Oracle HTTP Server WebGate with Oracle Access Manager

You can register the WebGate agent with Oracle Access Manager using the Oracle Access Manager Administration console.

For more information, see Registering an OAM Agent Using the Console in *Administrator's Guide for Oracle Access Management*.

[Locating and Preparing the RREG Tool](#)

[About RREG In-Band and Out-of-Band Mode](#)

[Updating the Standard Properties in the OAM11gRequest.xml File](#)

[Updating the Protected, Public, and Excluded Resources for an Enterprise Deployment](#)

[Running the RREG Tool](#)

[Files and Artifacts Generated by RREG](#)

[Copying Generated Artifacts to the Oracle HTTP Server WebGate Instance Location](#)

[Restarting the Oracle HTTP Server Instance](#)

19.5.1 Locating and Preparing the RREG Tool

To set up the RREG tool, complete the following steps:

1. Log in to one of the Oracle Access Manager hosts in the Application tier.
2. Change directory to the following directory in the Oracle Access Manager Oracle home:

Note: The location is required only for the out-of-band mode.

`OAM_ORACLE_HOME/oam/server/rreg/client`

In this example, `OAM_ORACLE_HOME` refers to the Oracle home on the system where the Oracle Access Manager software was installed.

Note: If the Oracle Enterprise Deployment Guide for IDM was used, `OAM_ORACLE_HOME` may be `/u01/oracle/products/access/iam`.

Note: If you do not have privileges or access to the Oracle Access Manager server, then you can use out-of-band mode to generate the required files and register the WebGate with Oracle Access Manager. For more information, see [About RREG In-Band and Out-of-Band Mode](#).

3. Unzip the `RREG.tar.gz` file to the required directory.
4. From the unzipped directory, open the `oamreg.sh` file and set the following environment variables in the file, as follows:
 - Set `OAM_REG_HOME` to the absolute path to the directory in which you extracted the contents of RREG archive.
Set `JAVA_HOME` to the absolute path of the directory in which a supported JDK is installed on your machine.

19.5.2 About RREG In-Band and Out-of-Band Mode

You can run the RREG Tool in one of two modes: in-band and out-of-band.

Use **in-band** mode when you have the privileges to access the Oracle Access Manager server and run the RREG tool yourself from the Oracle Access Manager Oracle home. You can then copy the generated artifacts and files to the Web server configuration directory after you run the RREG Tool.

Use **out-of-band** mode if you do *not* have privileges or access to the Oracle Access Manager server. For example, in some organizations, only the Oracle Access Manager server administrators have privileges access the server directories and perform administration tasks on the server. In out-of-band mode, the process can work as follows:

1. The Oracle Access Manager server administrator provides you with a copy of the RREG archive file (RREG.tar.gz).

The server administrator can find it in the location described in [Locating and Preparing the RREG Tool](#).

2. Untar the RREG.tar.gz file that was provided to you by the server administrator.

For example:

```
gunzip RREG.tar.gz
tar -xvf RREG.tar
```

After you unpack the RREG archive, you can find the tool for registering the agent in the following location:

```
RREG_HOME/bin/oamreg.sh
```

In this example, *RREG_Home* is the directory in which you extracted the contents of RREG archive.

3. Use the instructions in [Updating the Standard Properties in the OAM11gRequest.xml File](#) to update the OAM11GRequest.xml file, and send the completed OAM11GRequest.xml file to the Oracle Access Manager server administrator.
4. The Oracle Access Manager server administrator then uses the instructions in [Running the RREG Tool in Out-Of-Band Mode](#) to run the RREG Tool and generate the *AgentID_response.xml* file.
5. The Oracle Access Manager server administrator sends the *AgentID_response.xml* file to you.
6. Use the instructions in [Running the RREG Tool in Out-Of-Band Mode](#) to run the RREG Tool with the *AgentID_response.xml* file and generate the required artifacts and files on the client system.

19.5.3 Updating the Standard Properties in the OAM11gRequest.xml File

Before you can register the Webgate agent with Oracle Access Manager, you must update some required properties in the OAM11gRequest.xml file.

Note:

If you plan to use the default values for most of the parameters in the provided XML file, then you can use the shorter version (OAM11gRequest_short.xml, in which all non-listed fields will take a default value.

Note: In the primary server list, the default names are mentioned as OAM_SERVER1 and OAM_SERVER2 for OAM servers. Rename these names in the list if the server names are changed in your environment.

To perform this task:

1. If you are using in-band mode, then change directory to the following location on one of the OAM Servers:

```
OAM_ORACLE_HOME/oam/server/rreg/input
```

If you are using out-of-band mode, then change directory to the location where you unpacked the RREG archive on the WEBHOST1 server.

2. Make a copy of the OAM11GRequest.xml file template with an environment-specific name.

```
cp OAM11GRequest.xml OAM11GRequest_edg.xml
```

3. Review the properties listed in the file, and then update your copy of the OAM11GRequest.xml file to make sure the properties reference the host names and other values specific to your environment.

OAM11gRequest.xml Property	Set to...
serverAddress	The host and the port of the Administration Server for the Oracle Access Manager domain.
agentName	Any custom name for the agent. Typically, you use a name that identifies the Fusion Middleware product you are configuring for single sign-on.
applicationDomain	A value that identifies the Web tier host and the FMW component you are configuring for single sign-on.

OAM11gRequest.xml Property	Set to...
security	<p>Must be set to the security mode configured on the Oracle Access Management server. This will be one of three modes: open, simple, or certificate.</p> <hr/> <p>Note: For an enterprise deployment, Oracle recommends simple mode, unless additional requirements exist to implement custom security certificates for the encryption of authentication and authorization traffic. In most cases, avoid using open mode, because in open mode, traffic to and from the Oracle Access Manager server is not encrypted.</p> <hr/> <p>For more information using certificate mode or about Oracle Access Manager supported security modes in general, see <i>Securing Communication Between OAM Servers and WebGates</i> in the <i>Administrator's Guide for Oracle Access Management</i>.</p>
cachePragmaHeader	private
cacheControlHeader	private
ipValidation	<p>0</p> <pre><ipValidation>0</ipValidation></pre>
ipValidationExceptions	<p>The IP address of the front-end load balancer. For example:</p> <pre><ipValidationExceptions> <ipAddress>130.35.165.42</ipAddress> </ipValidation></pre>
agentBaseUrl	<p>Fully-qualified URL with the host and the port of the front-end Load Balancer VIP in front of the WEBHOST<i>n</i> machines on which Oracle HTTP 12c WebGates are installed.</p> <p>For example:</p> <pre><agentBaseUrl> https://wcp.example.com:443 </agentBaseUrl></pre>

OAM11gRequest.xml Property	Set to...
virtualHost	Set to true when protecting more than the agentBaseUrl, such as SSO protection for the administrative VIP.
hostPortVariationsList	<p>Add hostPortVariation host and port elements for each of the load-balancer URLs that will be protected by the WebGates.</p> <p>For example:</p> <pre><hostPortVariationsList> <hostPortVariations> <host>wcpinternal.example.com</host> <port>80</port> </hostPortVariations> <hostPortVariations> <host>admin.example.com</host> <port>80</port> </hostPortVariations> </hostPortVariationsList></pre>

19.5.4 Updating the Protected, Public, and Excluded Resources for an Enterprise Deployment

When you set up an Oracle Fusion Middleware environment for single sign-on, you identify a set of URLs that you want Oracle Access Manager to protect with single sign-on. You identify these using specific sections of the `OAM11gRequest.xml` file. To identify the URLs:

1. If you haven't already opened `OAM11gRequest.xml` file for editing, locate and open the file in a text editor.

For more information, see the following:

- [Locating and Preparing the RREG Tool](#)
- [Updating the Standard Properties in the OAM11gRequest.xml File](#)

2. Remove the sample entries from the file, and then enter the list of protected, public, and excluded resources in the appropriate sections of the file, as shown in the following example.

Note:

If you are using Oracle Access Manager 11g Release 2 (11.1.2.2) or later, then note that the entries with the wildcard syntax ("`. . . / *`") are included in this example for backward compatibility with previous versions of Oracle Access Manager.

```
<protectedResourcesList>
  <resource>/adfAuthentication</resource>
  <resource>/ibr/adfAuthentication</resource>
  <resource>/imaging/faces</resource>
```

```

<resource>/em</resource>
<resource>/console</resource>
<resource>/DefaultToDoTaskFlow</resource>
<resource>/sdpmessaging/userprefs-ui</resource>
<resource>/integration/worklistapp</resource>
<resource>/workflow/sdpmessaging-sca-ui-worklist</resource>
<resource>/soa/composer</resource>
<resource>/soa-infra/deployer</resource>
<resource>/soa-infra/events/edn-db-log</resource>
<resource>/soa-infra/cluster/info</resource>
<resource>/soa-infra</resource>
<resource>/dc-console/adfAuthentication</resource>
<resource>/dc-client/adfAuthentication</resource>
<resource>/wcc/adfAuthentication</resource>
</protectedResourcesList>
<publicResourcesList>
  <resource>/cs</resource>
  <resource>/_ocsh</resource>
  <resource>/_dav</resource>
  <resource>/imaging</resource>
  <resource>/soa-infra/directWSDL</resource>
  <resource>/dc-console</resource>
  <resource>/wcc</resource>
</publicResourcesList>
<excludedResourcesList>
  <resource>/wsm-pm</resource>
  <resource>/soa-infra/services</resource>
  <resource>/ucs/messaging/webservice</resource>
  <resource>/imaging/ws</resource>
  <resource>/idcnativews</resource>
  <resource>/imaging/lib</resource>
  <resource>/cs/common/idcapplet.jar</resource>
  <resource>/cs/images</resource>
  <resource>/dc-client</resource>
  <resource>/axf-ws</resource>
</excludedResourcesList>

```

3. Save and close the `OAM11GRequest.xml` file.

19.5.5 Running the RREG Tool

The following topics provide information about running the RREG tool to register your Oracle HTTP Server Webgate with Oracle Access Manager.

[Running the RREG Tool in In-Band Mode](#)

[Running the RREG Tool in Out-Of-Band Mode](#)

19.5.5.1 Running the RREG Tool in In-Band Mode

To run the RREG Tool in in-band mode:

1. Navigate to the RREG home directory.

If you are using in-band mode, the RREG directory is inside the Oracle Access Manager Oracle home:

```
OAM_ORACLE_HOME/oam/server/rreg
```

If you are using out-of-band mode, then the RREG home directory is the location where you unpacked the RREG archive.

2. In the RREG home directory, navigate to the bin directory:

```
cd RREG_HOME/bin/
```

3. Set the permissions of the oamreg.sh command so you can execute the file:

```
chmod +x oamreg.sh
```

4. Run the following command:

```
./oamreg.sh inband RREG_HOME/input/OAM11GRequest_edg.xml
```

In this example:

- It is assumed the edited OAM11GRequest.xml file is located in the RREG_HOME/input directory.
- The output from this command will be saved to the following directory:

```
RREG_HOME/output/
```

The following example shows a sample RREG session:

```
Welcome to OAM Remote Registration Tool!
Parameters passed to the registration tool are:
Mode: inband
Filename: /u01/oracle/products/fmw/iam_home/oam/server/rreg/client/rreg/input/
OAM11GRequest_edg.xml
Enter admin username:weblogic_idm
Username: weblogic_idm
Enter admin password:
Do you want to enter a Webgate password?(y/n):
n
Do you want to import an URIs file?(y/n):
n

-----
Request summary:
OAM11G Agent Name:WCC1221_EDG_AGENT
URL String:null
Registering in Mode:inband
Your registration request is being sent to the Admin server at: http://
host1.example.com:7001
-----

Jul 08, 2015 7:18:13 PM oracle.security.jps.util.JpsUtil disableAudit
INFO: JpsUtil: isAuditDisabled set to true
Jul 08, 2015 7:18:14 PM oracle.security.jps.util.JpsUtil disableAudit
INFO: JpsUtil: isAuditDisabled set to true
Inband registration process completed successfully! Output artifacts are created in
the output folder.
```

19.5.5.2 Running the RREG Tool in Out-Of-Band Mode

To run the RREG Tool in out-of-band mode on the WEBHOST server, the administrator uses the following command:

```
RREG_HOME/bin/oamreg.sh outofband input/OAM11GRequest.xml
```

In this example:

- Replace RREG_HOME with the location where the RREG archive file was unpacked on the server.

- The edited `OAM11GRequest.xml` file is located in the `RREG_HOME/input` directory.
- The RREG Tool saves the output from this command (the `AgentID_response.xml` file) to the following directory:

`RREG_HOME/output/`

The Oracle Access Manager server administrator can then send the `AgentID_response.xml` to the user who provided the `OAM11GRequest.xml` file.

To run the RREG Tool in out-of-band mode on the Web server client machine, use the following command:

```
RREG_HOME/bin/oamreg.sh outofband input/AgentID_response.xml
```

In this example:

- Replace `RREG_HOME` with the location where you unpacked the RREG archive file on the client system.
- The `AgentID_response.xml` file, which was provided by the Oracle Access Manager server administrator, is located in the `RREG_HOME/input` directory.
- The RREG Tool saves the output from this command (the artifacts and files required to register the Webgate software) to the following directory on the client machine:

`RREG_HOME/output/`

19.5.6 Files and Artifacts Generated by RREG

The files that get generated by the RREG Tool vary, depending on the security level you are using for communications between the WebGate and the Oracle Access Manager server. For more information about the supported security levels, see *Securing Communication Between OAM Servers and WebGates* in *Administrator's Guide for Oracle Access Management*.

Note that in this topic any references to `RREG_HOME` should be replaced with the path to the directory where you ran the RREG tool. This is typically the following directory on the Oracle Access Manager server, or (if you are using out-of-band mode) the directory where you unpacked the RREG archive:

`OAM_ORACLE_HOME/oam/server/rreg/client`

The following table lists the artifacts that are always generated by the RREG Tool, regardless of the Oracle Access Manager security level.

File	Location
<code>cwallet.sso</code>	<ul style="list-style-type: none"> • <code>RREG_HOME/output/Agent_ID/</code> - For WebGate 11g (11.1.2.3). • <code>RREG_HOME/output/Agent_ID/wallet</code> - For WebGate 11g (11.1.2.2) and OHS 12c.
<code>ObAccessClient.xml</code>	<code>RREG_HOME/output/Agent_ID/</code>

The following table lists the additional files that are created if you are using the SIMPLE or CERT security level for Oracle Access Manager:

File	Location
aaa_key.pem	<i>RREG_HOME/output/Agent_ID/</i>
aaa_cert.pem	<i>RREG_HOME/output/Agent_ID/</i>
password.xml	<i>RREG_HOME/output/Agent_ID/</i>

Note that the `password.xml` file contains the obfuscated global passphrase to encrypt the private key used in SSL. This passphrase can be different than the passphrase used on the server.

You can use the files generated by RREG to generate a certificate request and get it signed by a third-party Certification Authority. To install an existing certificate, you must use the existing `aaa_cert.pem` and `aaa_chain.pem` files along with `password.xml` and `aaa_key.pem`.

19.5.7 Copying Generated Artifacts to the Oracle HTTP Server WebGate Instance Location

After the RREG Tool generates the required artifacts, manually copy the artifacts from the *RREG_Home/output/agent_ID* directory to the Oracle HTTP Server configuration directory on the Web tier host.

The location of the files in the Oracle HTTP Server configuration directory depends upon the Oracle Access Manager security mode setting (OPEN, SIMPLE, or CERT).

The following table lists the required location of each generated artifact in the Oracle HTTP Server configuration directory, based on the security mode setting for Oracle Access Manager. In some cases, you might have to create the directories if they do not exist already. For example, the wallet directory might not exist in the configuration directory.

Note:

For an enterprise deployment, Oracle recommends simple mode, unless additional requirements exist to implement custom security certificates for the encryption of authentication and authorization traffic. The information about using open or certification mode is provided here as a convenience.

Avoid using open mode, because in open mode, traffic to and from the Oracle Access Manager server is not encrypted.

For more information using certificate mode or about Oracle Access Manager supported security modes in general, see *Securing Communication Between OAM Servers and WebGates* in *Administrator's Guide for Oracle Access Management*.

File	Location When Using OPEN Mode	Location When Using SIMPLE Mode	Location When Using CERT Mode
wallet/cwallet.sso	<i>OHS_CONFIG_DIR</i> / webgate/config/ wallet	<i>OHS_CONFIG_DIR</i> / webgate/config/ wallet/	<i>OHS_CONFIG_DIR</i> / webgate/config/ wallet/

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File	Location When Using OPEN Mode	Location When Using SIMPLE Mode	Location When Using CERT Mode
			l e . C r e a t e t h e w a l l e t f o l d e r u n d e r O H S - C O N F I G - D I R / w e b g a

File	Location When Using OPEN Mode	Location When Using SIMPLE Mode	Location When Using CERT Mode
			t e / c o n f i g / .
ObAccessClient.xml	OHS_CONFIG_DIR/ webgate/config	OHS_CONFIG_DIR/ webgate/config/	OHS_CONFIG_DIR/ webgate/config/
password.xml	N/A	OHS_CONFIG_DIR/ webgate/config/	OHS_CONFIG_DIR/ webgate/config/
aaa_key.pem	N/A	OHS_CONFIG_DIR/ webgate/config/ simple/	OHS_CONFIG_DIR/ webgate/config/
aaa_cert.pem	N/A	OHS_CONFIG_DIR/ webgate/config/ simple/	OHS_CONFIG_DIR/ webgate/config/

Note: If you need to redeploy the ObAccessClient.xml to WEBHOST1 and WEBHOST2, delete the cached copy of ObAccessClient.xml from the servers. The cache location on WEBHOST1 is:

OHS_DOMAIN_HOME/servers/ohs1/cache/

And you must perform the similar step for the second Oracle HTTP Server instance on WEBHOST2:

OHS_DOMAIN_HOME/servers/ohs2/cache/

19.5.8 Restarting the Oracle HTTP Server Instance

For information about restarting the Oracle HTTP Server instance, see Restarting Oracle HTTP Server Instances by Using WLST in *Oracle Fusion Middleware Administering Oracle HTTP Server*.

If you have configured Oracle HTTP Server in a WebLogic Server domain, you can also use Oracle Fusion Middleware Control to restart the Oracle HTTP Server instances. For more information, see Restarting Oracle HTTP Server Instances by Using Fusion Middleware Control in *Oracle Fusion Middleware Administering Oracle HTTP Server*.

19.6 Setting Up the WebLogic Server Authentication Providers

To set up the WebLogic Server authentication providers, back up the configuration files, set up the Oracle Access Manager Identity Assertion Provider and set the order of providers.

The following topics assumes that you have already configured the LDAP authenticator by following the steps in [Creating a New LDAP Authenticator and Provisioning Enterprise Deployment Users and Group](#). If you have not already created the LDAP authenticator, then do so before continuing with this section.

[Backing Up Configuration Files](#)

[Setting Up the Oracle Access Manager Identity Assertion Provider](#)

[Updating the Default Authenticator and Setting the Order of Providers](#)

19.6.1 Backing Up Configuration Files

To be safe, you should first back up the relevant configuration files:

```
ASERVER_HOME/config/config.xml
ASERVER_HOME/config/fmwconfig/jps-config.xml
ASERVER_HOME/config/fmwconfig/system-jazn-data.xml
```

Also back up the `boot.properties` file for the Administration Server:

```
ASERVER_HOME/servers/AdminServer/security/boot.properties
```

19.6.2 Setting Up the Oracle Access Manager Identity Assertion Provider

Set up an Oracle Access Manager identity assertion provider in the Oracle WebLogic Server Administration Console.

To set up the Oracle Access Manager identity assertion provider:

1. Log in to the WebLogic Server Administration Console, if not already logged in.
2. Click **Lock & Edit**.
3. Click **Security Realms** in the left navigation bar.
4. Click the **myrealm** default realm entry.
5. Click the **Providers** tab.
6. Click **New**, and select the asserter type **OAMIdentityAsserter** from the drop-down menu.
7. Name the asserter (for example, *OAM ID Asserter*) and click **OK**.
8. Click the newly added asserter to see the configuration screen for the Oracle Access Manager identity assertion provider.
9. Set the control flag to *REQUIRED*.
10. Under Chosen types, select both the **ObSSOCookie** and **OAM_REMOTE_USER** options, if they are not selected by default.
11. Click **Save** to save the settings.

12. Click **Activate Changes** to propagate the changes.

19.6.3 Updating the Default Authenticator and Setting the Order of Providers

Set the order of identity assertion and authentication providers in the WebLogic Server Administration Console.

To update the default authenticator and set the order of the providers:

1. Log in to the WebLogic Server Administration Console, if not already logged in.
2. Click **Lock & Edit**.
3. From the left navigation, select **Security Realms**.
4. Click the **myrealm** default realm entry.
5. Click the **Providers** tab.
6. From the table of providers, click the **DefaultAuthenticator**.
7. Set the Control Flag to **SUFFICIENT**.
8. Click **Save** to save the settings.
9. From the navigation breadcrumbs, click **Providers** to return to the list of providers.
10. Click **Reorder**.
11. Sort the providers to ensure that the OAM Identity Assertion provider is first and the DefaultAuthenticator provider is last.

Table 19-1 Sort order

Sort Order	Provider	Control Flag
1	OAMIdentityAsserter	REQUIRED
2	LDAP Authentication Provider	SUFFICIENT
3	DefaultAuthenticator	SUFFICIENT
4	Trust Service Identity Asserter	N/A
5	DefaultIdentityAsserter	N/A

12. Click **OK**.
13. Click **Activate Changes** to propagate the changes.
14. Restart the Administration Server, Managed Servers, and any system components, as applicable.

19.7 Configuring Oracle ADF and OPSS Security with Oracle Access Manager

Some Oracle Fusion Middleware management consoles use Oracle Application Development Framework (Oracle ADF) security, which can integrate with Oracle

Access Manager Single Sign On (SSO). These applications can take advantage of Oracle Platform Security Services (OPSS) SSO for user authentication, but you must first configure the domain-level `jps-config.xml` file to enable these capabilities.

The domain-level `jps-config.xml` file is located in the following location after you create an Oracle Fusion Middleware domain:

`DOMAIN_HOME/config/fmwconfig/jps-config.xml`

Note:

The domain-level `jps-config.xml` should not be confused with the `jps-config.xml` that is deployed with custom applications.

To update the OPSS configuration to delegate SSO actions in Oracle Access Manager, complete the following steps:

1. Change to the following directory:

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

2. Start the WebLogic Server Scripting Tool (WLST):

```
./wlst.sh
```

3. Connect to the Administration Server, using the following WLST command:

```
connect('admin_user','admin_password','admin_url')
```

For example:

```
connect('weblogic_wcc','mypassword','t3://ADMINVHN:7001')
```

4. Execute the `addOAMSSOProvider` command, as follows:

```
addOAMSSOProvider(loginuri="/${app.context}/adfAuthentication", logouturi="/oamssso/logout.html")
```

The following table defines the expected value for each argument in the `addOAMSSOProvider` command.

Argument	Definition
loginuri	Specifies the URI of the login page
	<hr/> <p>Note: For ADF security enabled applications, <code>"/context-root/adfAuthentication"</code> should be provided for the 'loginuri' parameter.</p> <hr/>
	<p>For example:</p> <pre>/\${app.context}/adfAuthentication</pre>
	<hr/> <p>Note: <code>/\${app.context}</code> must be entered as shown. At runtime, the application replaces the variable appropriately.</p> <hr/>
	<p>Here is the flow:</p> <ol style="list-style-type: none"> a. User accesses a resource that has been protected by authorization policies in OPSS, for example. b. If the user is not yet authenticated, ADF redirects the user to the URI configured in 'loginuri'. c. Access Manager should have a policy to protect the value in 'loginuri': for example, <code>"/context-root/adfAuthentication"</code>. d. When ADF redirects to this URI, Access Manager displays a Login Page (depending on the authentication scheme configured in Access Manager for this URI).
logouturi	<p>Specifies the URI of the logout page</p> <p>Notes:</p> <ul style="list-style-type: none"> • For ADF security enabled applications, <code>logouturi</code> should be configured based on logout guidelines in <i>Configuring Centralized Logout for Sessions Involving 11g WebGates in Administrator's Guide for Oracle Access Management</i>. • When using WebGate 11g, the value of the <code>logouturi</code> should be sought from the 11g WebGate Administrator. • When using WebGate 10g, the value of <code>logouturi</code> should be <code>/oamssso/logout.html</code>.
autologinuri	<p>Specifies the URI of the autologin page. This is an optional parameter.</p>

5. Disconnect from the Administration Server:

```
disconnect()
```

6. Restart the Administration Server and all the Managed Servers.

Using Multi Data Sources with Oracle RAC

Oracle recommends using GridLink data sources when developing new Oracle RAC applications. However, if you are using legacy applications and databases that do not support GridLink data sources, refer to the information in this appendix.

This appendix provides information about multi data sources and Oracle RAC and procedure for configuring multi data sources for an Enterprise Deployment.

About Multi Data Sources and Oracle RAC

A multi data source provides an ordered list of data sources to use to satisfy connection requests.

Typical Procedure for Configuring Multi Data Sources for an Enterprise Deployment

You need to configure data sources when you configure a domain. If you want to use Multi Data Sources instead of GridLink data sources, replace the GridLink instructions with the instructions provided in this section.

A.1 About Multi Data Sources and Oracle RAC

A multi data source provides an ordered list of data sources to use to satisfy connection requests.

Normally, every connection request to this kind of multi data source is served by the first data source in the list. If a database connection test fails and the connection cannot be replaced, or if the data source is suspended, a connection is sought sequentially from the next data source on the list.

For more information about configuring Multi Data Sources with Oracle RAC, see *Using Multi Data Sources with Oracle RAC in Oracle Fusion Middleware Administering JDBC Data Sources for Oracle WebLogic Server*.

A.2 Typical Procedure for Configuring Multi Data Sources for an Enterprise Deployment

You need to configure data sources when you configure a domain. If you want to use Multi Data Sources instead of GridLink data sources, replace the GridLink instructions with the instructions provided in this section.

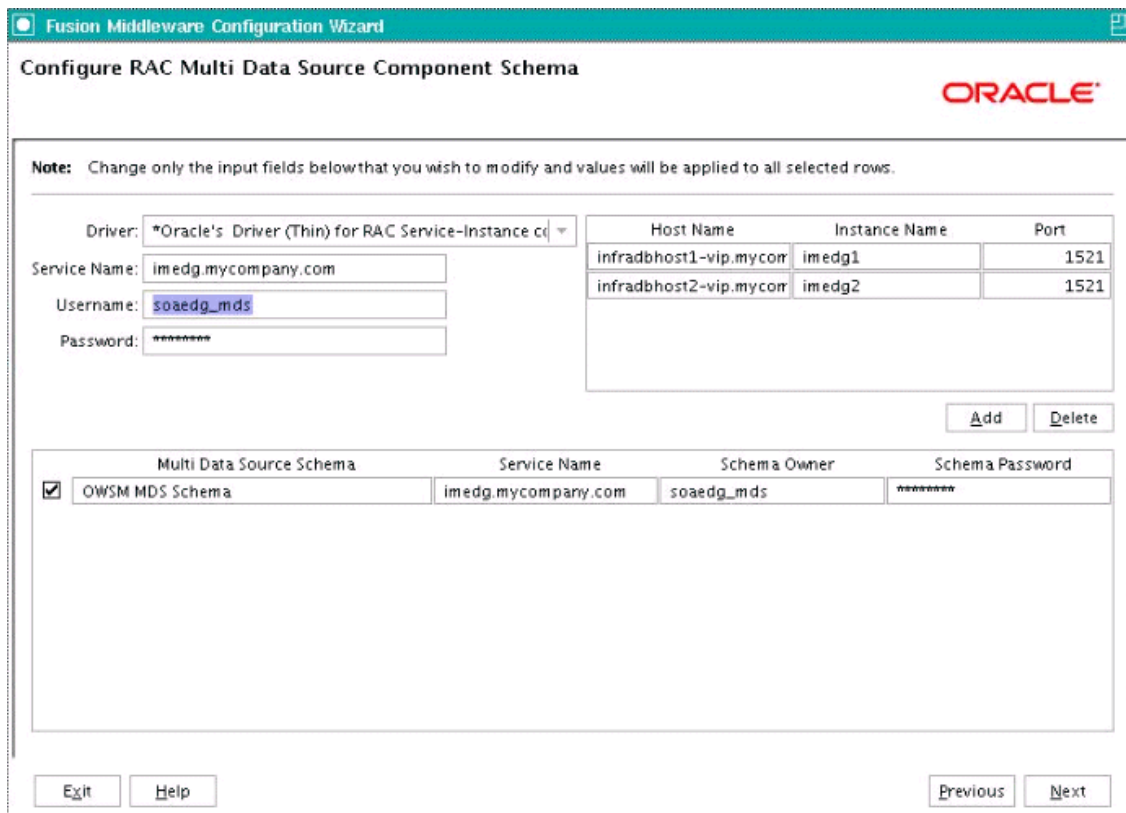
For example, when you are configuring the initial Administration domain for an Enterprise Deployment reference topology, you use the configuration wizard to define the characteristics of the domain, as well as the data sources.

The procedures for configuring the topologies in this Enterprise Deployment Guide include specific instructions for defining GridLink data sources with Oracle RAC. If you want to use Multi Data Sources instead of GridLink data sources, replace the GridLink instructions with the following:

1. In the Configure JDBC Component Schema screen:

- a. Select the appropriate schemas.
 - b. For the RAC configuration for component schemas, **Convert to RAC multi data source**.
 - c. Ensure that the following data source appears on the screen with the schema prefix when you ran the Repository Creation Utility.
 - d. Click **Next**.
2. The Configure RAC Multi Data Sources Component Schema screen appears (Figure A-1).

Figure A-1 Configure RAC Multi Data Source Component Schema Screen



In this screen, do the following:

- a. Enter values for the following fields, specifying the connect information for the Oracle RAC database that was seeded with RCU.
 - **Driver:** Select **Oracle driver (Thin) for RAC Service-Instance connections, Versions:10, 11**.
 - **Service Name:** Enter the service name of the database.
 - **Username:** Enter the complete user name (including the prefix) for the schemas.
 - **Password:** Enter the password to use to access the schemas.
- b. Enter the host name, instance name, and port.

- c. Click **Add**.
 - d. Repeat this for each Oracle RAC instance.
 - e. Click **Next**.
3. In the Test JDBC Data Sources screen, the connections are tested automatically. The **Status** column displays the results. Ensure that all connections were successful. If not, click **Previous** to return to the previous screen and correct your entries.

Click **Next** when all the connections are successful.

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