Oracle® Fusion Middleware

Enterprise Deployment Guide for Oracle WebCenter

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Oracle Fusion Middleware Enterprise Deployment Guide for Oracle WebCenter, 11*g* Release 1 (11.1.1)

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Preface

This preface describes the audience, contents and conventions used in the *Oracle Fusion Middleware Enterprise Deployment Guide for WebCenter*.

Audience

This guide is intended for system administrators who are responsible for installing and configuring Oracle Fusion Middleware enterprise deployments.

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Related Documents

The following manuals in the Oracle Fusion Middleware documentation library provide additional information on the process of installing and configuring the Enterprise Deployment architectures:

- *Oracle Fusion Middleware Administrator's Guide*
- *Oracle Fusion Middleware Administrator's Guide for Oracle Virtual Directory*
- *Oracle Fusion Middleware Administrator's Guide for Oracle Internet Directory*

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

1 Enterprise Deployment Overview

This chapter provides an overview of the enterprise topology for Oracle WebCenter. It contains the following sections:

1.1 What is an Enterprise Deployment?

An enterprise deployment is an Oracle best practices blueprint based on proven Oracle high-availability and security technologies and recommendations for Oracle Fusion Middleware. The best practices described in these blueprints span many Oracle products across the entire technology stack: Oracle Database, Oracle Fusion Middleware, and Enterprise Manager Fusion Middleware Control.

An Oracle Fusion Middleware enterprise deployment:

- considers various business service level agreements (SLA) to make high-availability best practices as widely applicable as possible
- leverages database grid servers and storage grid with low-cost storage to provide highly resilient, lower cost infrastructure
- uses results from extensive performance impact studies for different configurations to ensure that the high-availability architecture is optimally configured to perform and scale to business needs
- enables control over the length of time to recover from an outage and the amount of acceptable data loss from a natural disaster
- uses Oracle best practices and recommended architecture, which are independent of hardware and operating systems.

For more information on high availability practices, go to `http://www.oracle.com/technology/deploy/availability/htdocs/maa.htm`.

Note: This document focuses on enterprise deployments in Linux environments, but enterprise deployments can also be implemented in UNIX and Windows environments.

1.2 Terminology

This section identifies terms used to describe components in prior releases, and the terms to which they correlate in 11*g* Release 1 (11.1.1).

- **Oracle home**: An Oracle home contains installed files necessary to host a specific product. For example, the SOA Oracle home contains a directory that contains binary and library files for Oracle SOA Suite. An Oracle home resides within the directory structure of the Middleware home. Each Oracle home can be associated with multiple Oracle instances or Oracle WebLogic Server domains.
- **Oracle Common Home**: This environment variable and related directory path refers to the Oracle home that contains the binary and library files required for the Oracle Enterprise Manager Fusion Middleware Control and Java Required Files (JRF).
- **WebLogic Server home**: A WebLogic Server home contains installed files necessary to host a WebLogic Server. The WebLogic Server home directory is a peer of Oracle home directories and resides within the directory structure of the Middleware home.
- **Middleware home:** A Middleware home consists of the Oracle WebLogic Server home, and, optionally, one or more Oracle homes. A Middleware home can reside on a local file system or on a remote shared disk that is accessible through NFS.
- **Oracle instance**: An Oracle instance contains one or more active middleware system components, for example Oracle Web Cache, Oracle HTTP Server, or Oracle Internet Directory. You determine which components are part of an instance, either at install time or by creating and configuring an instance at a later time. An Oracle instance contains files that can be updated, such as configuration files, log files, temporary files.
- **failover**: When a member of a high availability system fails unexpectedly (unplanned downtime), in order to continue offering services to its consumers, the system undergoes a failover operation. If the system is an active-passive system, the passive member is activated during the failover operation and consumers are directed to it instead of the failed member. The failover process can be performed manually, or it can be automated by setting up hardware cluster services to detect failures and move cluster resources from the failed node to the standby node. If the system is an active-active system, the failover is performed by the load balancer entity serving requests to the active members. If an active member fails, the load balancer detects the failure and automatically redirects requests for the failed member to the surviving active members. See *Oracle Fusion Middleware High Availability Guide* for information on active-active and active-passive systems.
- **failback**: After a system undergoes a successful failover operation, the original failed member can be repaired over time and be re-introduced into the system as a standby member. If desired, a failback process can be initiated to activate this member and deactivate the other. This process reverts the system back to its pre-failure configuration.
- **hardware cluster**: A hardware cluster is a collection of computers that provides a single view of network services (for example: an IP address) or application services (for example: databases, Web servers) to clients of these services. Each

node in a hardware cluster is a standalone server that runs its own processes. These processes can communicate with one another to form what looks like a single system that cooperatively provides applications, system resources, and data to users.

A hardware cluster achieves high availability and scalability through the use of specialized hardware (cluster interconnect, shared storage) and software (health monitors, resource monitors). (The cluster interconnect is a private link used by the hardware cluster for heartbeat information to detect node death.) Due to the need for specialized hardware and software, hardware clusters are commonly provided by hardware vendors such as Sun, HP, IBM, and Dell. While the number of nodes that can be configured in a hardware cluster is vendor dependent, for the purpose of Oracle Fusion Middleware high availability, only two nodes are required. Hence, this document assumes a two-node hardware cluster for high availability solutions employing a hardware cluster.

- **cluster agent**: The software that runs on a node member of a hardware cluster that coordinates availability and performance operations with other nodes. Clusterware provides resource grouping, monitoring, and the ability to move services. A cluster agent can automate the service failover.
- **clusterware**: A software that manages the operations of the members of a cluster as a system. It allows one to define a set of resources and services to monitor via a heartbeat mechanism between cluster members and to move these resources and services to a different member in the cluster as efficiently and transparently as possible.
- **shared storage**: Shared storage is the storage subsystem that is accessible by all the machines in the enterprise deployment domain. Among other things, the following is located on the shared disk:
  - Middleware Home software
  - AdminServer Domain Home
  - JMS
  - Tlogs (where applicable)

  Managed Server homes can also be optionally located in the shared disk. The shared storage can be a Network Attached Storage (NAS), a Storage Area Network (SAN) or any other storage system that multiple nodes can access simultaneously and can read-write.
- **primary node**: The node that is actively running an Oracle Fusion Middleware instance at any given time and has been configured to have a backup/secondary node. If the primary node fails, Oracle Fusion Middleware instance is failed over to the secondary node. This failover can be manual or automated using the Clusterware for Administration Server. For a server migration based scenario, WebLogic Whole Server Migration is used for automated failover.
- **secondary node**: The node that is the backup node for an Oracle Fusion Middleware instance. This is where the active instance fails over when the primary node is no longer available. See the definition for primary node in this section.
- **network host name**: Network host name is a name assigned to an IP address either through the `/etc/hosts` file or through DNS resolution. This name is visible in the network that the machine to which it refers to is connected. Often, the network host name and physical host name are identical. However, each machine has only one physical host name but may have multiple network host

names. Thus, a machine's network host name may not always be its physical host name.

- **physical host name**: This guide differentiates between the terms physical host name and network host name. This guide uses physical host name to refer to the "internal name" of the current machine. On UNIX, this is the name returned by the `hostname` command.

  Physical host name is used by Oracle Fusion Middleware to reference the local host. During installation, the installer automatically retrieves the physical host name from the current machine and stores it in the Oracle Fusion Middleware configuration metadata on disk.

- **physical IP**: Physical IP refers to the IP of a machine on the network. In almost all cases, it is normally associated with the physical host name of the machine (see the definition of the physical host name). In contrast to a virtual IP, it is always associated with the same machine when on a network.

- **switchover**: During normal operation, active members of a system may require maintenance or upgrading. A switchover process can be initiated to allow a substitute member to take over the workload performed by the member that requires maintenance or upgrading, which undergoes planned downtime. The switchover operation ensures continued service to consumers of the system.

- **switchback**: When a switchover operation is performed, a member of the system is deactivated for maintenance or upgrading. When the maintenance or upgrading is completed, the system can undergo a switchback operation to activate the upgraded member and bring the system back to the pre-switchover configuration.

- **virtual host name**: Virtual host name is a network addressable host name that maps to one or more physical machines via a load balancer or a hardware cluster. For load balancers, the name "virtual server name" is used interchangeably with virtual host name in this book. A load balancer can hold a virtual host name on behalf of a set of servers, and clients communicate indirectly with the machines using the virtual host name. A virtual host name in a hardware cluster is a network host name assigned to a cluster virtual IP. Because the cluster virtual IP is not permanently attached to any particular node of a cluster, the virtual host name is not permanently attached to any particular node either.

  Note: Whenever the term "virtual host name" is used in this document, it is assumed to be associated with a virtual IP address. In cases where just the IP address is needed or used, it will be explicitly stated.

- **virtual IP**: Also, cluster virtual IP and load balancer virtual IP. Generally, a virtual IP can be assigned to a hardware cluster or load balancer. To present a single system view of a cluster to network clients, a virtual IP serves as an entry point IP address to the group of servers which are members of the cluster. A virtual IP can be assigned to a server load balancer or a hardware cluster.

  A hardware cluster uses a cluster virtual IP to present to the outside world the entry point into the cluster (it can also be set up on a standalone machine). The hardware cluster's software manages the movement of this IP address between the two physical nodes of the cluster while clients connect to this IP address without the need to know which physical node this IP address is currently active on. In a typical two-node hardware cluster configuration, each machine has its own physical IP address and physical host name, while there could be several cluster IP

addresses. These cluster IP addresses float or migrate between the two nodes. The node with current ownership of a cluster IP address is active for that address.

A load balancer also uses a virtual IP as the entry point to a set of servers. These servers tend to be active at the same time. This virtual IP address is not assigned to any individual server but to the load balancer which acts as a proxy between servers and their clients.

1.3 Benefits of Oracle Recommendations

The Oracle Fusion Middleware configurations discussed in this guide are designed to ensure security of all invocations, maximize hardware resources, and provide a reliable, standards-compliant system for enterprise computing with a variety of applications.

- Section 1.3.1, "Built-in Security"
- Section 1.3.2, "High Availability"

The security and high availability benefits of the Oracle Fusion Middleware configurations are realized through isolation in firewall zones and replication of software components.

1.3.1 Built-in Security

The Enterprise Deployment architectures are secure because every functional group of software components is isolated in its own DMZ, and all traffic is restricted by protocol and port. The following characteristics ensure security at all needed levels, as well as a high level of standards compliance:

- Configure external load balancers to redirect all external communication received on port 80 to port 443.

  Note: The Oracle Technology Network (`http://www.oracle.com/technology/index.html`) provides a list of validated load balancers and their configuration at `http://www.oracle.com/technology/products/ias/hi_av/Tested_LBR_FW_SSLAccel.html`.

- Communication from external clients does not go beyond the Load Balancing Router level.
- No direct communication from the Load Balancing Router to the data tier is allowed.
- Components are separated in different protection zones: the Web tier, application tier, and the data tier.
- Direct communication across two firewalls at any one time is prohibited.
- If a communication begins in one firewall zone, it must end in the next firewall zone.
- Oracle Internet Directory is isolated in the data tier.
- Identity Management components are in a separate subnet.
- All communication between components across protection zones is restricted by port and protocol, according to firewall rules.

1.3.2 High Availability

The enterprise deployment architectures are highly available, because each component or functional group of software components is replicated on a different computer, and configured for component-level high availability.

1.4 Hardware Requirements

Typical hardware requirements for the Enterprise Deployment on Linux operating systems are listed in Table 1–1. The memory figures represent the memory required to install and run an Oracle Fusion Middleware server; however, for most production sites, you should configure at least 4 GB of physical memory.

For detailed requirements, or for requirements for other platforms, see the Oracle Fusion Middleware Installation Guide for that platform.

Table 1–1 Typical Hardware Requirements

Server	Processor	Disk	Memory	TMP Directory	Swap
Database	4 or more X Pentium, 1.5 GHz or greater	nXm n = number of disks, at least 4 (striped as one disk) m = size of the disk (minimum of 30 GB)	6-8 GB	Default	Default
WEBHOST*n*	2 or more X Pentium, 1.5 GHz or greater	10 GB	4 GB	Default	Default
SOAHOST*n*	2 or more X Pentium, 1.5 GHz or greater	10 GB[1]	4 GB	Default	Default
WCHOST*n*	2 or more X Pentium, 1.5 GHz or greater	10 GB	4 GB	Default	Default

[1] For a shared storage Middleware home configuration, two installations suffice by making a total of 20 GB independently of the number of slots.

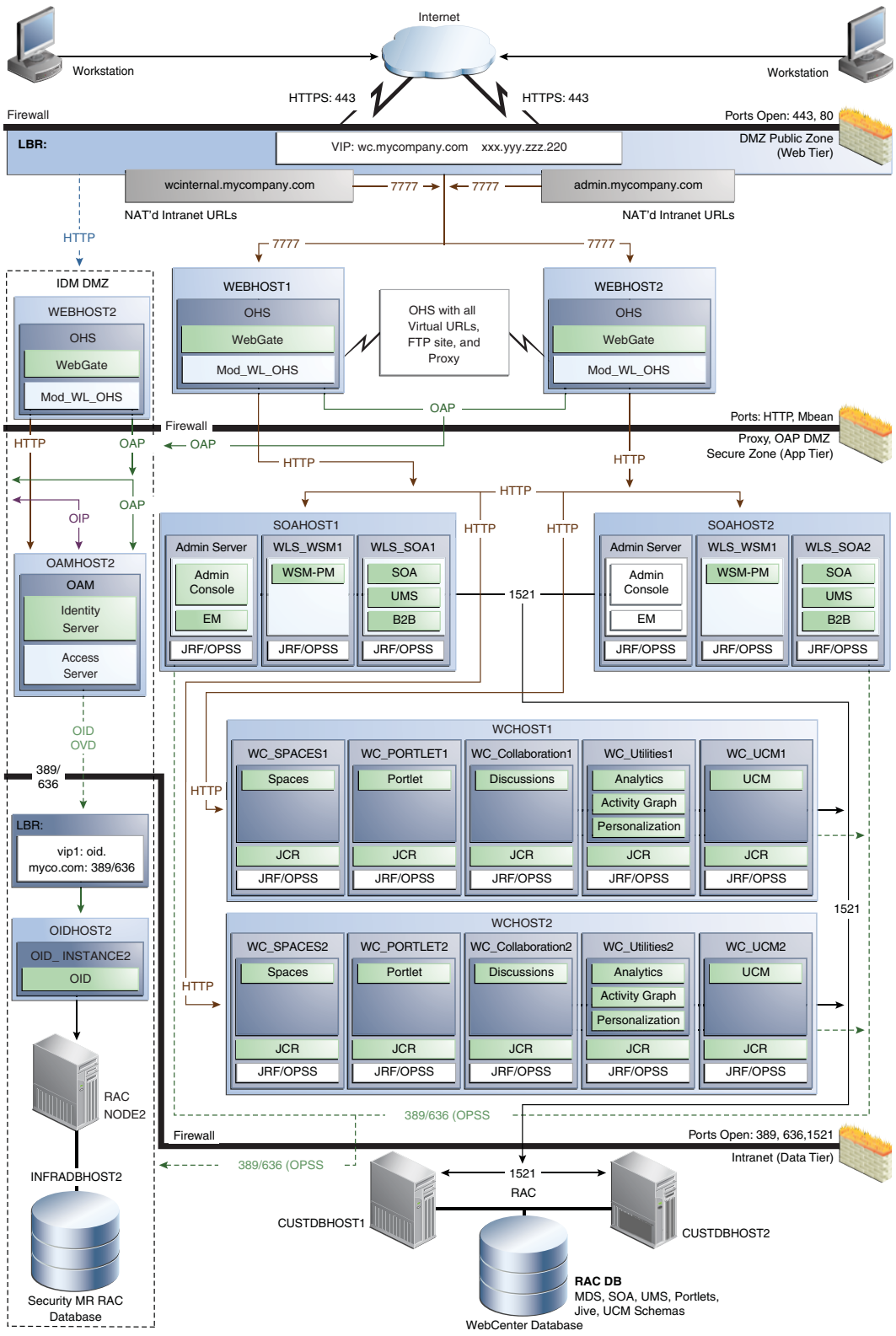
Note: You must perform the appropriate capacity planning to determine the number of nodes, CPU, and memory requirements for each node depending on the specific system's load as well as the throughput and response requirements. These will vary for each application or custom SOA system being used.

1.5 Enterprise Deployment Reference Topology

The instructions and diagrams in this guide describe a reference topology, to which variations may be applied.

This guide provides configuration instructions for a reference enterprise topology that uses Oracle WebCenter with Oracle Access Manager, as shown in Figure 1–1.

Figure 1–1 MyWCCompany Topology with Oracle Access Manager



This section covers these topics:

1.5.1 Oracle Identity Management

Integration with the Oracle Identity Management system is an important aspect of the enterprise deployment architecture. This integration provides features such as single sign-on, integration with Oracle Platform Security Services, centralized identity and credential store, authentication for the WebLogic domain, and so on. The Oracle Identity Management enterprise deployment is separate from this enterprise deployment and exists in a separate domain by itself. For more information on Oracle Identity Management in an enterprise deployment context, see *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*.

The primary interface to the Oracle Identity Management enterprise deployment is the LDAP traffic to the LDAP servers, the OAP (Oracle Access Protocol) to the OAM Access Servers, and the HTTP redirection of authentication requests.

1.5.2 Web Tier

Nodes in the web tier are located in the DMZ public zone.

In this tier, two nodes WEBHOST1 and WEBHOST2 run Oracle HTTP Server configured with WebGate and mod_wl_ohs.

Through mod_wl_ohs, which allows requests to be proxied from Oracle HTTP Server to WebLogic Server, Oracle HTTP Server forwards the requests to WebLogic Server running in the application tier.

WebGate (which is an Oracle Access Manager component) in Oracle HTTP Server uses Oracle Access Protocol (OAP) to communicate with Oracle Access Manager running on OAMHOST2, in the Identity Management DMZ. WebGate and Oracle Access Manager are used to perform operations such as user authentication.

The web tier also includes a load balancer router to handle external requests. External requests are sent to the virtual host names configured on the load balancer. The load balancer then forwards the requests to Oracle HTTP Server.

The WebGate module in Oracle HTTP Server uses Oracle Access Protocol (OAP) to communicate with Oracle Access Manager to perform operations such as querying user groups.

On the firewall protecting the web tier, only the HTTP ports are open: 443 for HTTPS and 80 for HTTP.

1.5.2.1 Load Balancer Requirements

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). Typically, this feature is called SSL acceleration and it is required for this Enterprise Deployment.

1.5.3 Application Tier

Nodes in the application tier are located in the DMZ secure zone.

SOAHOST1 and SOAHOST2 run the Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control, but in an active-passive configuration. You can fail over the Administration Server manually (see Section 4.22, "Manually Failing Over the Administration Server to SOAHOST2"); alternatively you can configure the Oracle WebLogic Server Administration Console with CFC/CRS to fail over automatically on a separate hardware cluster (not shown in this architecture).

Oracle WebCenter components such as WebCenter Spaces, Portlets, Oracle WebCenter Discussions, and WebCenter Portal applications run on WCHOST1 and WCHOST2 in an active-active configuration. Typically the managed servers are called WC_Spaces, WC_Portlet, WC_Collaboration (for Discussions), and WC_Utilities (for Analytics, Activity Graph, Personalization. You can also create a managed server to run WebCenter Portal applications.

WCHOST1 and WCHOST2 also run Oracle Content Server (OCS). OCS is configured in an active-active manner.

If you are also running SOA components in this topology, SOAHOST1 and SOAHOST2 run WebLogic Server configured with the WLS_SOA and WLS_WSM managed servers, which run SOA components. These components are configured in an active-active manner.

Oracle Web Services Manager (Oracle WSM) provides a policy framework to manage and secure Web services in the Enterprise Deployment topology. WSM Policy Manager also runs in active-active configuration in two additional WebLogic Servers.

On the firewall protecting the application tier, the HTTP ports, OAP port, and proxy port are open. The OAP port is for the WebGate module running in Oracle HTTP Server in the web tier to communicate with Oracle Access Manager. Applications requiring external HTTP access use Oracle HTTP Server as the proxy. (The proxy on the Oracle HTTP Server must be enabled to allow this access.)

1.5.4 Data Tier

Nodes in the data tier are located in the most secured network zone (the intranet).

In this tier, an RAC database runs on the nodes CUSTDBHOST1 and CUSTDBHOST2. The database contains the schemas needed by the SOA Oracle WebCenter components. The WebCenter and SOA components running in the application tier access this database.

On the firewall protecting the data tier, the database listener port (typically, 1521) is required to be open. The LDAP ports (typically, 389 and 636) are also required to be open for the traffic accessing the LDAP storage in the IDM Enterprise Deployment.

1.5.5 What to Install

Table 1–2 identifies the source for installation of each software component. For more information, see *Oracle Fusion Middleware Installation Guide for Oracle SOA Suite* and *Oracle Fusion Middleware Installation Guide for Oracle WebCenter*.

Table 1–2 Components and Installation Sources

Component	Distribution Medium
Oracle Database 10*g* or 11*g*	Oracle Database CD (in 10*g* series, 10.2.0.4 or higher; in 11*g* series, 11.1.0.7 or higher)
Repository Creation Utility (RCU)	Oracle Fusion Middleware Repository Creation Utility 11*g* (11.1.1.4.0) DVD
Oracle WebLogic Server (WLS)	Oracle Weblogic Server 11g R1 (10.3.3) DVD
Oracle HTTP Server	Oracle Fusion Middleware WebTier and Utilities 11*g* (11.1.1.4.0) DVD
Oracle SOA Suite	Oracle SOA Suite 11g (11.1.1.4.0) DVD
Oracle Business Activity Monitor (BAM)	Oracle Fusion Middleware 11*g* (11.1.1.4.0) DVD
Oracle Access Manager 10*g* Webgate	Oracle Access Manager 10*g* Webgates (10.1.4.3.0) DVD ; OAM OHS 11*g* webgates per platform
Oracle Virtual Directory (OVD)	Oracle Identity Management 11*g* (11.1.1.4.0) DVD

1.5.6 Unicast Requirement

Oracle recommends that the nodes in the myWCCompany topology communicate using unicast. 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.

The following considerations apply when using unicast to handle cluster communications:

- All members of a WebLogic cluster must use the same message type. Mixing between multicast and unicast messaging is not allowed.
- Individual cluster members cannot override the cluster messaging type.
- The entire cluster must be shut down and restarted to change the message modes (from unicast to multicast or from multicast to unicast).
- JMS topics configured for multicasting can access WebLogic clusters configured for unicast because a JMS topic publishes messages on its own multicast address that is independent of the cluster address. However, the following considerations apply:
  - The router hardware configurations that allow unicast clusters may not allow JMS multicast subscribers to work.
  - JMS multicast subscribers need to be in a network hardware configuration that allows multicast accessibility. (That is, JMS subscribers must be in a muticast-enabled network to access multicast topics.)

1.6 How to Use This Guide

This section covers the following topics:

- Section 1.6.1, "Installation and Configuration Procedure"
- Section 1.6.2, "Overview of Installation Strategies"

1.6.1 Installation and Configuration Procedure

Table 1–3 summarizes the process by which you install and configure WebCenter. Follow the procedures indicated in the first column, in the order shown, for the chosen configuration.

> **Note:** This document focuses on enterprise deployments in Linux environments, but enterprise deployments can also be implemented in UNIX and Windows environments.

Table 1–3 WebCenter Installation Procedures

Perform the steps in...	To configure a domain with only Admin Server and WSM-PM	To configure a domain with Admin Server, WSM-PM, and to extend a domain with a SOA cluster	To configure a domain with Admin Server, WCM-PM, SOA cluster, and WebCenter
Chapter 2, "Database and Environment Preconfiguration"	Yes	Yes	Yes
Chapter 3, "Installing Oracle HTTP Server"	Yes	Yes	Yes
Chapter 4, "Creating a Domain"	Yes	Yes	Yes
Chapter 5, "Extending the Domain for SOA Components"	No	Yes	Yes
Chapter 6, "Extending the Domain for WebCenter Components"	No	No	Yes

Table 1–3 (Cont.) WebCenter Installation Procedures

Perform the steps in...	To configure a domain with only Admin Server and WSM-PM	To configure a domain with Admin Server, WSM-PM, and to extend a domain with a SOA cluster	To configure a domain with Admin Server, WCM-PM, SOA cluster, and WebCenter
Chapter 7, "Setting Up Node Manager"	Recommended (optional depending on the type of security required for the application tier)	Recommended (optional depending on the type of security required for the application tier)	Recommended (optional depending on the type of security required for the application tier)
Chapter 8, "Configuring External Services"	No	No	Yes
Chapter 9, "Installing and Configuring Oracle Universal Content Management"	No	No	Yes

1.6.2 Overview of Installation Strategies

With the Configuration Wizard you can extend the Oracle WebLogic domain by adding only the needed components. You do not need to use the Configuration Wizard to create SOA components and the Oracle WebCenter components along with the domain that includes the Administration Server, Enterprise Manager, and WSM-PM in a single pass. You can instead create the domain and its Administration Server, Enterprise Manager, and WSM-PM in one pass, and then extend the domain by adding only the SOA components (or if needed, only the WebCenter components) in a subsequent pass. Using this incremental approach, you can verify the installation of the servers and perform specific validations after each pass of the Configuration Wizard. In general, Oracle recommends the following approach:

1. Run a first pass of the Configuration Wizard to install the Administration Server, Enterprise Manager, and WSM-PM (described in Chapter 4, "Creating a Domain").
2. Optionally, run a second pass of the Configuration Wizard to install the SOA components (described in Chapter 5, "Extending the Domain for SOA Components").
3. Run a third pass to install the WebCenter components (described in Chapter 6, "Extending the Domain for WebCenter Components").

Oracle recommends this modular approach in order to facilitate the verification of individual components one by one. This building block approach simplifies the troubleshooting during the setup process and facilitates the configuration in smaller steps.

Some variation from the above topology is possible. For example, if a deployment chooses to install WebCenter alone, then only sections applicable extend with WebCenter need to be followed. Also, in this case, it is expected that the Admin Server will exist on WCHOST1 instead and the instructions on creating the domain should be modified appropriately.

2

Database and Environment Preconfiguration

This chapter describes database and network environment preconfiguration required by the WebCenter enterprise topology. This chapter contains the following sections:

- Section 2.1, "Database"
- Section 2.2, "Network"
- Section 2.3, "Shared Storage and Recommended Directory Structure"
- Section 2.4, "LDAP as Credential and Policy Store"

2.1 Database

For the WebCenter enterprise topology, the database contains the Oracle Fusion Middleware Repository, which is a collection of schemas used by various Oracle Fusion Middleware components, such as the WebCenter components, and OWSM. This database is separate from the Identity Management database, which is used in Identity Management Enterprise Deployment by components such as Oracle Internet Directory, DIP, and so on.

You must install the Oracle Fusion Middleware Repository before you can configure the Oracle Fusion Middleware components. You install the Oracle Fusion Middleware metadata repository into an existing database using the Repository Creation Utility (RCU), which is available from the RCU DVD or from the location listed in Table 1–2. For the enterprise topology, a Real Application Clusters (RAC) database is highly recommended.

When you configure the WebCenter components, the configuration wizard will prompt you to enter the information for connecting to the database that contains the metadata repository.

This section covers the following topics:

- Section 2.1.1, "Setting Up the Database"
- Section 2.1.2, "Loading the Oracle Fusion Metadata Repository in the Oracle RAC Database"
- Section 2.1.4, "Backing Up the Database"

2.1.1 Setting Up the Database

Before loading the metadata repository into your database, check that the database meets the requirements described in these subsections:

- Section 2.1.1.1, "Database Host Requirements"

- Section 2.1.1.2, "Supported Database Versions"
- Section 2.1.1.3, "Initialization Parameters"
- Section 2.1.1.4, "Database Services"

2.1.1.1 Database Host Requirements

On the hosts CUSTDBHOST1 and CUSTDBHOST2 in the data tier, note the following requirements:

- **Oracle Clusterware**

  For 11*g* Release 1 (11.1) for Linux, refer to the *Oracle Clusterware Installation Guide for Linux*.

- **Oracle Real Application Clusters**

  For 11*g* Release 1 (11.1) for Linux, refer to the *Oracle Real Application Clusters Installation Guide for Linux.* For 10*g* Release 2 (10.2) for Linux, refer to *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide*.

- **Automatic Storage Management** (optional)

  ASM gets installed for the node as a whole. It is recommended that you install it in a separate Oracle Home from the Database Oracle Home. This option comes in at runInstaller. In the Select Configuration page, select the Configure Automatic Storage Management option to create a separate ASM home.

2.1.1.2 Supported Database Versions

Oracle SOA Suite requires the presence of a supported database and schemas:

- To check if your database is certified or to see all certified databases, refer to the "Certified Databases" section in the Certification Document:

  `http://www.oracle.com/technology/software/products/ias/files/fusion_certification.html`

To check the release of your database, you can query the `PRODUCT_COMPONENT_VERSION` view as follows:

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

> **Note:** Oracle SOA Suite requires the database be used to store its metadata (either 10*g* or 11*g*) supports the **AL32UTF8** character set. Check the database documentation for information on choosing a character set for the database.

2.1.1.3 Initialization Parameters

Ensure that the following initialization parameter is set to the required minimum value. It is checked by Repository Creation Assistant.

Table 2–1 Required Initialization Parameters

Configuration	Parameter	Required Value	Parameter Class
SOA	`PROCESSES`	300 or greater	Static
WC	`PROCESSES`	300 or greater	Static

Table 2–1 (Cont.) Required Initialization Parameters

Configuration	Parameter	Required Value	Parameter Class
SOA and WC	PROCESSES	600 or greater	Static

To check the value of the initialization parameter using SQL*Plus, you can use the SHOW PARAMETER command.

As the SYS user, issue the SHOW PARAMETER command as follows:

```
SQL> SHOW PARAMETER processes
```

Set the initialization parameter using the following command:

```
SQL> ALTER SYSTEM SET processes=300 SCOPE=SPFILE;
```

Restart the database.

> **Note:** The method that you use to change a parameter's value depends on whether the parameter is static or dynamic, and on whether your database uses a parameter file or a server parameter file. See the *Oracle Database Administrator's Guide* for details on parameter files, server parameter files, and how to change parameter values.

2.1.1.4 Database Services

Oracle recommends using the Oracle Enterprise Manager Cluster Managed Services Page to create database services that client applications will use to connect to the database. For complete instructions on creating database services, see the chapter on workload management in the *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Administration and Deployment* Guide.

You can also use SQL*Plus to configure this using the following instructions:

1. Use the CREATE_SERVICE subprogram to create the `wcedg.mycompany.com` database service. Log on to SQL*Plus as the sysdba user and run the following command:

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

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

   ```
   prompt> srvctl add service -d wcdb -s wcedg -r wcdb1,wcdb2
   ```

3. Start the service using `srvctl`:

   ```
   prompt> srvctl start service -d wcdb -s wcedg
   ```

> **Note:** For more information about the SRVCTL command, see the *Oracle Real Application Clusters Administration and Deployment Guide*.

Oracle recommends that a specific database service be used for a product suite even when they share the same database. It is also recommended that the database service used is different than the default database service. In this case, the database is *wcdb.mycompany.com* and the default service is one with the same name. The

WebCenter install is configured to use the service *wcedg.mycompany.com*. It is recommended that a service named *soaedg.mycompany.com* is used for SOA.

2.1.2 Loading the Oracle Fusion Metadata Repository in the Oracle RAC Database

To load the Oracle Fusion Middleware Repository into a database, complete these steps:

1. Start Repository Creation Utility (RCU), which is available from the RCU DVD or from the location listed in Table 1–2, by first inserting the RCU DVD.
2. Start RCU from the *bin* directory:

   ./rcu
3. In the Welcome screen, click **Next**.
4. In the Create Repository screen, select **Create** to load component schemas into a database. Click **Next**.
5. In the Database Connection Details screen, enter connect information for your database:
   - **Database Type**: select **Oracle Database**.
   - **Host Name**: Enter the name of the node that is running the database. For the Oracle RAC database, specify the VIP name or one of the node names as the host name: `CUSTDBHOST1-VIP`.
   - **Port**: Enter the port number for the database: 1521.
   - **Service Name**: Enter the service name of the database:wcedg.mycompany.com
   - **Username**: `SYS`
   - **Password**: Enter the password for the SYS user.
   - **Role**: `SYSDBA`

   Click **Next**.
6. If you get this warning message: The database you are connecting is with non-UTF8 charset, if you are going to use this database for multilingual support, you may have data loss. If you are not using for multilingual support you can continue, otherwise we strongly recommend using UTF-8 database.

   Click **Ignore** or **Stop**.
7. In the Select Components screen, do the following:
   - Select **Create a New Prefix**, and enter a prefix to use for the database schemas. Example: `DEV` or `PROD`. Prefixes are used to create logical groupings of multiple repositories in a database. For more information, see *Oracle Fusion Middleware Repository Creation Utility User's Guide*.

     Tip: Note the name of the schema because the upcoming steps require this information.

     Select the following:
   - If you are installing the SOA schemas, select **SOA and BPM Infrastructure**, which includes **SOA Infrastructure** and **User Messaging Service**.
   - For WebCenter Suite, select all schemas.

Note: This will auto-select **Metadata Services** as well.

- For Oracle Enterprise Content Management, expand **Enterprise Content Management**, and select **Oracle Content Server 11g - Complete**.

Click **Next**.

8. In the Schema Passwords screen, enter passwords for the main and additional (auxiliary) schema users, and click **Next**.
9. In the Map Tablespaces screen, choose the tablespaces for the selected components, and click **Next**.
10. In the Summary screen, click **Create**.
11. In the Completion Summary screen, click **Close**.

2.1.3 Configuring SOA Schemas for Transactional Recovery Privileges

You need the appropriate database privileges to allow the Oracle WebLogic Server transaction manager to query for transaction state information and issue the appropriate commands, such as commit and rollback, during recovery of in-flight transactions after a WebLogic Server container crash.

To configure the SOA schemas for transactional recovery privileges:

1. Log on to sqlplus 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>
```

Note: These privileges should be granted to the owner of the soainfra schema, as determined by the RCU operations.

2.1.4 Backing Up the Database

After you have loaded the metadata repository in your database, you should make a backup.

Backing up the database is for the explicit purpose of quick recovery from any issue that may occur in the further steps. You can choose to use your backup strategy for the database for this purpose or simply take a backup using OS tools or RMAN for this purpose. It is recommended to use Oracle Recovery Manager for the database, particularly if the database was created using Oracle ASM. If possible, a cold backup using operating system tools such as tar can also be performed.

2.2 Network

This section covers the following topics:

- Section 2.2.1, "Virtual Server Names"
- Section 2.2.2, "Load Balancers"
- Section 2.2.3, "IPs and Virtual IPs"
- Section 2.2.4, "Firewalls and Ports"

2.2.1 Virtual Server Names

The WebCenter enterprise topology uses the following virtual server names:

- Section 2.2.1.1, "wc.mycompany.com"
- Section 2.2.1.2, "admin.mycompany.com"
- Section 2.2.1.3, "wcinternal.mycompany.com"

Ensure that the virtual server names are associated with IP addresses and are part of your DNS. The nodes running Oracle Fusion Middleware must be able to resolve these virtual server names.

2.2.1.1 wc.mycompany.com

`wc.mycompany.com` is a virtual server name that acts as the access point for all HTTP traffic to the runtime SOA and WebCenter components, such as soa-infra, workflow, and B2B. Traffic to SSL is configured. Clients access this service using the address `wc.mycompany.com:443`. This virtual server is defined on the load balancer.

2.2.1.2 admin.mycompany.com

`admin.mycompany.com` is a virtual server name that acts as the access point for all internal HTTP traffic that is directed to administration services such as WebLogic Administration Server Console and Oracle Enterprise Manager.

The incoming traffic from clients is not SSL-enabled. Clients access this service using the address `admin.mycompany.com:80` and the requests are forwarded to port 7777 on WEBHOST1 and WEBHOST2.

This virtual server is defined on the load balancer.

2.2.1.3 wcinternal.mycompany.com

`wcinternal.mycompany.com` is a virtual server name used for internal invocations like callbacks and internal access to services. This url is not exposed to the internet and is only accessible from the intranet.

The incoming traffic from clients is not SSL-enabled. Clients access this service using the address `wcinternal.mycompany.com:80` and the requests are forwarded to port 7777 on WEBHOST1 and WEBHOST2.

This virtual server is defined on the load balancer.

2.2.2 Load Balancers

This enterprise topology uses an external load balancer. For more information on load balancers, see Section 1.5.2, "Web Tier."

Note: The Oracle Technology Network (`http://www.oracle.com/technology/index.html`) provides a list of validated load balancers and their configuration at `http://www.oracle.com/technology/products/ias/hi_av/Tested_LBR_FW_SSLAccel.html`.

2.2.2.1 Configuring the Load Balancer

To configure the load balancer, complete these steps:

1. Create a pool of servers. You will assign this pool to virtual servers.
2. Add the addresses of the Oracle HTTP Server hosts to the pool. For example:
   - WEBHOST1:7777
   - WEBHOST2:7777
3. Configure a virtual server in the load balancer for `wc.mycompany.com:443`.
   - For this virtual server, use your system's frontend address as the virtual server address (for example, `wc.mycompany.com`). The frontend address is the externally facing host name used by your system and that will be exposed in the Internet.
   - Configure this virtual server with port 80 and port 443. Any request that goes to port 80 should be redirected to port 443.
   - Specify ANY as the protocol.
   - Enable address and port translation.
   - Enable reset of connections when services and/or nodes are down.
   - Assign the pool created in step 1 to the virtual server.
   - Create rules to filter out access to `/console` and `/em` on this virtual server.
4. Configure a virtual server in the load balancer for `admin.mycompany.com:80`.
   - For this virtual server, use your internal administration address as the virtual server address (for example, `admin.mycompany.com`). This address is typically not externalized.
   - Specify HTTP as the protocol.
   - Enable address and port translation.
   - Enable reset of connections when services and/or nodes are down.
   - Assign the pool created in step 1 to the virtual server.
5. Configure a virtual server in the load balancer for `wcinternal.mycompany.com:80`.
   - For this virtual server, use your internal administration address as the virtual server address (for example, `wcinternal.mycompany.com`). This address is typically not externalized.
   - Specify HTTP as the protocol.
   - Enable address and port translation.
   - Enable reset of connections when services and/or nodes are down.
   - Assign the pool created in step 1 to the virtual server.

- Optionally, create rules to filter out access to `/console` and `/em` on this virtual server.

6. Configure monitors for the Oracle HTTP Server nodes to detect failures in these nodes.
   - Set up a monitor to regularly ping the "/" URL context.

     Tip: Use `GET /\n\n` instead if the Oracle HTTP Server's document root does not include `index.htm` and Oracle WebLogic Server returns a 404 error for "/".

   - For the ping interval, specify a value that does not overload your system. You can try 5 seconds as a starting point.
   - For the timeout period, specify a value that can account for the longest time response that you can expect from your WebCenter system, that is, specify a value greater than the longest period of time any of your requests to HTTP servers can take.

2.2.3 IPs and Virtual IPs

Configure the Administration Server and the managed servers to listen on different virtual Ips and physical IPs as illustrated in Figure 2–1. As shown in this figure, each VIP and IP is attached to the WebLogic server that uses it. VIP1 is failed manually to restart the Administration Server in SOAHOST2. VIP2 and VIP3 fail over from SOAHOST1 to SOAHOST2 and from SOAHOST2 to SOAHOST1 respectively through Oracle WebLogic Server Migration feature. See *Oracle Fusion Middleware High Availability Guide* for information on the WebLogic Server Migration feature. Physical IPs (non virtual) are fixed to each node. IP1 is the physical IP of SOAHOST1 and is used by the WLS_WSM1 WebServices Policy Manager server. IP2 is the physical IP of SOAHOST2 and is used by the WLS_WSM2 WebServices Policy Manager server.

Figure 2–1 IPs and VIPs Mapped to Administration Server and Managed Servers

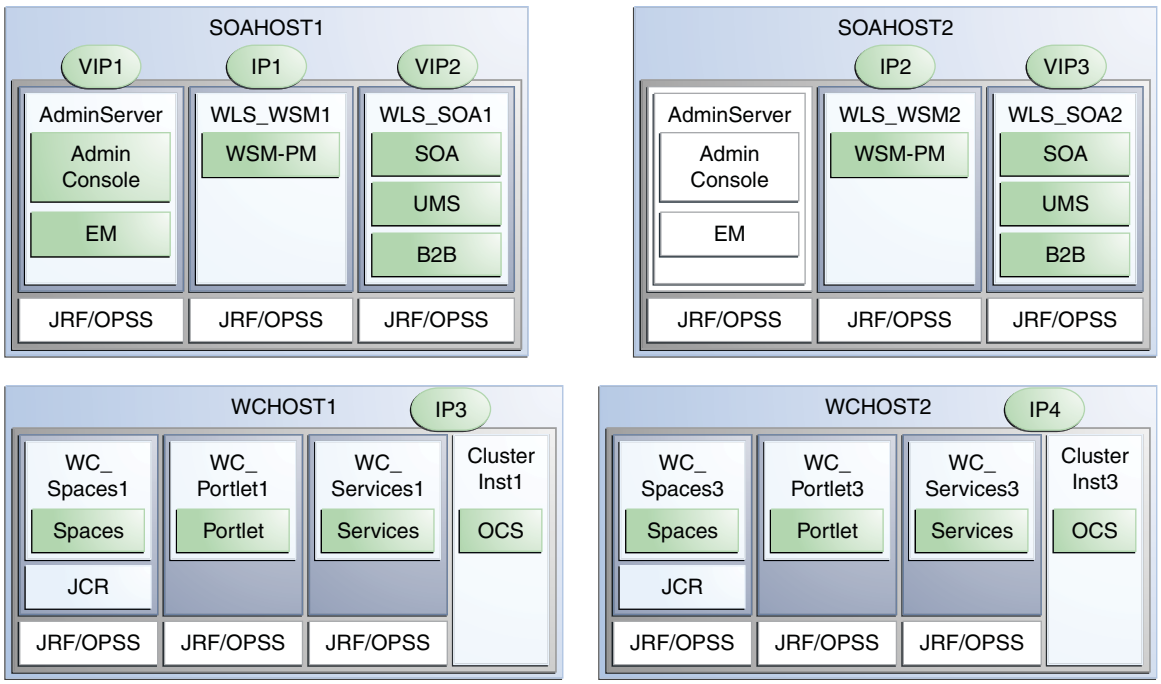


Table 2–2 provides descriptions of the various virtual hosts.

Table 2–2 Virtual Hosts

Virtual IP	VIP Maps to...	Description
VIP1	ADMINVHN	ADMINVHN is the virtual host name that is 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 (SOAHOST1 by default).
VIP2	SOAHOST1VHN1	SOAHOST1VHN1 is the virtual host name that maps to the listen address for WLS_SOA1 and fails over with server migration of this managed server. It is enabled on the node where WLS_SOA1 process is running (SOAHOST1 by default).
VIP3	SOAHOST2VHN1	SOAHOST2VHN1 is the virtual host name that maps to the listen address for WLS_SOA2 and fails over with server migration of this managed server. It is enabled on the node where WLS_SOA2 process is running (SOAHOST2 by default).

2.2.4 Firewalls and Ports

Many Oracle Fusion Middleware components and services use ports. As an administrator, you must know the port numbers used by these services, and to ensure that the same port number is not used by two services on a host.

Most port numbers are assigned during installation.

Table 2–3 lists the ports used in the WebCenter topology, including the ports that you must open on the firewalls in the topology.

Firewall notation:

- FW0 refers to the outermost firewall.
- FW1 refers to the firewall between the web tier and the application tier.
- FW2 refers to the firewall between the application tier and the data tier.

Table 2–3 Ports Used

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 all HTML content and the type of process model used for WebCenter.
Browser request	FW0	443	HTTPS / Load Balancer	Inbound	Timeout depends on all HTML content and the type of process model used for WebCenter.
Browser request	FW1	80	HTTPS / Load Balancer	Outbound (for intranet clients)	Timeout depends on all HTML content and the type of process model used for SOA.
Browser request	FW1	443	HTTPS / Load Balancer	Outbound (for intranet clients)	Timeout depends on all HTML content and the type of process model used for SOA.

Table 2–3 (Cont.) Ports Used

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Callbacks and Outbound invocations	FW1	80	HTTPS / Load Balancer	Outbound	Timeout depends on all HTML content and the type of process model used for SOA.
Callbacks and Outbound invocations	FW1	443	HTTPS / Load Balancer	Outbound	Timeout depends on all HTML content and the type of process model used for SOA.
Load balancer to Oracle HTTP Server	n/a	7777	HTTP	n/a	See Section 2.2.2.1, "Configuring the Load Balancer."
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	OPMN port (6701) and OHS Admin Port (7779)	TCP and HTTP, respectively	Outbound	Set the timeout to a short period (5-10 seconds).
WSM-PM access	FW1	7010 Range: 7010 - 7999	HTTP / WLS_ WSM-PM*n*	Inbound	Set the timeout to 60 seconds.
Communication between WSM Cluster members	n/a	7010	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
Communication between Spaces_ Cluster members	n/a	9000	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
Communication between Portlet_ Cluster members	n/a	9001	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
Communication between Collab_ Cluster members	n/a	9002	TCP/IP Unicast	n/a	By default, this communication uses the same port as the server's listen address.
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.
Administration Console access	FW1	7001	HTTP / Administration Server and Enterprise Manager t3	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).

Table 2–3 (Cont.) Ports Used

Type	Firewall	Port and Port Range	Protocol / Application	Inbound / Outbound	Other Considerations and Timeout Guidelines
Node Manager	n/a	5556	TCP/IP	n/a	n/a For actual values, see "Firewalls and Ports" in *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*.
Access Server access	FW1	6021	OAP	Inbound	For actual values, see "Firewalls and Ports" in Oracle Fusion *Middleware Enterprise Deployment Guide for Oracle Identity Management*.
Identity Server access	FW1	6022	OAP	Inbound	
Database access	FW2	1521	SQL*Net	Both	Timeout depends on all database content and on the type of process model used for WebCenter.
Oracle Internet Directory access	FW2	389	LDAP	Inbound	You should tune the directory server's parameters based on load balancer, and not the other way around.
Oracle Internet Directory access	FW2	636	LDAP SSL	Inbound	You should tune the directory server's parameters based on load balancer, and not the other way around.
Content Manager access	FW2	9054	TCP/IP socket	n/a	n/a
JOC for OWSM	n/a	9999	TCP/IP	n/a	n/a
Coherence for deployment	n/a	8088 Range: 8000 - 8090		n/a	n/a

2.3 Shared Storage and Recommended Directory Structure

This following section details the directories and directory structure that Oracle recommends for an Enterprise Deployment topology. Other directory layouts are possible and supported, but the model adopted in this guide is chosen 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.

This section covers these topics:

- Section 2.3.1, "Terminology for Directories and Directory Environment Variables"
- Section 2.3.2, "Recommended Locations for the Different Directories"
- Section 2.3.3, "Shared Storage Configuration"

2.3.1 Terminology for Directories and Directory Environment Variables

- **ORACLE_BASE:** This environment variable and related directory path refers to the base directory under which Oracle products are installed.
- **MW_HOME:** This environment variable and related directory path refers to the location where Fusion Middleware (FMW) resides.
- **WL_HOME:** This environment variable and related directory path contains installed files necessary to host a WebLogic Server.
- **ORACLE_HOME:** This environment variable and related directory path refers to the location where either Oracle FMW SOA Suite or Oracle WebCenter Suite is installed.
- **ORACLE_COMMON_HOME:** This environment variable and related directory path refers to the Oracle home that contains the binary and library files required for the Oracle Enterprise Manager Fusion Middleware Control and Java Required Files (JRF).
- **DOMAIN Directory:** This directory path refers to the location where the Oracle WebLogic Domain information (configuration artifacts) is stored. Different WLS Servers can use different domain directories even when in the same node as described below.
- **ORACLE_INSTANCE:** An Oracle instance contains one or more system components, such as Oracle Web Cache, Oracle HTTP Server, or Oracle Internet Directory. An Oracle instance directory contains updateable files, such as configuration files, log files, and temporary files.

2.3.2 Recommended Locations for the Different Directories

Oracle Fusion Middleware 11*g* allows creating multiple SOA or WebCenter managed servers from one single binary installation. This allows the installation of binaries in a single location on a shared storage and the reuse of this installation by the servers in different nodes. However, for maximum availability, Oracle recommends using redundant binary installations. In the Enterprise Deployment model, two MW HOMEs (each of which has a WL_HOME and an ORACLE_HOME for each product suite) are installed in a shared storage. Additional servers (when scaling out or up) of the same type can use either one of these two locations without requiring more installations. Ideally, users should use two different volumes (referred to as VOL1 and VOL2 below) for redundant binary location, thus isolating as much as possible the failures in each volume. For additional protection, Oracle recommends that these volumes are disk mirrored. If multiple volumes are not available, Oracle recommends using mount points to simulate the same mount location in a different directory in the shared storage. Although this does not guarantee the protection that multiple volumes provide, it does allow protection from user deletions and individual file corruption.

When an ORACLE_HOME or a WL_HOME is shared by multiple servers in different nodes, it is recommended to maintain the Oracle Inventory and Middleware home list in those nodes updated for consistency in the installations and application of patches. To update the oraInventory in a node and "attach" an installation in a shared storage to it, use `ORACLE_HOME/oui/bin/attachHome.sh`. To update the Middleware home list to add or remove a WL_HOME, edit the `<user_home>/bea/ beahomelist` file. This would be required for any nodes installed additionally to the two ones used in this Enterprise Deployment. An example of the oraInventory and beahomelist updates is provided in the scale-out steps included in this guide.

Oracle recommends also separating the domain directory used by the Administration Server from the domain directory used by managed servers. This allows a symmetric

configuration for the domain directories used by managed server, and isolates the failover of the Administration Server. The domain directory for the Administration Server must reside in a shared storage to allow failover to another node with the same configuration. The managed servers' domain directories can reside in a local or shared storage.

You can use a shared domain directory for all managed servers in different nodes or use one domain directory per node. Sharing domain directories for managed servers facilitates the scale-out procedures. In this case, the deployment should conform to the requirements (if any) of the storage system to facilitate multiple machines mounting the same shared volume. The configuration steps provided in this Enterprise Deployment Topology assume that a local (per node) domain directory is used for each managed server

All procedures that apply to multiple local domains apply to a single shared domain. Hence, this enterprise deployment guide uses a model where one domain directory is used per node. The directory can be local or reside in shared storage.

JMS file stores and JTA transaction logs need to be placed on a shared storage in order to ensure that they are available from multiple boxes for recovery in the case of a server failure or migration.

Based on the above assumptions, the following paragraphs describe the directories recommended. Wherever a shared storage location is directly specified, it is implied that shared storage is required for that directory. When using local disk or shared storage is optional the mount specification is qualified with "if using a shared disk." The shared storage locations are examples and can be changed as long as the provided mount points are used. However, Oracle recommends this structure in the shared storage device for consistency and simplicity.

ORACLE_BASE:

/u01/app/oracle

MW_HOME (application tier):

ORACLE_BASE/product/fmw

- Mount point: ORACLE_BASE/product/fmw
- Shared storage location: ORACLE_BASE/product/fmw (VOL1 and VOL2)

> **Note:** When there is just one volume available in the shared storage, you can provide redundancy using different directories to protect from accidental file deletions and for patching purposes. Two MW_HOMEs would be available; at least one at *ORACLE_BASE*/product/fmw1, and another at *ORACLE_BASE*/product/fmw2. These MW_HOMEs are mounted on the same mount point in all nodes.

- Mounted from: Nodes alternatively mount VOL1 or VOL2 so that at least half of the nodes use one installation, and half use the other.

  In a SOA Enterprise Deployment topology, SOAHOST1 mounts VOL1 and SOAHOST2 mounts VOL2. When only one volume is available, nodes mount the two suggested directories in shared storage alternately. For example, SOAHOST1 would use *ORACLE_BASE*/product/fmw1 as a shared storage location, and SOAHOST2 would use *ORACLE_BASE*/product/fmw2 as a shared storage location)

MW_HOME (web tier):

ORACLE_BASE/product/fmw/web

- Mount point: ORACLE_BASE/product/fmw
- Shared storage location: ORACLE_BASE/product/fmw (VOL1 and VOL2)

> **Note:** Web Tier installation is typically performed on local storage to the WEBHOST nodes. When using shared storage, consider the appropriate security restrictions for access to the storage device across tiers.
>
> This enterprise deployment guide assumes that the Oracle Web Tier will be installed onto local disk. You may install the Oracle Web Tier binaries (and the ORACLE_INSTANCE) onto shared disk. If so, the shared disk MUST be separate from the shared disk used for the application tier.

- Mounted from: For Shared Storage installations, nodes alternatively mount VOL1 or VOL2 so that at least half of the nodes use one installation, and half use the other.

  In a SOA Enterprise Deployment topology, WEBHOST1 mounts VOL1 and WEBHOST2 mounts VOL2. When only one volume is available, nodes mount the two suggested directories in shared storage alternately. For example, WEBHOST1 would use *ORACLE_BASE*/product/fmw1 as a shared storage location, and WEBHOST2 would use *ORACLE_BASE*/product/fmw2 as a shared storage location).

WL_HOME:

MW_HOME/wlserver_10.3

ORACLE_HOME:

MW_HOME/wc

ORACLE_COMMON_HOME:

MW_HOME/oracle_common

ORACLE_INSTANCE:

ORACLE_BASE/admin/*instance_name*

- If you are using a shared disk, the mount point on the machine is `ORACLE_BASE/admin/<instance_name>` mounted to `ORACLE_BASE/admin/<instance_name>` (VOL1).

> **Note:** `(VOL1)` is optional; you could also use `(VOL2)`.

Domain Directory for Administration Server Domain Directory:

ORACLE_BASE/admin/*domain_name*/aserver/*domain_name* (The last "domain_name" is added by config wizard)

- Mount point on machine: *ORACLE_BASE*/admin/*domain_name*/aserver
- Shared storage location: *ORACLE_BASE*/admin/*domain_name*/aserver

- Mounted from: Only the node where the Administration Server is running needs to mount this directory. When the Administration Server is relocated (failed over) to a different node, the node then mounts the same shared storage location on the same mount point. The remaining nodes in the topology do not need to mount this location

Domain Directory for Managed Server Domain Directory:

ORACLE_BASE/admin/*domain_name*/mserver/*domain_name*

- If you are using a shared disk, the mount point on the machine is `ORACLE_BASE/admin/<domain_name>/mserver` mounted to `/ORACLE_BASE/admin/<domain_name>/Noden/mserver/` (each node uses a different domain directory for managed servers).

> **Note:** This procedure is really shared storage dependent. The above example is specific to NAS, but other storage types may provide this redundancy with different types of mappings.

Location for JMS file-based stores and Tlogs (SOA only):

ORACLE_BASE/admin/*domain_name*/*soa_cluster_name*/jms

ORACLE_BASE/admin/*domain_name*/*soa_cluster_name*/tlogs

- Mount point: *ORACLE_BASE*/admin/*domain_name*/*soa_cluster_name*/
- Shared storage location: *ORACLE_BASE*/admin/*domain_name*/*soa_cluster_name*/
- Mounted from: All nodes running SOA or BAM must mount this shared storage location so that transaction logs and JMS stores are available when server migration to another node take place.

Location for Application Directory for the Administration Server

ORACLE_BASE/admin/*domain_name*/aserver/applications

- Mount point: *ORACLE_BASE*/admin/*domain_name*/aserver/
- Shared storage location: *ORACLE_BASE*/admin/*domain_name*/aserver
- Mounted from: Only the node where the Administration Server is running must mount this directory. When the Administration Server is relocated (failed over) to a different node, the node then mounts the same shared storage location on the same mount point. The remaining nodes in the topology do not need to mount this location

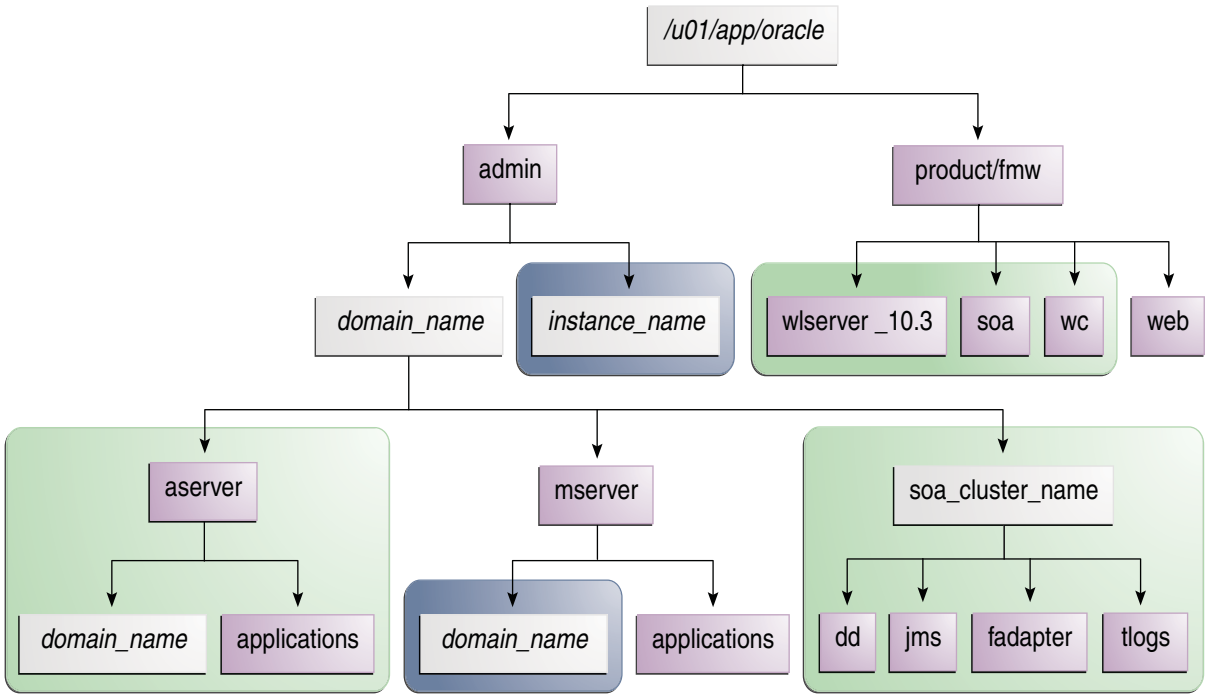
Location for Application Directory for Managed Server

ORACLE_BASE/admin/*domain_name*/mserver/applications

> **Note:** This directory is local in the context of a SOA enterprise deployment.

Figure 2–2 shows this directory structure in a diagram.

Figure 2–2 Directory Structure



The directory structure in Figure 2–2 does not show other required internal directories, such as `oracle_common` and `jrockit`.

Table 2–4 explains what the various color-coded elements in the diagram mean.

Table 2–4 Directory Structure Elements

Element	Explanation
	The Administration Server domain directories, applications, deployment plans, file adapter control directory, JMS and TX logs, and the entire MW_HOME are on a shared disk.
	The managed server domain directories can be on a local disk or a shared disk. Further, if you want to share the managed server domain directories on multiple nodes, then you must mount the same shared disk location across the nodes. The `instance_name` directory for the web tier can be on a local disk or a shared disk.
	Fixed name.
	Installation-dependent name.

Figure 2–3 shows an example configuration for shared storage with multiple volumes for WebCenter.

Figure 2–3 Example Configuration for Shared Storage

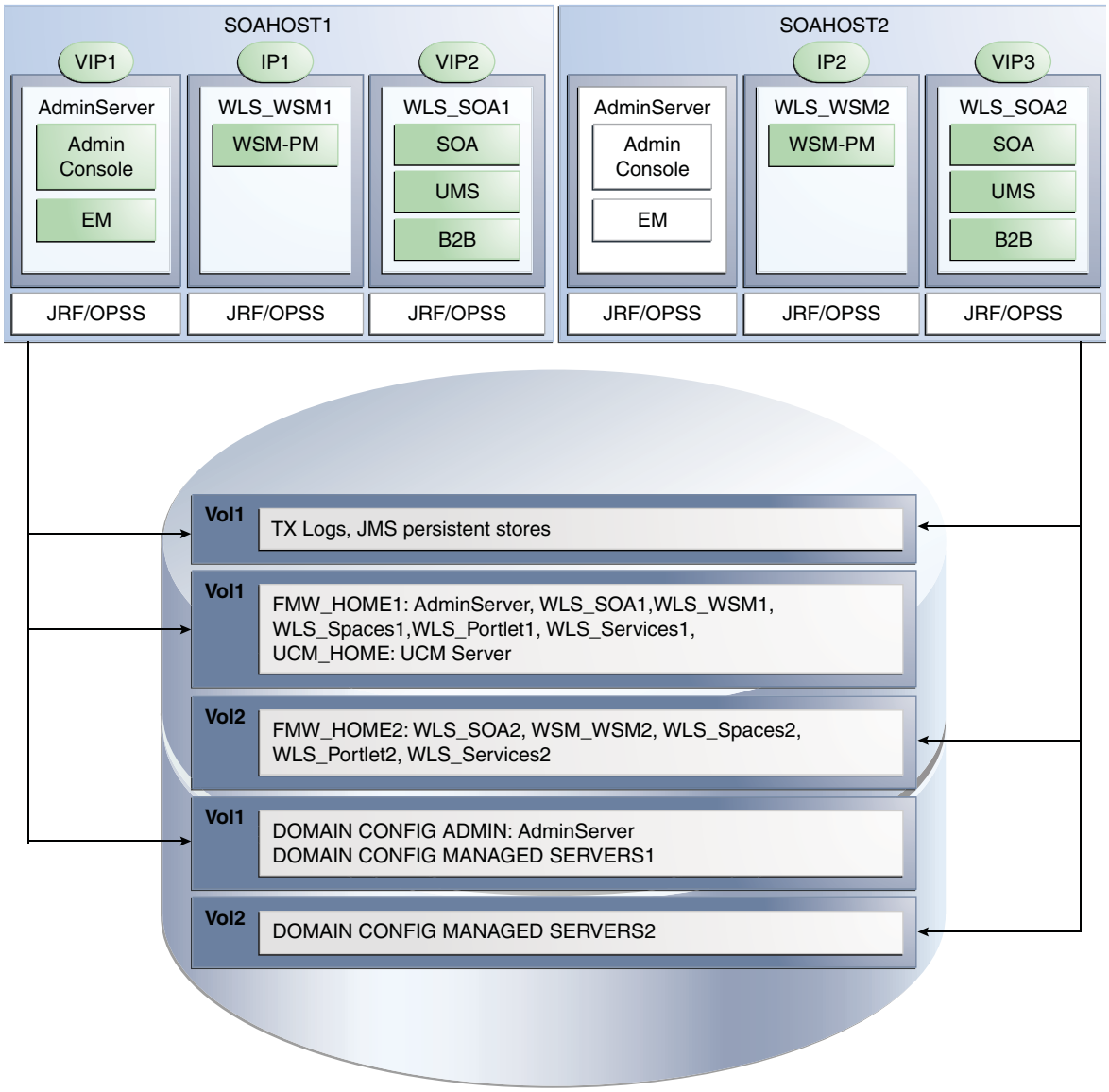


Table 2–5 summarizes the directory structure for the domain. In the table, "WLS_WC" refers to all the WebCenter managed servers: WC_Spaces, WC_Portlet, WC_Utilities, and WC_Collaboration.

Table 2–5 Contents of Shared Storage

Server	Type of Data	Volume in Shared Storage	Directory	Files
WLS_SOA1	Tx Logs	VOL1	ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/tlogs	The transaction directory is common (decided by WebLogic Server), but the files are separate.
WLS_SOA2	Tx Logs	VOL1	ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/tlogs	The transaction directory is common (decided by WebLogic Server), but the files are separate.
WLS_SOA1	JMS Stores	VOL1	ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/jms	The transaction directory is common (decided by WebLogic Server), but the files are separate; for example: SOAJMSStore1, UMSJMSStore1, and so on.
WLS_SOA2	JMS Stores	VOL1	ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/jms	The transaction directory is common (decided by WebLogic Server), but the files are separate; for example: SOAJMSStore2, UMSJMSStore2, etc.
WLS_SOA1	WLS Install	VOL1	MW_HOME	Individual in each volume, but both servers see same directory structure.
WLS_SOA2	WLS Install	VOL2	MW_HOME	Individual in each volume, but both servers see same directory structure.
WLS_WC1	WLS Install	VOL1	MW_HOME	Individual in each volume, but both servers see same directory structure.
WLS_WC2	WLS Install	VOL2	MW_HOME	Individual in each volume, but both servers see same directory structure.
WLS_SOA1	SOA Install	VOL1	MW_HOME/ soa	Individual in each volume, but both servers see same directory structure.
WLS_SOA2	SOA Install	VOL2	MW_HOME/ soa	Individual in each volume, but both servers see same directory structure.
WLS_WC1	WebCenter Install	VOL1	MW_HOME/wc	Individual in each volume, but both servers see same directory structure.
WLS_WC2	WebCenter Install	VOL2	MW_HOME/wc	Individual in each volume, but both servers see same directory structure.
WLS_SOA1	Domain Config	VOL1	ORACLE_BASE/admin/<domain_name>/mserver/<domain_name>	Individual in each volume, but both servers see same directory structure.

Table 2–5 (Cont.) Contents of Shared Storage

Server	Type of Data	Volume in Shared Storage	Directory	Files
WLS_SOA2	Domain Config	VOL2	ORACLE_BASE/admin/<domain_name>/mserver/<domain_name>	Individual in each volume, but both servers see same directory structure.
WLS_WC1	Domain Config	VOL1	MW_HOME/user_projects_domains/edgdomain	Individual in each volume, but both servers see same directory structure.
WLS_WC2	Domain Config	VOL2	MW_HOME/user_projects_domains/edgdomain	Individual in each volume, but both servers see same directory structure.

2.3.3 Shared Storage Configuration

The following steps show to create and mount shared storage locations so that SOAHOST1, SOAHOST2, WCHOST1, and WCHOST2 can see the same location for binary installation in two separate volumes.

"nasfiler" is the shared storage filer.

From SOAHOST1 and WCHOST1:

```
SOAHOST1> mount nasfiler:/vol/vol1/u01/app/oracle/product/fmw
/u01/app/oracle/product/fmw -t nfs
```

From SOAHOST2 and WCHOST2:

```
SOAHOST2> mount nasfiler:/vol/vol2/u01/app/oracle/product/fmw
/u01/app/oracle/product/fmw -t nfs
```

If only one volume is available, users can provide redundancy for the binaries by using two different directories in the shared storage and mounting them to the same dir in the SOA Servers:

From SOAHOST1:

```
SOAHOST1> mount nasfiler:/vol/vol1/u01/app/oracle/product/fmw1
/u01/app/oracle/product/fmw -t nfs
```

From SOAHOST2:

```
SOAHOST2> mount nasfiler:/vol/vol1/u01/app/oracle/product/fmw
/u01/app/oracle/product/fmw -t nfs
```

The following commands show how to share the SOA TX logs location across different nodes:

```
SOAHOST1> mount nasfiler:/vol/vol1/u01/app/oracle/stores/soadomain/soa_
cluster/tlogs
/u01/app/oracle/stores/soadomain/soa_cluster/tlogs -t nfs

SOAHOST2> mount nasfiler:/vol/vol1/u01/app/oracle/stores/soadomain/soa_
cluster/tlogs
/u01/app/oracle/stores/soadomain/soa_cluster/tlogs -t nfs
```

Note: The shared storage can be a NAS or SAN device. The following illustrates an example of creating storage for a NAS device from SOAHOST1. The options may differ.

```
SOAHOST1> mount nasfiler:/vol/vol1/fmw11shared ORACLE_BASE/wls -t
nfs -o rw,bg,hard,nointr,tcp,vers=3,timeo=300,rsize=32768,
wsize=32768
```

Contact your storage vendor and machine administrator for the correct options for your environment.

Note: The user ID 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 section 3.3, "Understanding Installation and Configuration Privileges and Users" in the *Oracle Fusion Middleware Installation Planning Guide*.

2.4 LDAP as Credential and Policy Store

With Oracle Fusion Middleware, you can use different types of credential and policy stores in a WebLogic domain. Domains can use stores based on XML files or on different types of LDAP providers. When a domain uses an LDAP store, all policy and credential data is kept and maintained in a centralized store. However, when using XML policy stores, the changes made on managed servers are not propagated to the Administration Server unless they use the same domain home.

An Oracle Fusion Middleware SOA Suite Enterprise Deployment Topology uses different domain homes for the Administration Server and the managed server as described in the Section 2.3, "Shared Storage and Recommended Directory Structure." Derived from this, and for integrity and consistency purposes, Oracle requires the use of an LDAP as policy and credential store in context of Oracle Fusion Middleware SOA Suite Enterprise Deployment Topology. To configure the Oracle Fusion Middleware SOA Suite Enterprise Deployment Topology with an LDAP as Credential and Policy store, follow the steps in Section 10.1, "Credential and Policy Store Configuration.".

3

Installing Oracle HTTP Server

You install and configure Oracle HTTP Server on nodes in the web tier.

This chapter contains the following sections:

3.1 Installing Oracle HTTP Server on WEBHOST1 and WEBHOST2

As described in Section 2.3, "Shared Storage and Recommended Directory Structure," Oracle recommends installing Oracle Web Tier onto local disk. You may, however, install the Web Tier onto shared disk, if this is the case:

- Ensure the software is installed in at least two storage locations for redundancy.
- The shared storage is different to that which is used for the application tier.

To install Oracle HTTP Server on WEBHOST1 and WEBHOST2:

1. Check that your machines meet the following requirements:
   - Ensure that the system, patch, kernel, and other requirements are met as specified in the installation guide.
   - Because Oracle HTTP Server is installed by default on port *7777*, you must ensure that port *7777* is not used by any service on the nodes. To check if this port is in use, run the following command before installing Oracle HTTP Server. You must free the ports if they are in use.

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

   If the `/etc/oraInst.loc` file does not exist, you can skip this step.
3. Start the Oracle Universal Installer from the Oracle Fusion Middleware 11*g* WebTier and Utilities DVD by issuing this command:

   ```
   runInstaller
   ```
4. If the Specify Inventory Directory screen appears, enter the location for the inventory and the user group and then click **OK**; otherwise, ignore steps 4 and 5 and continue with step 6.
5. Execute the root privileged actions as indicated in the dialog and then click **OK**.

6. In the **Welcome** screen, click **Next**.
7. In the **Select Installation Type** screen, select **Install and Configure**, and click **Next**.
8. In the **Prerequisite Checks** screen, ensure that all the prerequisites are met, then click **Next**.
9. In the **Specify Installation Location** screen, do the following:
   - On WEBHOST1, set the location to:

     Oracle Middleware Home: *MW_HOME*

     Oracle Home Directory: Web
   - On WEBHOST2, set the location to:

     Oracle Middleware Home: *MW_HOME*

     Oracle Home Directory: Web

   Click **Next**.
10. In the **Configure Components** screen, do the following:
    - Select **Oracle Http Server**.
    - Do *not* select **Oracle Web Cache**.
    - Do *not* select **Associate Selected Components with WebLogic Domain** because you have not yet installed WebLogic Server.

    Click **Next**.
11. In the **Specify Component Details** screen, do the following:
    - Enter the following values for WEBHOST1:
      - **Instance Home Location**: `ORACLE_BASE/admin/<instance_name>`
      - **Instance Name**: `ohs_instance1`
      - **OHS Component Name**: `ohs1`
    - Enter the following values for WEBHOST2:
      - **Instance Home Location**: `ORACLE_BASE/admin/<instance_name>`
      - **Instance Name**: `ohs_instance2`
      - **OHS Component Name**: `ohs2`

    Click **Next**.
12. In the **Configure Ports** screen, do the following:
    - Select **Specify Ports using Configuration File** and copy the *staticports.ini* template file from your installation disk (the file is located in the */Disk1/stage/Response* directory) to you user's home. Then use the **Browse** button to select this file.
    - Click **View/Edit File** to open the *staticports.ini* file in an editor.
    - Change the Oracle HTTP Server port in that file to 7777.
    - Save the file.

    Click **Next**.

Note: For more information on setting ports, refer to *Oracle Fusion Middleware Installation Guide for Oracle SOA Suite*.

13. In the **Specify Security Updates** screen, enter your e-mail address to receive e-mail notifications of security issues (if required). Enter your Oracle Support Password to receive security updates through My Oracle Support.
14. In the **Installation Summary** screen, ensure that the selections are correct, and click **Install**.
15. In the **Configuration** screen, multiple configuration assistants are launched in succession, which can be a lengthy process. When it completes, the **Configuration Completed** screen appears.
16. In the **Installation Completed** screen, click **Finish** to exit.

3.2 Validating Oracle HTTP Server Through the Load Balancer

Define the directives of the `<VirtualHost>` section of the httpd.conf file on both OHS servers. This file is located in the `ORACLE_BASE/admin/<instance_name>/config/OHS/ohs1` (or `ohs2`) directory. Add the following entries to the file:

```
NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName https://wc.mycompany.com:443
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit
</VirtualHost>

NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName admin.mycompany.com:80
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit
</VirtualHost>

NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName wcinternal.mycompany.com:80
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit
</VirtualHost>
```

Make sure that you restart both OHS servers after modifying the `httpd.conf` files:

```
WEBHOST> cd ORACLE_BASE/admin/<instance_name>/bin
WEBHOST> opmnctl stopall
WEBHOST> opmnctl startall
```

Access the following URLs to ensure that your load balancer and Oracle HTTP Server are configured properly:

- `http://wc.mycompany.com/index.html`
- `http://admin.mycompany.com/index.html`
- `http://wcinternal.mycompany.com/index.html`

- `https://wc.mycompany.com/index.html`

3.3 Backing Up Oracle HTTP Server

After you have verified that the Oracle HTTP Server installation is working, back up the installation. This is a quick backup for the express purpose of immediate restore in case of problems in the further steps. The backup destination is the local disk. This backup can be discarded once the enterprise deployment setup is complete. At this point, the regular deployment-specific backup and recovery process can be initiated. The *Oracle Fusion Middleware Administrator's Guide* provides further details. For information on describing the Oracle HTTP Server data that must be backed up and restored, refer to the "Backup and Recovery Recommendations for Oracle HTTP Server" section in this guide. For information on how to recover components, see "Recovery of Components" and "Recovery After Loss of Component" sections in the guide. For recommendations specific to recovering from the loss of a host, see the "Recovering Oracle HTTP Server to a Different Host" in the guide.

To back up the installation a this point, complete these steps:

1. Shut down the instance using `opmnctl`.

   ORACLE_BASE`/admin/`*instance_name*`/bin/opmnctl stopall`

2. Back up the Middleware Home on the web tier using the following command:

   `tar -cvpf BACKUP_LOCATION/web.tar MW_HOME/web`

3. Back up the Instance Home on the web tier using the following command:

   `tar -cvpf BACKUP_LOCATION/web_`*instance_name*`.tar` *ORACLE_INSTANCE*

4. Start the instance using `opmnctl`:

   ORACLE_BASE`/admin/`*instance_name*`bin/opmnctl startall`

4

Creating a Domain

This chapter describes how to create a domain using the Configuration Wizard, Oracle WebLogic Server Administration Console, Oracle Enterprise Manager, and Oracle WSM Policy Manager. You can extend the domain to add WebCenter components.

Important: Oracle strongly recommends that you read the release notes for any additional installation and deployment considerations prior to starting the setup process.

This chapter contains the following sections:

- Section 4.17, "Configuring the Java Object Cache for Oracle WSM"
- Section 4.18, "Configuring Oracle HTTP Server for the Administration Server and the WLS_WSM-PMn Managed Servers"
- Section 4.19, "Registering Oracle HTTP Server With WebLogic Server"
- Section 4.20, "Setting the Frontend URL for the Administration Console and Setting Redirection Preferences"
- Section 4.21, "Validating Access Through Oracle HTTP Server"
- Section 4.22, "Manually Failing Over the Administration Server to SOAHOST2"
- Section 4.23, "Validating Access to SOAHOST2 Through Oracle HTTP Server"
- Section 4.24, "Failing the Administration Server Back to SOAHOST1"
- Section 4.25, "Backing Up the Installation"

4.1 Installing Oracle Fusion Middleware Home

As described in Section 2.3, "Shared Storage and Recommended Directory Structure," you install Oracle Fusion Middleware in at least two storage locations for redundancy.

You must install the following components of Oracle Fusion Middleware:

- Oracle WebLogic Server (see Section 4.1.1, "Installing Oracle WebLogic Server")
- Oracle WebCenter (see Section 4.1.2, "Installing Oracle Fusion Middleware for WebCenter")

4.1.1 Installing Oracle WebLogic Server

Perform these steps to install Oracle WebLogic Server on SOAHOST1, SOAHOST2, WCHOST1,and WCHOST2.

For information about running the generic installer for installing WebLogic Server on 64-bit platforms using a 64-bit JDK, see the section "Installing WebLogic Server on 64-Bit Platforms Using a 64-Bit JDK" in the *Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*.

To install Oracle WebLogic Server:

1. Start the Oracle WebLogic Server installer

   For UNIX (Linux used in this example):

   ```
   SOAHOST1> wls_linux32.bin
   ```

   For Windows operating systems:

   ```
   SOAHOST1> wls_win32.exe
   ```

2. In the Welcome screen, click **Next**.
3. In the Choose Middleware Home Directory screen, do the following:
   - Select **Create a New Middleware Home**.
   - For Middleware Home Directory, enter **MW_HOME**.

   Note: See Section 2.3, "Shared Storage and Recommended Directory Structure" for more information.

Click **Next**.

4. In the Register for Security Updates screen, enter your contact information so that you can be notified of security updates, and click **Next**.
5. In the Choose Install Type screen, select **Custom**, and click **Next**.
6. In the Choose Products and Components screen, click **Next**.
7. In the JDK Selection screen, select *only* **Oracle JRockit 1.6.0_<version> SDK**, and click **Next**.
8. In the Choose Product Installation Directories screen, accept the directory **WL_HOME**, and click **Next**.
9. In the Installation Summary screen, click **Next**.
10. In the Installation Complete screen, unselect **Run QuickStart**, and click **Done**.

4.1.2 Installing Oracle Fusion Middleware for WebCenter

Perform these steps to install Oracle Fusion Middleware for WebCenter on SOAHOST1, SOAHOST2, WCHOST1, and WCHOST2.

1. On Linux platforms, if the `/etc/oraInst.loc` file exists, check that its contents are correct. Specifically, check that the inventory directory is correct and that you have write permissions for that directory.

   If the `/etc/oraInst.loc` file does not exist, you can skip this step.

2. Start the installer for Oracle Fusion Middleware for WebCenter.

   ```
   SOAHOST1> runInstaller
   ```

   When the installer prompts you for a JRE/JDK location, enter the Oracle SDK location created in the Oracle WebLogic Server installation, for example, **MW_HOME/jrockit_160_<version>**.

3. In the Specify Inventory Directory screen, do the following:

   a. Enter `HOME/oraInventory`, where `HOME` is the home directory of the user performing the installation (this is the recommended location).

   b. Enter the OS group for the user performing the installation.

   c. Click **Next**.

   Follow the instructions on screen to execute `/createCentralInventory.sh` as root. Click **OK**.

4. In the Welcome screen, click **Next**.
5. In the Prerequisite Check screen, verify that the checks complete successfully, and click **Next**.
6. Specify the installation location. Select the previously installed Middleware Home from the drop-down list. For the Oracle Home directory, enter the directory name (**wc**).

   Click **Next**.

7. In the Application Server screen, select **WebLogic**.

   Click **Next**.

8. In the Installation Summary screen, click **Install**.

9. In the Installation Complete screen, click **Finish**.

4.2 Backing Up the Installation

The Fusion Middleware Home should be backed up now (make sure that you stop the server first):

```
SOAHOST1> tar -cvpf fmwhomeback.tar MW_HOME
```

This creates a backup of the installation files for both Oracle WebLogic Server and Oracle Fusion Middleware for WebCenter.

4.3 Enabling VIP1 in SOAHOST1

Please note that this step is required for failover of the Administration Server, regardless of whether or not SOA is installed.

You are associating the Administration Server with a virtual hostname (ADMINVHN). This Virtual Host Name must be mapped to the appropriate VIP (VIP1) either by a DNS Server or by a custom `/etc/hosts` entry. Check that ADMINVHN is available per your name resolution system, (DNS server, /etc/hosts), in the required nodes in your SOA topology. The VIP (VIP1) that is associated to this Virtual Host Name (ADMINVHN) must be enabled in SOAHOST1.

To enable the virtual IP on Linux, run the `ifconfig` command as root:

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

For example:

```
/sbin/ifconfig ethX:Y 100.200.140.206 netmask 255.255.255.0
```

Enable your network to register the new location of the virtual IP, for example:

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

Validate that the address is available by pinging it from another node, for example:

```
/bin/ping 100.200.140.206
```

In this example 'ethX' is the ethernet interface (eth0 or eth1) and Y is the index (0, 1, 2, etc.).

4.4 Running the Configuration Wizard on SOAHOST1 to Create a Domain

Run the Configuration Wizard from the WebCenter home directory to create a domain containing the Administration Server and Oracle Web Services Manager. Later, you will extend the domain to contain WebCenter components.

1. Ensure that the database where you installed the repository is running. For Oracle RAC databases, it is recommended that all instances are running, so that the validation check later on becomes more reliable.
2. Change directory to the location of the Configuration Wizard. This is within the WebCenter home directory.

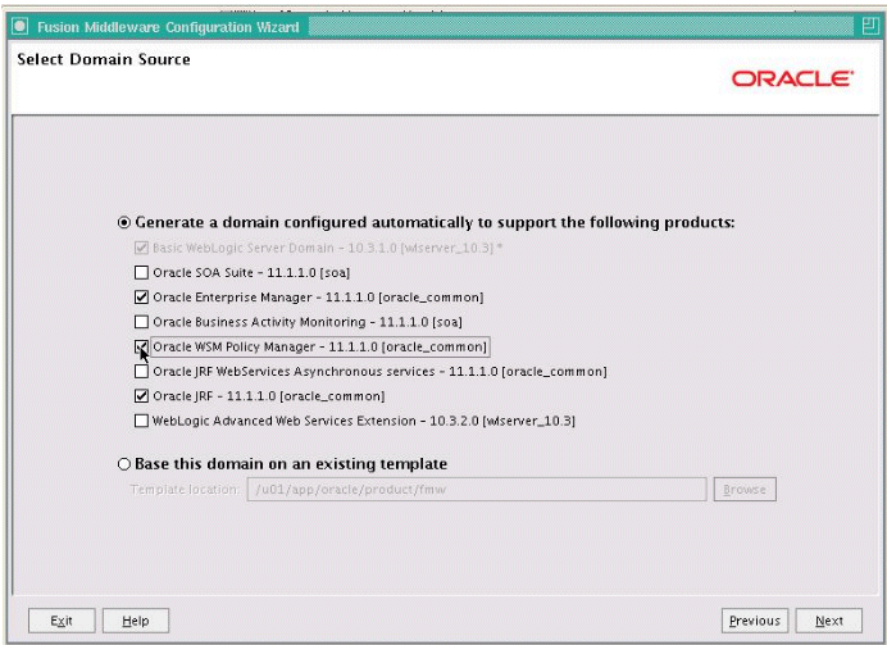
   ```
   SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
   ```

3. Start the Oracle Fusion Middleware Configuration Wizard:

```
SOAHOST1> ./config.sh
```

4. In the Welcome screen, select **Create a New WebLogic Domain**, and click **Next**.
5. The Select Domain Source screen is displayed (Figure 4–1).

Figure 4–1 Select Domain Source Screen



In the Select Domain Source screen, do the following:

- Select **Generate a domain configured automatically to support the following products**.
- Select the following products:
  - **Basic WebLogic Server Domain - 10.3.4.0 [wlserver_10.3][wc]** (this should be selected automatically)
  - **Oracle Enterprise Manager - 11.1.1.0 [oracle_common]**
  - **Oracle WSM Policy Manager 11.1.1.0 [oracle_common]**
  - **Oracle JRF - 11.1.1.0 [oracle_common]** (this should be selected automatically)

If you accidentally deselect some of the targets, make sure that the following selections are made in this screen:

- Oracle Enterprise Manager
- Oracle WSM Policy Manager
- Oracle JRF

Click **Next**.

> **Note:** If multiple Oracle Homes are installed (for example a WebCenter Home and a SOA Home), available products will show up for both homes. In this step, select only products from the WebCenter home (wc). This is indicated by brackets at the end of the product name; for example, "Oracle JRF - 11.1.1.0 [wc]."

6. In the Specify Domain Name and Location screen, enter the domain name (wcedg_domain).

   Make sure that the domain directory matches the directory and shared storage mount point recommended in Chapter 2, "Database and Environment Preconfiguration": enter `ORACLE_BASE/admin/<domain_name>/aserver` for the domain directory and `ORACLE_BASE/admin/<domain_name>/aserver/applications` for the application directory. This directory should be in shared storage.

7. Click **Next**.

8. In the Configure Administrator Username and Password screen, enter the username and password to be used for the domain's administrator.

   Click **Next**.

9. In the Configure Server Start Mode and JDK screen, do the following:

   - For WebLogic Domain Startup Mode, select **Production Mode**.
   - For JDK Selection, select **JROCKIT SDK1.6.0_<version>**.

   Click **Next**.

10. In the Configure JDBC Components Schema screen, do the following:

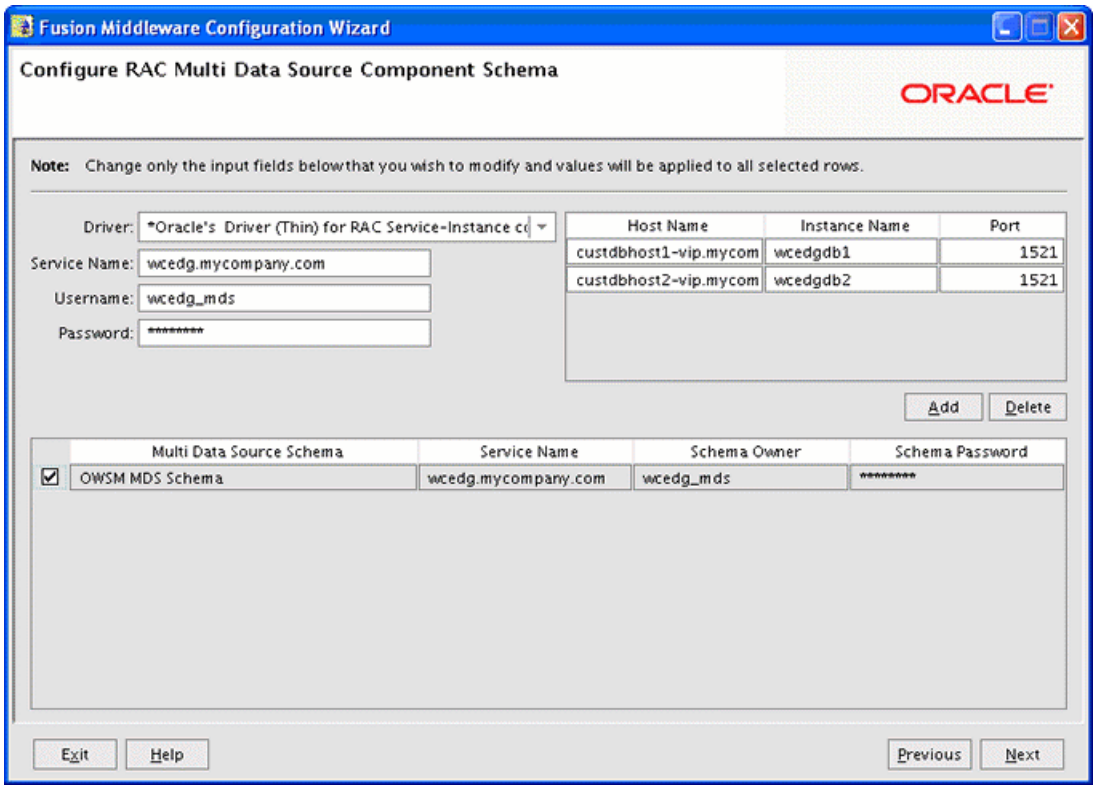
    a. Select the OWSM MDS schema.

    b. Select **Configure selected component schemas as RAC multi data source schemas in the next panel**.

    c. Click **Next**.

11. The Configure RAC Multi Data Sources Component Schema screen is displayed (Figure 4–2).

Figure 4–2 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, for example, `wcedg.mycompany.com`.
- **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**.

12. In the Test JDBC Data Sources screen, the connections should be 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.

13. In the Select Advanced Configuration screen, select the following:

- **Administration Server**

- **Managed Servers, Clusters and Machines**
- **Deployment and Services**

Click **Next**.

14. In the Configure the Administration Server screen, enter the following values:
    - Name: **AdminServer**
    - Listen Address: enter ADMINVHN.
    - Listen Port: **7001**
    - SSL listen port: **N/A**
    - SSL enabled: **unchecked**

    Click **Next**.
15. In the Configure Managed Servers screen, click **Add** to add the following managed servers:

Table 4–1 Managed Servers

Name	Listen Address	Listen Port	SSL Listen Port	SSL Enabled
WLS_WSM1	SOAHOST1	7010	n/a	No
WLS_WSM2	SOAHOST2	7010	n/a	No

Click **Next**.

16. In the Configure Clusters screen, Click **Add** to add the following clusters:

Table 4–2 Clusters

Name	Cluster Messaging Mode	Multicast Address	Multicast Port	Cluster Address
WSM-PM_Cluster	unicast	n/a	n/a	Leave it empty.

Click **Next**.

17. In the Assign Servers to Clusters screen, assign servers to clusters as follows:
    - **WSM-PM_Cluster:**
      - WLS_WSM1
      - WLS_WSM2

    Click **Next**.
18. In the Configure Machines screen, do the following:
    - Click the **Unix Machine** tab and then click **Add** to add the following machines:

Note: "Name" can be any unique string. "Node Manager Listen Address" must be a resolvable host name.

Table 4–3 Machines

Name	Node Manager Listen Address
SOAHOST1	SOAHOST1
SOAHOST2	SOAHOST2

Leave all other fields to their default values.

Click **Next**.

19. In the Assign Servers to Machines screen, assign servers to machines as follows:
    - **SOAHOST1:**
      - AdminServer
      - WLS_WSM1
    - **SOAHOST2:**
      - WLS_WSM2

    Click **Next**.
20. In the **Target Deployments to Clusters or Servers** screen, make sure that the **wsm-pm** application and the **oracle.wsm.seedpolicies** library is targeted to the **WSM-PM_Cluster** only. Make sure that all other deployments are targeted to the **AdminServer**. Click **Next**.
21. In the **Target Services to Clusters or Servers** screen, select the following:
    - On the left, select **WSM-PM_Cluster**. On the right, select **JDBC System Resource** (this automatically selects all the wsm datasources (mds-owsm)).
    - On the left, select **Admin Server**. On the right, select **JDBC System Resource** (this automatically selects all the wsm datasources (mds-owsm)).

    All JDBC system resources should be targeted to both the Admin Server and WSM-PM_Cluster.
    - On the left, select **WSM-PM_Cluster**. On the right, select **JOC-Shutdown**, and **JOC-Startup**.
    - On the left, select **Admin Server**. On the right, deselect **JOC-Shutdown** and **JOC-Startup**. Make sure these services are not targeted to the Admin Server.

    JOC-Shutdown, and **JOC-Startup** should be targeted only to the **WSM-PM_Cluster**.
    - Make sure that all the remaining services are targeted to the **Admin Server**.
    - Click **Next**.
22. In the Configuration Summary screen, click **Create**.
23. In the Create Domain screen, click **Done**.

4.5 Creating boot.properties for the Administration Server on SOAHOST1

Create a `boot.properties` file for the Administration Server on SOAHOST1. The `boot.properties` file enables the Administration Server to start without prompting you for the administrator username and password.

For the Administration Server:

1. Create the following directory structure:

```
mkdir -p ORACLE_BASE/admin/domain_name/aserver/domain_
name/servers/AdminServer/security
```

2. In a text editor, create a file called `boot.properties` in the last directory created in the previous step, and enter the following lines in the file:

```
username=<adminuser>
password=<password>
```

> **Note:** When you start the Administration Server, the username and password entries in the file get encrypted. You start the Administration Server in Section 4.7, "Starting the Administration Server on SOAHOST1."
>
> For security reasons, you want to minimize the 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.

4.6 Starting Node Manager on SOAHOST1

Perform these steps to start Node Manager on SOAHOST1:

1. Run the *setNMProps.sh* script, which is located in the *ORACLE_COMMON_HOME/common/bin* directory, to set the `StartScriptEnabled` property to 'true' before starting Node Manager:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
SOAHOST1> ./setNMProps.sh
```

> **Note:** You must use the `StartScriptEnabled` property to avoid class loading failures and other problems.

2. Start Node Manager:

```
SOAHOST1> cd WL_HOME/server/bin
SOAHOST1> export JAVA_OPTIONS="-DDomainRegistrationEnabled=true"
SOAHOST1> ./startNodeManager.sh
```

> **Note:** It is important that you set `-DDomainRegistrationEnabled=true` whenever a Node Manager is started that must manage the AdminServer. This is due to the fact that the AdminServer domain home does not exist in the NodeManager Domains file and you must use dynamic registration of the domain. Oracle does not recommend using this parameter except in the case specified here.
>
> If there is no AdminServer on this machine and this machine is not an AdminServer failover node, you should start the Node Manager as:
>
> ```
> SOAHOST1> ./startNodeManager.sh
> ```

4.7 Starting the Administration Server on SOAHOST1

The Administration Server is started and stopped using Node Manager. However, the first start of the Administration Server with Node Manager, requires changing the defaulted username and password that are set for Node Manager by the Configuration Wizard. Therefore, use the start script for the Administration Server for the first start.

Follow these steps to start the Administration Server using Node Manager (steps 1-4 are required for the first start operation, subsequent starts require only step 4):

1. Start the Administration Server using the start script in the domain directory

   ```
   SOAHOST1> cd ORACLE_BASE/admin/domain_name/aserver/domain_name/bin
   SOAHOST1> ./startWebLogic.sh
   ```

2. Use the Administration Console to update the Node Manager credentials.
   a. In a browser, go to the following URL;

      ```
      http://ADMINVHN:7001/console
      ```

   b. Log in as the administrator.
   c. Click **Lock and Edit**.
   d. Click **domain_name**, **Security**, **General**, and then expand the **Advanced** options at the bottom.
   e. Enter a new username for Node Manager, or make a note of the existing one and update the Node Manager password.
   f. Save and activate the changes.
3. Stop the Administration Server process by using **CTRL-C** in the shell where it was started, or by process identification and kill in the OS.
4. Start WLST and connect to Node Manager with **nmconnect** and the credentials set in the previous steps and start the Administration Server using **nmstart**.

   ```
   SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
   SOAHOST1> ./wlst.sh
   ```

   Once you are in the WLST shell:

   ```
   wls:/offline>nmConnect('Admin_User','Admin_Password',
   'SOAHOST1','5556','domain_name','/u01/app/oracle/admin/domain_
   name/aserver/domain_name')

   wls:/nm/domain_name> nmStart('AdminServer')
   ```

> **Note:** This username and password are used only to authenticate connections between Node Manager and clients. They are independent of the server admin ID and password and are stored in the *ORACLE_BASE*/admin/*domain_name*/aserver/*domain_name*/config/nodemanager/nm_password.properties file.

4.8 Validating the Administration Server

Perform these steps to ensure that the Administration Server is properly configured:

1. In a browser, go to `http://ADMINVHN:7001/console`.

2. Log in as the administrator.
3. Verify that the WLS_WSM1 and WLS_WSM2 managed servers are listed.
4. Verify that the WSM-PM_Cluster cluster is listed.
5. Check that you can access Oracle Enterprise Manager at `http://ADMINVHN:7001/em`.
6. Log in to EM Console with the username and password you specified in Section 4.5, "Creating boot.properties for the Administration Server on SOAHOST1."

4.9 Creating a Separate Domain Directory for Managed Servers in the Same Node as the Administration Server

Use the `pack` and `unpack` commands to separate the domain directory used by the Administration Server from the domain directory used by the managed server in SOAHOST1as recommended in Chapter 2, "Database and Environment Preconfiguration."

1. Run the pack command on SOAHOST1 to create a template pack as follows:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin

SOAHOST1> ./pack.sh -managed=true -domain=ORACLE_BASE/admin/domain_
name/aserver/domain_name -template=soadomaintemplate.jar -template_name=soa_
domain_template
```

2. Run the unpack command on SOAHOST1 to unpack the template in the managed server domain directory as follows:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin

SOAHOST1> ./unpack.sh -domain=ORACLE_BASE/admin/domain_name/mserver/domain_name
-template=soadomaintemplate.jar -app_dir=ORACLE_BASE/admin/domain_
name/mserver/applications
```

4.10 Applying the Java Required Files (JRF) Template to the WSM-PM_Cluster

After the domain is created with the Configuration Wizard, you must target a number of resources not included in the WebLogic server installation to the WSM-PM Cluster.

To target these resources:

1. Log in to Oracle Enterprise Manager Fusion Middleware Control with the username and password you specified in Section 4.5, "Creating boot.properties for the Administration Server on SOAHOST1."
2. On the navigation tree on the left, expand **Farm_<domain_name>**, **WebLogic Domain**, and then **<domain_name>**, and select **WSM_PM_Cluster**.
3. Click **Apply JRF Template** on the right.
4. Wait for the confirmation message to appear on the screen.

   This message should confirm that the JRF Template has been successfully applied to the WSM-PM_Cluster cluster.

4.11 Disabling Host Name Verification for the Oracle WebLogic Administration Server and the WLS_WSM1 Managed Server

This step is required if you have not set up the appropriate certificates to authenticate the different nodes with the Administration Server (see Chapter 7, "Setting Up Node Manager"). If you have not configured the server certificates, you will receive errors when managing the different WebLogic Servers. To avoid these errors, disable host name verification while setting up and validating the topology, and enable it again once the Enterprise Deployment topology configuration is complete as described in Chapter 7, "Setting Up Node Manager."

Perform these steps to disable host name verification:

1. Log in to Oracle WebLogic Server Administration Console.
2. Click **Lock and Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page appears.
5. Select **AdminServer(admin)** in the Names column of the table. The Settings page for AdminServer(admin) appear.
6. Click the **SSL** tab.
7. Click **Advanced**.
8. Set Hostname Verification to **None**.
9. Click **Save**.
10. Repeat steps 4 to 8 for the WLS_WSM1 server.
11. Save and activate the changes.
12. The change requires restart of the Administration Server to be effective. To do this, complete these steps:
    a. In the Summary of Servers screen, select the **Control** tab.
    b. Select **AdminServer(admin)** in the table and then click **Shutdown**.
    c. Start the Administration Server again using the procedure in Section 4.7, "Starting the Administration Server on SOAHOST1."

4.12 Starting and Validating the WLS_WSM1 Managed Server

Perform these steps to start the WLS_WSM1 managed server and check that it is configured correctly:

1. Start the WLS_WSM1 managed server using the Oracle WebLogic Server Administration Console as follows:
    a. Expand the **Environment** node in the Domain Structure window.
    b. Choose **Servers**. The Summary of Servers page appears.
    c. Click the **Control** tab.
    d. Select **WLS_WSM1** and then click **Start**.
2. Verify that the server status is reported as "Running" in the Admin 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. See Section 11.6, "Troubleshooting" for possible causes.

3. Access `http://SOAHOST1:7010/wsm-pm`.
4. Click **Validate Policy Manager**. A list of policies and assertion templates available in the data store appear.

> **Note:** The configuration is incorrect if no policies or assertion templates appear.

4.13 Propagating the Domain Configuration to SOAHOST2 Using the unpack Utility

Perform these steps to propagate the domain configuration:

1. Run the following command on SOAHOST1 to copy the template file created previously.

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
SOAHOST1> scp soadomaintemplate.jar oracle@SOAHOST2:/ORACLE_COMMON_
HOME/common/bin
```

2. Run the `unpack` command on SOAHOST2 to unpack the propagated template.

> **Note:** Run `unpack` from the `ORACLE_HOME/common/bin` directory, not from the `WL_HOME/common/bin` directory.

```
SOAHOST2> cd ORACLE_COMMON_HOME/common/bin

SOAHOST2> ./unpack.sh -domain=ORACLE_BASE/admin/domain_name/mserver/domain_name
-template=soadomaintemplate.jar -app_dir=ORACLE_BASE/admin/domain_
name/mserver/applications
```

> **Note:** The `ORACLE_BASE/admin/<domain_name>/mserver` directory must exist before running `unpack`.

4.14 Disabling Host Name Verification for the WLS_WSM2 Managed Server

This step is required if you have not set up the appropriate certificates to authenticate the different nodes with the Administration Server (see Chapter 7, "Setting Up Node Manager"). If you have not configured the server certificates, you will receive errors when managing the different WebLogic Servers. To avoid these errors, disable host name verification while setting up and validating the topology, and enable it again once the Enterprise Deployment topology configuration is complete as described in Chapter 7, "Setting Up Node Manager."

Perform these steps to disable host name verification:

1. Log in to Oracle WebLogic Server Administration Console.
2. Click **Lock and Edit**.
3. Expand the **Environment** node in the Domain Structure window.

4. Click **Servers**. The Summary of Servers page appears.
5. Select **WLS_WSM2** in the Names column of the table. The Settings page for AdminServer(admin) appear.
6. Click the **SSL** tab.
7. Click **Advanced**.
8. Set Hostname Verification to **None**.
9. Save and activate the changes.

4.15 Starting Node Manager on SOAHOST2

Perform these steps to start Node Manager on SOAHOST2:

1. Run the *setNMProps.sh* script, which is located in the *ORACLE_COMMON_HOME/common/bin* directory, to set the `StartScriptEnabled` property to 'true' before starting Node Manager:

```
SOAHOST2> cd ORACLE_COMMON_HOME/common/bin
SOAHOST2> ./setNMProps.sh
```

> **Note:** You must use the `StartScriptEnabled` property to avoid class loading failures and other problems.

2. Start Node Manager:

```
SOAHOST2> cd WL_HOME/server/bin
SOAHOST2> ./startNodeManager.sh
```

4.16 Starting and Validating the WLS_WSM2 Managed Server

Perform these steps to start the WLS_WSM2 managed server and check that it is configured correctly:

1. Start the WLS_WSM2 managed server using the Administration Console.
2. Verify that the server status is reported as "Running" in the Admin 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. See Section 11.6, "Troubleshooting" for possible causes.
3. Access `http://SOAHOST2:7010/wsm-pm`.
4. Click validate policy manager.

4.17 Configuring the Java Object Cache for Oracle WSM

The Java Object Cache (JOC) should be configured among all the servers running Oracle WSM. This local cache is provided to increase the performance of Oracle WSM.

The Java Object Cache can be configured using the `MW_HOME/oracle_common/bin/configure-joc.py` script. This is a Python script which can be used to configure JOC in the managed servers. The script runs in WLST online mode and expects the Administration Server to be up and running.

When configuring JOC ports for Oracle products, Oracle recommends using ports in the 9988 to 9998 range.

> **Note:** After configuring the Java Object Cache using the wlst commands or *configure-joc.py* script, all affected managed servers should be restarted for the configurations to take effect.

Usage

1. Connect to the Administration Server using the command-line Oracle WebLogic Scripting Tool (WLST), for example:

   ```
   MW_HOME/wc/common/bin/wlst.sh
   $ connect()
   ```

   Enter the Oracle WebLogic Administration user name and password when prompted.

2. After connecting to the Administration Server using `wlst`, start the script using the `execfile` command, for example:

   ```
   wls:/mydomain/serverConfig>execfile('MW_HOME/oracle_
   common/bin/configure-joc.py')
   ```

3. Configure JOC for all the managed servers for a given cluster.

   Enter 'y' when the script prompts whether you want to specify a cluster name, and also specify the cluster name and discover port, when prompted. This discovers all the managed servers for the given cluster and configure the JOC. The discover port is common for the entire JOC configuration across the cluster. For example:

   ```
   Do you want to specify a cluster name (y/n) <y>
   Enter Cluster Name : wsm-pm_cluster
   Enter Discover Port : 9991
   ```

   Here is a walkthrough for using `configure-joc.py` for HA environments:

   ```
   execfile('MW_HOME/oracle_common/bin/configure-joc.py')
   .
   Enter Hostnames (eg host1,host2) : SOAHOST1, SOAHOST2
   .
   Do you want to specify a cluster name (y/n) <y>y
   .
   Enter Cluster Name : wsm-pm_cluster
   .
   Enter Discover Port : 9991
   .
   Enter Distribute Mode (true|false) <true> : true
   .
   Do you want to exclude any server(s) from JOC configuration (y/n) <n> n
   ```

The script can also be used to perform the following JOC configurations:

- Configure JOC for all specified managed servers.

  Enter 'n' when the script prompts whether you want to specify a cluster name, and also specify the managed server and discover port, when prompted. For example:

  ```
  Do you want to specify a cluster name (y/n) <y>n
  Enter Managed Server and Discover Port (eg WLS_WSM1:9998, WLS_WSM1:9998) : WLS_
  WSM1:9991,WLS_WSM2:9991
  ```

- Exclude JOC configuration for some managed servers.

  The script allows you to specify the list of managed servers for which the JOC configuration "DistributeMode" will be set to 'false'. Enter 'y' when the script prompts whether you want to exclude any servers from JOC configuration, and enter the managed server names to be excluded, when prompted. For example:

  ```
  Do you want to exclude any server(s) from JOC configuration (y/n) <n>y
  Exclude Managed Server List (eg Server1,Server2) : WLS_WSM1,WLS_WSM3
  ```

- Disable the distribution mode for all managed servers.

  The script allows you to disable the distribution to all the managed servers for a specified cluster. Specify 'false' when the script prompts for the distribution mode. By default, the distribution mode is set to 'true'.

Verify JOC configuration using the CacheWatcher utility. See *Oracle Fusion Middleware High Availability Guide*.

You can configure the Java Object Cache (JOC) using the **HA Power Tools** tab in the Oracle WebLogic Administration Console as described in the *Oracle Fusion Middleware High Availability Guide*.

4.18 Configuring Oracle HTTP Server for the Administration Server and the WLS_WSM-PM*n* Managed Servers

To enable Oracle HTTP Server to route to the Administration Server and the WSM-PM_Cluster, which contain the WLS_WSM-PM*n* managed servers, you must set the `WebLogicCluster` parameter to the list of nodes in the cluster:

1. On WEBHOST1 and WEBHOST2, add the following lines to the *ORACLE_BASE*/admin/*instance_name*/config/OHS/*component_name*/mod_wl_ohs.conf file:

```
# The admin URLs should only be accessible via the admin virtual host

NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName admin.mycompany.com:80
    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>

# Virtual host entry for external https URL configured at the Load Balancer

NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName https://wc.mycompany.com:443
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit

# WSM-PM
<Location /wsm-pm>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1:7010,SOAHOST2:7010
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

</VirtualHost>

# Virtual host entry for internal http URL

NameVirtualHost *:7777
<VirtualHost *:7777>
    ServerName wcinternal.mycompany.com:80
    ServerAdmin you@your.address
    RewriteEngine On
    RewriteOptions inherit

</VirtualHost>
```

Note: Values such as `7777`, `admin.mycompany.com:80`, and `you@your.address` that are noted in this document serve as examples only. Enter values based on the actual environment.

2. Restart Oracle HTTP Server on both WEBHOST1 and WEBHOST2.

```
WEBHOST1> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
ias-component=ohs1

WEBHOST2> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
ias-component=ohs2
```

The servers specified in the `WebLogicCluster` parameter are only important at startup time for the plug-in. The list needs to provide at least one running cluster member for the plug-in to discover other members of the cluster. Note that the listed cluster member must be running when Oracle HTTP Server is started. Oracle WebLogic Server and the plug-in work together to update the server list automatically with new, failed, and recovered cluster members.

Some example scenarios:

- Example 1: If you have a two-node cluster and then add a third member, you do not need to update the configuration to add the third member. The third member will be discovered on the fly at runtime.

- Example 2: You have a three-node cluster but only two nodes are listed in the configuration. However, if both listed nodes are down when you start Oracle HTTP Server, then the plug-in would fail to route to the cluster. You must ensure that at least one of the listed nodes is running when you start Oracle HTTP Server.

  If you list all members of the cluster, then you guarantee you can route to the cluster, assuming at least one member is running when Oracle HTTP Server is started.

For more information on configuring the WebLogic Server plug-in, see the *Oracle Fusion Middleware Using Web Server Plug-Ins with Oracle WebLogic Server* guide.

Important Security Consideration

For security purposes, and since the load balancer terminates SSL request (Oracle HTTP Server routes the requests as non-SSL to WebLogic Server), once SSL is configured for the load balancer, turn on the WebLogic plug-in enabled flag2 for the domain. To do this, follow these steps:

1. Log on to the Administration Console.
2. Click on the domain name in the navigation tree on the left.
3. Click on the **Web Applications** tab.
4. Click **Lock and Edit**.
5. Select the **WebLogic Plugin Enabled** check box.
6. Save and activate the changes.

4.19 Registering Oracle HTTP Server With WebLogic Server

Once an Oracle WebLogic domain is created, the Oracle Web Tier can be linked to the domain. The advantages of doing this is that the Oracle Web Tier can be managed and monitored using the Oracle Fusion Middleware Console.

To associate the Oracle Web Tier with the WebLogic domain use the following commands:

```
WEBHOST1> cd ORACLE_BASE/admin/<instance_name>/bin

WEBHOST1> ./opmnctl registerinstance -adminHost ADMINVHN -adminPort 7001
-adminUsername weblogic
```

You must also run this command from WEBHOST2 for OHS2.

4.20 Setting the Frontend URL for the Administration Console and Setting Redirection Preferences

When you access the Oracle WebLogic Server Administration Console using a load balancer, changing the Administration Server's frontend URL is required so that the user's browser is redirected to the appropriate load balancer address. To change the Administration Server's frontend URL, complete these steps:

1. Log in to Oracle WebLogic Server Administration Console.
2. Click **Lock and Edit**.
3. Expand the Environment node in the Domain Structure window.
4. Click **Servers** to open the Summary of Servers page.

5. Select **Admin Server** in the Names column of the table. The Settings page for AdminServer(admin) appear.
6. Click the Protocols tab.
7. Click the HTTP tab.
8. Set the **Front End Host** field to `admin.mycompany.com` (your load balancer address).
9. Save and activate the changes.

Note: Oracle also recommends disabling tracking on configuration changes in the Oracle WebLogic Server Administration Console so that the console does not trigger the reload of configuration pages when activation of changes occurs. To disable the reload, log in to the Oracle WebLogic Server Administration Console, click the **preferences** link in the banner, and then the **shared preferences** tab. Deselect the **follow configuration changes** checkbox.

Note: If you have any issues activating any configuration changes after modifying the Frontend Host and Port settings, then refer to Section 11.6.5, "Redirecting of Users to Login Screen After Activating Changes in Administration Console."

4.21 Validating Access Through Oracle HTTP Server

Verify that the server status is reported as "Running" in the Admin 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. See Section 11.6, "Troubleshooting" for possible causes.

Validate wsm-pm_cluster through both Oracle HTTP Server using the following URLs:

- `http://WEBHOST_node1:7777/wsm-pm`
- `http://WEBHOST_node2:7777/wsm-pm`
- `http://WEBHOST_node1:7777/console`
- `http://WEBHOST_node2:7777/console`
- `http://WEBHOST_node1:7777/em`
- `http://WEBHOST_node2:7777/em`
- `https://wcinternal.mycompany.com/wsm-pm`
- `http://admin.mycompany.com/console`
- `http://admin.mycompany.com/em`

For information on configuring system access through the load balancer, see Section 2.2.2, "Load Balancers."

Note: After the registering Oracle HTTP Server as described in Section 4.19, "Registering Oracle HTTP Server With WebLogic Server," the Oracle HTTP Server should appear as a manageable target in the Oracle Enterprise Manager Console. To verify this, log into the Enterprise Manager Console. The WebTier item in the navigation tree should show that Oracle HTTP Server has been registered.

4.22 Manually Failing Over the Administration Server to SOAHOST2

In case a node fails, you can fail over the Administration Server to another node. This section describes how to fail over the Administration Server from SOAHOST1 to SOAHOST2.

Assumptions:

- The Administration Server is configured to listen on ADMINVHN, and not on ANY address. See step 14 in Section 4.4, "Running the Configuration Wizard on SOAHOST1 to Create a Domain".
- These procedures assume that the two nodes use two individual domain directories, and that the directories reside in local storage or in shared storage in different volumes.
- The Administration Server is failed over from SOAHOST1 to SOAHOST2, and the two nodes have these IPs:
  - SOAHOST1: 100.200.140.165
  - SOAHOST2: 100.200.140.205
  - VIPHOST1: 100.200.140.206. This is the VIP where the Administration Server is running, assigned to ethX:Y, available in SOAHOST1 and SOAHOST2.
- The domain directory where the Administration Server is running in SOAHOST1 is on a shared storage and is mounted also from SOAHOST2.

The following procedure shows how to fail over the Administration Server to a different node (SOAHOST2), but the Administration Server will still use the same WebLogic Server machine (which is a logical machine, not a physical machine).

1. Stop the Administration Server.
2. Migrate IP to the second node.
   a. Run the following command as root on SOAHOST1 (where X:Y is the current interface used by ADMINVHN):

      ```
      SOAHOST1> /sbin/ifconfig ethX:Y down
      ```

   b. Run the following command on SOAHOST2:

      ```
      SOAHOST2> /sbin/ifconfig <interface:index> <IP_Address> netmask <netmask>
      ```

      For example:

      ```
      /sbin/ifconfig eth0:1 10.0.0.1 netmask 255.255.255.0
      ```

Note: Ensure that the netmask and interface to be used to match the available network configuration in SOAHOST2.

3. Update routing tables through `arping`, for example:

```
SOAHOST2> /sbin/arping -b -A -c 3 -I eth0 10.0.0.1
```

4. Start the Administration Server on SOAHOST2 using the procedure inSection 4.7, "Starting the Administration Server on SOAHOST1.".

5. Test that you can access the Administration Server on SOAHOST2 as follows:

   a. Ensure that you can access the Oracle WebLogic Server Administration Console at `http://ADMINVHN:7001/console`.

   b. Check that you can access and verify the status of components in the Oracle Enterprise Manager at `http://ADMINVHN:7001/em`.

Note: The Administration Server does not use Node Manager for failing over. After a manual failover, the machine name that appears in the **Current Machine** field in the Administration Console for the server is SOAHOST1, and not the failover machine, SOAHOST2. Since Node Manager does not monitor the Administration Server, the machine name that appears in the **Current Machine** field, is not relevant and you can ignored it.

4.23 Validating Access to SOAHOST2 Through Oracle HTTP Server

Perform the same steps as in Section 4.21, "Validating Access Through Oracle HTTP Server". This is to check that you can access the Administration Server when it is running on SOAHOST2.

4.24 Failing the Administration Server Back to SOAHOST1

This step checks that you can fail back the Administration Server, that is, stop it on SOAHOST2 and run it on SOAHOST1. To do this, migrate ADMINVHN back to SOAHOST1 node as follows:

1. Stop the Administration Server.

2. Run the following command on SOAHOST2.

```
SOAHOST2> /sbin/ifconfig ethZ:N down
```

3. Run the following command on SOAHOST1:

```
SOAHOST1> /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 SOAHOST1

---

4. Update routing tables through arping. Run the following command from SOAHOST1.

```
SOAHOST1> /sbin/arping -b -A -c 3 -I ethZ 100.200.140.206
```

5. Start the Administration Server again on SOAHOST1 using the procedure in Section 4.7, "Starting the Administration Server on SOAHOST1.".

```
SOAHOST1> cd ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/bin
```

```
SOAHOST1> ./startWebLogic.sh
```

6. Test that you can access the Oracle WebLogic Server Administration Console at `http://ADMINVHN:7001/console`.
7. Check that you can access and verify the status of components in the Oracle Enterprise Manager at `http://ADMINVHN:7001/em`.

4.25 Backing Up the Installation

Perform a backup to save your domain configuration (make sure that you stop the server first). The configuration files all exist under the `ORACLE_BASE/admin/<domain_name>` directory.

```
SOAHOST1> tar -cvpf edgdomainback.tar ORACLE_BASE/admin/<domain_name>
```

Back up the Instance Home on the web tier using the following command:

```
tar -cvpf BACKUP_LOCATION/web_instance_name.tar ORACLE_INSTANCE
```

5

Extending the Domain for SOA Components

This chapter describes how to use the Configuration Wizard to extend the domain to include SOA components. You created in the domain in Chapter 4, "Creating a Domain."

Important: **Oracle strongly recommends that you read the release notes for any additional installation and deployment considerations prior to starting the setup process.**

Note: Follow the steps in this chapter only if you want to run SOA components on SOAHOST1 and SOAHOST2. If you do not want to run SOA components in your WebCenter topology, you can skip this chapter.

This chapter contains the following sections:

- Section 5.15, "Configuring Oracle HTTP Server for the WLS_SOAn Managed Servers"
- Section 5.16, "Validating Access Through Oracle HTTP Server"
- Section 5.17, "Setting the Frontend HTTP Host and Port"
- Section 5.18, "Setting the WLS Cluster address for Direct Binding/RMI invocations to composites"
- Section 5.19, "Configuring a Shared JMS Persistence Store"
- Section 5.20, "Configuring a Default Persistence Store for Transaction Recovery"
- Section 5.21, "Enabling High Availability for Oracle File and FTP Adapters"
- Section 5.22, "Scaling the Oracle Database Adapter"
- Section 5.23, "Backing Up the Installation"

5.1 Installing Oracle Fusion Middleware for SOA Home

You must install Oracle Fusion Middleware for SOA on both SOAHOST1 and SOAHOST2. These nodes will run managed servers configured with SOA components.

1. Start the installer for Oracle Fusion Middleware for SOA.

   ```
   SOAHOST1> runInstaller
   ```

   When the installer prompts you for a JRE/JDK location enter the Oracle SDK location created in the Oracle WebLogic Server installation, for example, **MW_HOME/jrockit_160_<version>**.

2. In the Welcome screen, click **Next**.
3. In the Prerequisite Check screen, verify that the checks complete successfully, and click **Next**.
4. Specify the installation location. Select the previously installed Middleware Home from the drop-down list. For the Oracle Home directory, enter the directory name (soa).

   Click **Next**.

5. In the Installation Summary screen, click **Install**.
6. In the Installation Complete screen, click **Finish**.

5.2 Enabling VIP2 on SOAHOST1 and VIP3 on SOAHOST2

The SOA domain uses virtual hostnames as the listen addresses for the SOA managed servers. You must enable A VIP mapping each of these hostnames on the two SOA Machines, (VIP2 on SOAHOST1 and VIP3 on SOAHOST2), and must be correctly resolve the virtual hostnames in the network system used by the topology (either by DNS Server, hosts resolution).

To enable the VIP, follow the steps described in Section 4.3, "Enabling VIP1 in SOAHOST1."These VIPs and VHNs are required to enable server migration for the SOA Servers. Server migration must be configured for the SOA System for high availability purposes. Refer to Chapter 9, "Server Migration" of the *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle SOA Suite* for more details on configuring server migration for the SOA servers.

5.3 Extending the Domain for SOA Components

In this step, you extend the domain created in Chapter 4, "Creating a Domain" to contain SOA components. In this section we are assuming that the SOA deployment uses the same database service (wcedg.mycompany.com) as the WebCenter deployment. However, a deployment may choose to use a different database service specifically for SOA such as *soaedg.mycompany.com*.

Note: You must back up the current domain before extending the domain. You may use the backup to recover in case any errors were made in the domain extension. See *Oracle Fusion Middleware Administrator's Guide*.

Note: Oracle SOA uses Quartz to maintain its jobs and schedules in the database. The system clocks for the SOA WebLogic cluster must be synchronized to enable Quartz jobs to run correctly across the cluster.

---

1. Change directory to the location of the Configuration Wizard. This is within the SOA home directory. (It is recommended that all database instances should be up.)

   ```
   SOAHOST1> cd ORACLE_HOME/common/bin
   ```

2. Start the Configuration Wizard.

   ```
   SOAHOST1> ./config.sh
   ```

3. In the Welcome screen, select **Extend an existing WebLogic domain**, and click **Next**.
4. In the WebLogic Domain Directory screen, select the WebLogic domain directory (`ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>`), and click **Next**.
5. In the Select Extension Source screen, do the following:
   - Select **Extend my domain automatically to support the following added products**.
   - Select the following products:
     - **Oracle SOA Suite 11.1.1.0**

       The following products should already be selected, and grayed out. They were selected when you created in domain in Section 4.4, "Running the Configuration Wizard on SOAHOST1 to Create a Domain."

     - Basic WebLogic Server Domain
     - Oracle Enterprise Manager
     - Oracle WSM Policy Manager
     - Oracle JRF

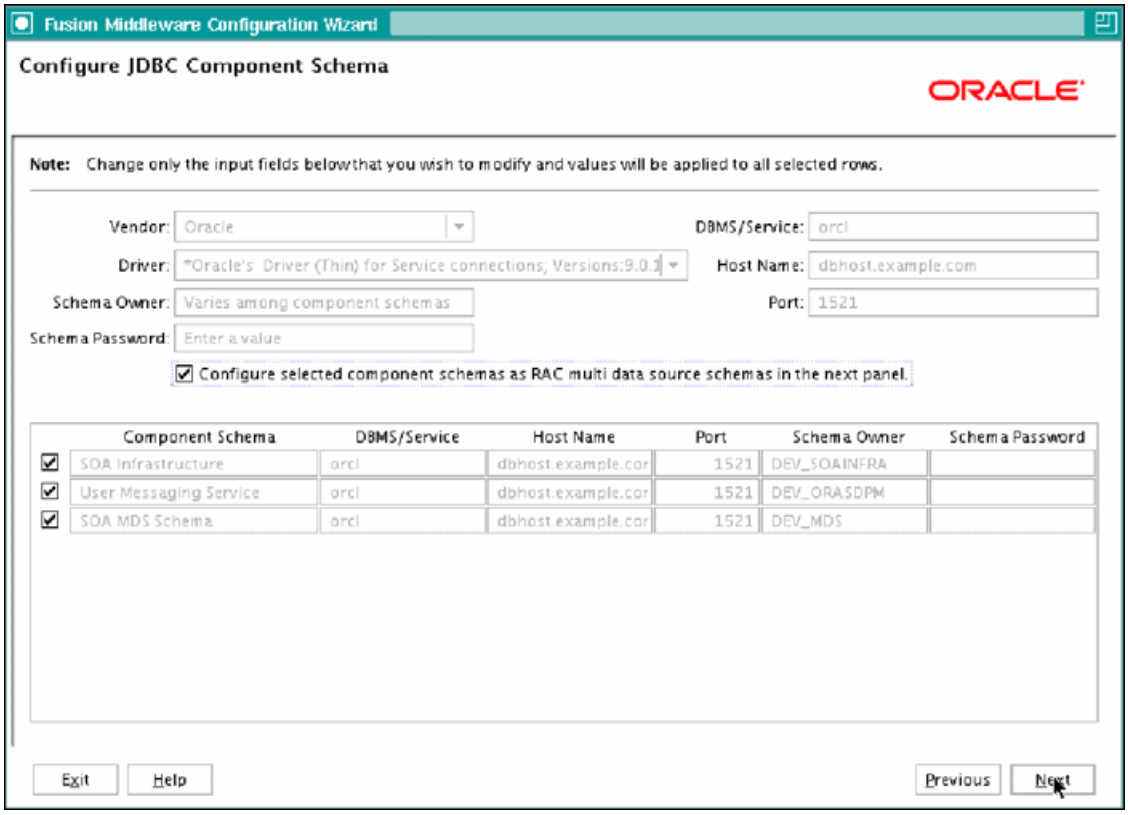
   Click **Next**.
6. If you get a "Conflict Detected" message that Oracle JRF is already defined in the domain, select the **Keep Existing Component** option and click **OK**.
7. In the Configure JDBC Component Schema screen (Figure 5–1), do the following:

a. Select the **SOA Infrastructure**, **User Messaging Service**, and **SOA MDS Schema** rows in the table.

b. Select **Configure selected component schemas as RAC multi data source schemas in the next panel.**

c. Click **Next**.

Figure 5–1 Configure JDBC Component Schema Screen



8. In the Configure RAC Multi Data Source Component Schema screen (Figure 5–2), do the following:

a. Select **SOA Infrastructure**.

b. Enter values for the following fields, specifying the connect information for the 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; for example, `wcedg.mycompany.com`.
- **Username:** Enter the complete user name (including prefix) for the schemas. The user names shown in Figure 5–2 assume that `soedg` was used as prefix for schema creation from RCU.
- **Password:** Enter the password to use to access the schemas.

c. Click **Add** and enter the details for the first RAC instance.

d. Repeat for each RAC instance.

e. Deselect **SOA Infrastructure**.

f. Select **User Messaging Service**.

g. Repeat steps b, c, and d for the User Messaging Schema.

h. Deselect **User Messaging Service**.

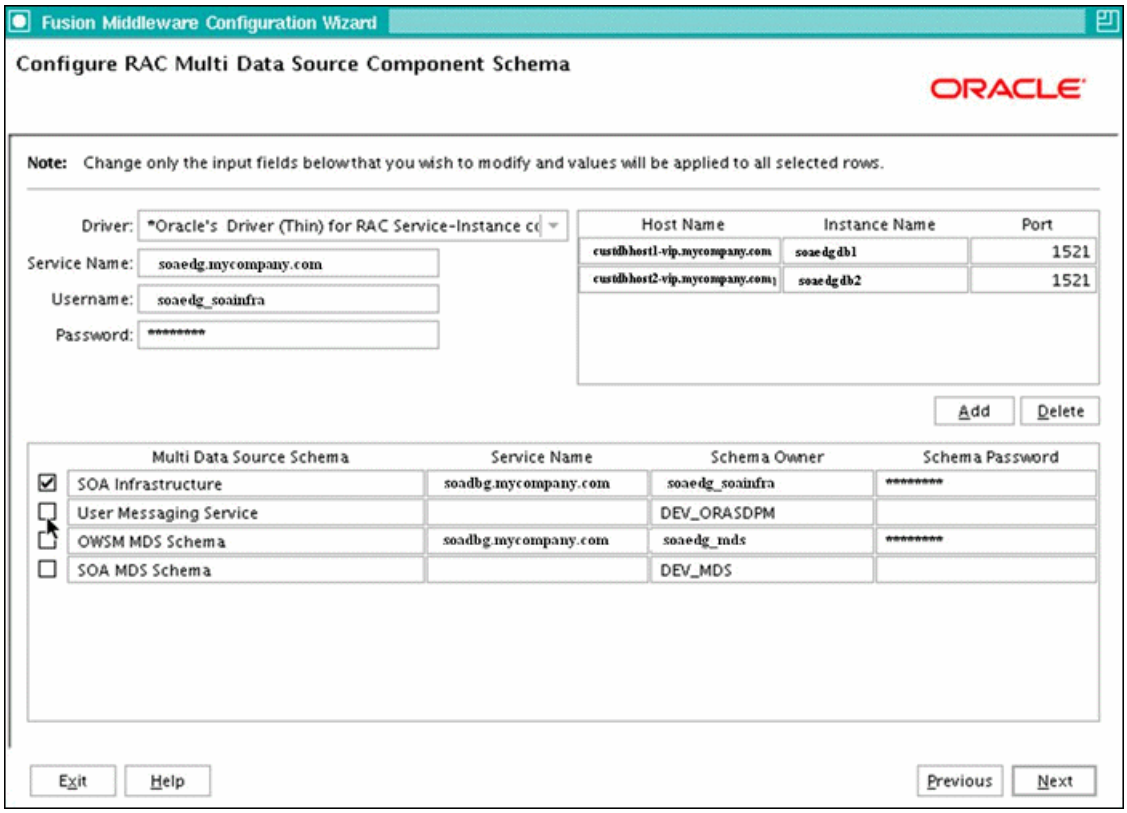
i. Select **SOA MDS Schema**.

j. Repeat steps b, c, and d for the SOA MDS Schema.

k. Leave the OWSM MDS Schema information as it is.

l. Click **Next**

Figure 5–2 Configure RAC Multi Data Source Component Schema Screen



9. In the Test JDBC Data Sources screen, the connections should be 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.

10. In the Select Optional Configuration screen, select the following:

    - JMS Distributed Destinations
    - Managed Servers, Clusters, and Machines
    - Deployments and Services

    Click **Next**.

11. In the Select JMS Distributed Destination Type screen:

- Select **UDD** from the drop down list for UMSJMSystemResource.
- Select **UDD** from the drop down list for SOAJMSModule.

12. In the Configure Managed Servers screen, add the required managed servers.

    A server called `soa_server1` is created automatically. Rename this to WLS_SOA1 and give it the attributes listed in Table 5–1. Then, add a new server called WLS_SOA2. The WLS_WSM1 and WLS_WSM2 managed servers should already be present because they are part of the domain that you are extending. In the end, the list of managed servers should match that in Table 5–1.

Table 5–1 Managed Servers

Name	Listen Address	Listen Port	SSL Listen Port	SSL Enabled
WLS_SOA1	SOAHOST1VHN1	8001	n/a	No
WLS_SOA2	SOAHOST2VHN1	8001	n/a	No
WLS_WSM1	SOAHOST1	7010	n/a	No
WLS_WSM2	SOAHOST2	7010	n/a	No

Click **Next**.

13. In the Configure Clusters screen, add the following clusters:

Table 5–2 Clusters

Name	Cluster Messaging Mode	Multicast Address	Multicast Port	Cluster Address
SOA_Cluster	unicast	n/a	n/a	Leave it empty.
WSM-PM_Cluster	unicast	n/a	n/a	Leave it empty.

Click **Next**.

14. In the Assign Servers to Clusters screen, assign servers to clusters as follows:
    - **SOA_Cluster:**
      - WLS_SOA1
      - WLS_SOA2
    - **WSM-PM_Cluster:**
      - WLS_WSM1
      - WLS_WSM2

    Click **Next**.

15. In the Configure Machines screen, do the following:
    - Delete the **LocalMachine** that appears by default.
    - Click the **Unix Machine** tab. The following entries appear (listed in Table 5–3):

Table 5–3 Machines

Name	Node Manager Listen Address
SOAHOST1	SOAHOST1
SOAHOST2	SOAHOST2

Leave all other fields to their default values.

Click **Next**.

16. In the Assign Servers to Machines screen, assign servers to machines as follows:
    - **ADMINHOST:**
      - AdminServer
    - **SOAHOST1:**
      - WLS_SOA1
      - WLS_WSM1
    - **SOAHOST2:**
      - WLS_SOA2
      - WLS_WSM2

    Click **Next**.

17. In the Target Deployments to Clusters or Servers screen, ensure the following targets:
    - **usermessagingserver** and **usermessagingdriver-email** should be targeted only to **SOA_Cluster**. (The usermessaging-xmpp, usermessaging-smpp, and usermessaging-voicexml applications are optional.)
    - The **oracle.sdp.***, and **oracle.soa.*** libraries should be targeted only to **SOA_Cluster**.
    - The **oracle.rules.*** library should be targeted only to **Admin Server** and **SOA_Cluster**.
    - The **wsm-pm** application should be targeted only to **WSM-PM_Cluster**.
    - The **oracle.wsm.seedpolicies** library should be targeted only to **WSM-PM_Cluster**.

      Target this library to the **SOA_Cluster** also only if you are planning to deploy WebLogic WebServices to it.

    Click **Next**.

18. In the Target Services to Clusters or Servers screen, ensure the following targets:
    - Target **JOC Startup Class** and **JOC Shutdown Class** only to **WSM-PM_Cluster**.
    - Target **mds-owsm**, **mds-owsm-rac0**, and **mds-owsm-rac1** to both **WSM-PM_Cluster** and **AdminServer**.

    Click **Next**.

19. In the Configuration Summary screen click **Extend**.

    Note: Click **OK** to dismiss the warning dialog about the domain configuration ports conflicting with the host ports. This warning appears because of the existing WSM-PM installation.

20. In the Extending Domain screen, click **Done**.

    You must restart the Administration Server for this configuration to take effect.

5.4 Restarting the Administration Server

Restart the Administration Server using the procedure in Section 4.5, "Creating boot.properties for the Administration Server on SOAHOST1."

5.5 Configuring Oracle Coherence for Deploying Composites

Although deploying composites uses multicast communication by default, Oracle recommends using unicast communication instead in SOA enterprise deployments. Use unicast if you disable multicast communication for security reasons.

> **Note:** An incorrect configuration of the Oracle Coherence framework that is used for deployment may prevent the SOA system from starting. The deployment framework must be properly customized for the network environment on which the SOA system runs. Oracle recommends the following configuration described in this section.

Enabling Communication for Deployment Using Unicast Communication

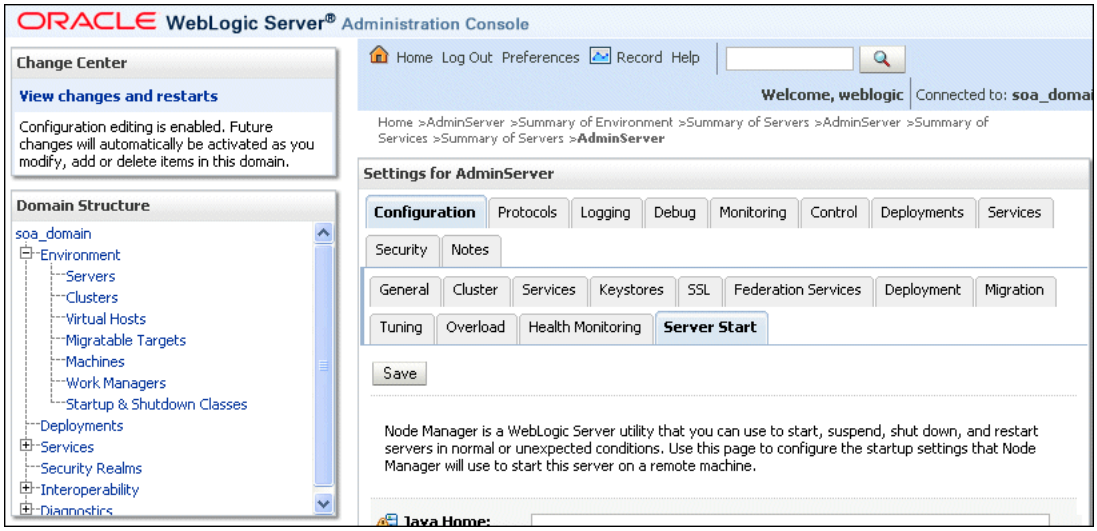
Multicast communication enables Oracle Fusion Middleware SOA to discover all of the members of a cluster to which to it deploys composites dynamically. However, unicast communication does not enable nodes to discover other cluster members in this way. Consequently, you must specify the nodes that belong to the cluster. You do not need to specify all of the nodes of a cluster, however. You need only specify enough nodes so that a new node added to the cluster can discover one of the existing nodes. As a result, when a new node has joined the cluster, it is able to discover all of the other nodes in the cluster. Additionally, in configurations such as SOA enterprise deployments where multiple IPs are available in the same box, you must configure Oracle Coherence to use a specific host name to create the Oracle Coherence cluster.

> **Tip:** To guarantee high availability during deployments of SOA composites, specify enough nodes so that at least one of them is running at any given time.

Specify the nodes using the `tangosol.coherence.wka<n>` system property, where `<n>` is a number between 1 and 9. You can specify up to 9 nodes. Start the numbering at 1. This numbering must be sequential and must not contain gaps. In addition, specify the host name used by Oracle Coherence to create a cluster through the `tangosol.coherence.localhost` system property. This local host name should be the virtual host name used by the SOA server as the listener addresses (SOAHOST2VHN1and SOAHOST2VHN1). Set this property by adding the `-Dtangosol.coherence.localhost` parameters to the Arguments field of the Oracle WebLogic Server Administration Console's Server Start tab (Figure 5–3).

> **Note:** SOAHOST1VHN1 is the virtual host name that maps to the virtual IP where WLS_SOA1 listening (in SOAHOST1). SOAHOST2VHN1 is the virtual host name that maps to the virtual IP where WLS_SOA2 is listening (in SOAHOST2).

Figure 5–3 Setting the Host Name Using the Start Server Tab of Oracle WebLogic Server Administration Console



Specifying the host name

To add the host name used by Oracle Coherence, complete these steps:

1. Log into the Oracle WebLogic Server Administration Console.
2. In the Domain Structure window, expand the **Environment** node.
3. Click **Servers**. The Summary of Servers page appears.
4. Click the name of the server (**WLS_SOA1** or **WLS_SOA2**, which are represented as hyperlinks) in Name column of the table. The settings page for the selected server appears.
5. Click **Lock and Edit**.
6. Click the **Server Start** tab (illustrated in Figure 5–3).
7. Enter the following for WLS_SOA1 and WLS_SOA2 into the Arguments field.

   For WLS_SOA1, enter the following:

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN1
   -Dtangosol.coherence.wka2=SOAHOST2VHN1
   -Dtangosol.coherence.localhost=SOAHOST1VHN1
   ```

   For WLS_SOA2, enter the following:

   ```
   -Dtangosol.coherence.wka1=SOAHOST2VHN1
   -Dtangosol.coherence.wka2=SOAHOST1VHN1
   -Dtangosol.coherence.localhost=SOAHOST2VHN1
   ```

Note: The Coherence cluster used for deployment uses port 8088 by default. This port can be changed by specifying a different port (for example, 8089) with the -Dtangosol.coherence.wkan.port and -Dtangosol.coherence.localport startup parameters. For example:

WLS_SOA1 (enter the following into the Arguments field on a single line, without a carriage return):

```
-Dtangosol.coherence.wka1=SOAHOST1VHN1
-Dtangosol.coherence.wka2=SOAHOST2VHN1
-Dtangosol.coherence.localhost=SOAHOST1VHN1
-Dtangosol.coherence.localport=8089
-Dtangosol.coherence.wka1.port=8089
-Dtangosol.coherence.wka2.port=8089
```

WLS_SOA2 (enter the following into the Arguments field on a single line, without a carriage return):

```
-Dtangosol.coherence.wka1=SOAHOST1VHN1
-Dtangosol.coherence.wka2=SOAHOST2VHN1
-Dtangosol.coherence.localhost=SOAHOST2VHN1
-Dtangosol.coherence.localport=8089
-Dtangosol.coherence.wka1.port=8089
-Dtangosol.coherence.wka2.port=8089
```

Note: There should be no breaks in lines between the different -D parameters. Do not copy or paste the text from above to your Administration Console's arguments text field. This may result in HTML tags being inserted in the Java arguments. The text should not contain other text characters than those included the example above.

8. Click **Save** and **Activate Changes**.

Note: You must ensure that these variables are passed to the managed server correctly. (They should be reflected in the server's output log.) Failure of the Oracle Coherence framework can prevent the soa-infra application from starting.

Note: The multicast and unicast addresses are different from the ones used by the WebLogic Server cluster for cluster communication. SOA guarantees that composites are deployed to members of a single WebLogic Server cluster even though the communication protocol for the two entities (the WebLogic Server cluster and the groups to which composites are deployed) are different.

5.6 Setting Connection Destination Identifiers for B2B Queues

Oracle B2B uses specific JMS Destination Member calls, and requires setting the Create Destination Identifier (CDI) for these calls to succeed. To set up the CDI:

1. Log into the Oracle WebLogic Server Administration Console.

2. In the Domain Structure window, expand the **Services** node, and then the **Messaging** node.
3. Click **JMS Modules**, and then **SOAJMSModule**.
4. Click **Lock and Edit**.
5. Click the **dist_B2BEventQueue_auto**, **Configuration**, and the **General** tab, and then click **Advanced**.
6. In the **Create Destination Identifier** field, add the following jndi name for the queue:

   `jms/b2b/B2BEventQueue`
7. Repeat these steps, creating the following Create Destination Identifiers for the queues listed below:
   - **dist_B2B_OUT_QUEUE_auto** : `jms/b2b/B2B_OUT_QUEUE`
   - **dist_B2B_IN_QUEUE_auto** : `jms/b2b/B2B_IN_QUEUE`
   - **dist_B2BBroadcastTopic_auto** : `jms/b2b/B2BBroadcastTopic`
   - **dist_XmlSchemaChangeNotificationTopic_auto** : `jms/fabric/XmlSchemaChangeNotificationTopic`
8. Click **Save and Active Changes**.

5.7 Disabling Host Name Verification for the WLS_SOA*n* Managed Server

This step is required if you have not set up the appropriate certificates to authenticate the different nodes with the Administration Server (see Chapter 7, "Setting Up Node Manager"). If you have not configured the server certificates, you will receive errors when managing the different WebLogic Servers. To avoid these errors, disable host name verification while setting up and validating the topology, and enable it again once the Enterprise Deployment topology configuration is complete as described in Chapter 7, "Setting Up Node Manager."

To disable host name verification, complete these steps:

1. Log in to Oracle WebLogic Server Administration Console.
2. Click **Lock and Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page appears.
5. Select **WLS_SOA1** (represented as a hyperlink) from the Names column of the table. The Settings page appears.
6. Select the **SSL** tab.
7. Expand the **Advanced** section of the page.
8. Set Hostname Verification to **None**.
9. Click **Save**.
10. Repeat these steps for the WLS_SOA2 managed server.
11. Save and activate the changes.

5.8 Restarting the Node Manager on SOAHOST1

To restart the Node Manager on SOAHOST1:

1. Stop Node Manager by stopping the process associated with it:
   a. If it is running in the foreground in a shell, simply use CTRL+C.
   b. If it is running in the background in the shell, find the associate process and use the `kill` command to stop it. For example:

```
SOAHOST1> ps -ef | grep NodeManager
orcl      9139  9120  0 Mar03 pts/6    00:00:00 /bin/sh
./startNodeManager.sh

SOAHOST1>kill -9 9139
```

2. Start Node Manager:

```
SOAHOST1> ./startNodeManager.sh
```

5.9 Propagating the Domain Changes to the Managed Server Domain Directory

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 `pack` command on SOAHOST1 to create a template pack using the following commands:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin

SOAHOST1> ./pack.sh -managed=true -domain=ORACLE_BASE/admin/<domain_
name>/aserver/<domain_name>
-template=soadomaintemplateExtSOA.jar -template_name=soa_domain_templateExtSOA
```

3. Run the `unpack` command on SOAHOST1 to `unpack` the propagated template to the domain directory of the managed server using the following command:

```
SOAHOST1> ./unpack.sh -domain=ORACLE_BASE/admin/<domain_name>/mserver/<domain_
name>
-overwrite_domain=true -template=soadomaintemplateExtSOA.jar
-app_dir=ORACLE_BASE/admin/<domain_name>/mserver/applications
```

> **Note:** The `-overwrite_domain` option in the unpack command, allows 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 had been applied to the start scripts and ear files in the managed server domain directory, they must be restored after this unpack operation.

5.10 Starting the WLS_SOA1 Managed Server on SOAHOST1

To start the WLS_SOA1 managed server on SOAHOST1, complete these steps:

1. Access the Administration Console at `http://ADMINVHN:7001/console`.

2. Click **Servers**.
3. Open the **Control** tab.
4. Select **WLS_SOA1**.
5. Click **Start**.

> **Note:** ADMINVHN is the virtual host name that maps to the virtual IP where the Administration Server is listening (in SOAHOST1).

5.11 Validating the WLS_SOA1 Managed Server

To validate the WLS_SOA1 managed server, complete these steps:

1. Verify that the server status is reported as **Running** in the Admin 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. See Section 11.6, "Troubleshooting"for possible causes.
2. Access `http://SOAHOST1VHN1:8001/soa-infra/` to verify status of WLS_SOA1.
3. Access `http://SOAHOST1VHN1:8001/b2bconsole/` to verify status of B2B.
4. Access `http://SOAHOST1VHN1:8001/integration/worklistapp/` to verify status of the worklist application. Before verifying access is granted, ensure that the WLS_WSM1 managed server is up and running.

> **Note:** Notice that, although the WLS_SOA1 server may be up, some applications may be in a failed state. Therefore, Oracle recommends verifying the URLs above and watch for errors pertaining each individual application in the server's output file.

5.12 Propagating the Domain Configuration to SOAHOST2 Using the unpack Utility

To propagate the domain configuration, complete these steps:

1. Run the following command on SOAHOST1 to copy the template file created in the previous step to SOAHOST2.

```
SOAHOST1> cd ORACLE_HOME/common/bin

SOAHOST1> scp soadomaintemplateExtSOA.jar oracle@node2:ORACLE_HOME/common/bin
```

2. Run the `unpack` command on SOAHOST2 to unpack the propagated template.

```
SOAHOST2> cd ORACLE_HOME/common/bin

./unpack.sh
-domain=ORACLE_BASE/admin/domain_name/mserver/domain_name/
-template=soadomaintemplateExtSOA.jar -overwrite_domain=true
-app_dir=ORACLE_BASE/admin/domain_name/mserver/applications
```

Note: The `-overwrite_domain` option in the unpack command, allows 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 had been applied to the start scripts and ear files in the managed server domain directory, they must be restored after this unpack operation.

5.13 Restarting Node Manager on SOAHOST2

Perform the steps in Section 5.8, "Restarting the Node Manager on SOAHOST1" on SOAHOST2.

5.14 Starting and Validating the WLS_SOA2 Managed Server

Perform these steps to start the WLS_SOA2 managed server and check that it is configured correctly:

1. Start the WLS_SOA2 managed server using the Administration Console.
2. Verify that the server status is reported as "Running" in the Admin 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. See Section 11.6, "Troubleshooting" for possible causes.
3. Access `http://SOAHOST2VHN1:8001/soa-infra`.
4. Access `http://SOAHOST2VHN1:8001/b2bconsole` to verify status of B2B.
5. Access `http://SOAHOST2VHN1:8001/integration/worklistapp/` to verify status of the worklist application. Before verifying access is granted, ensure that at least one of the managed servers (WLS_WSM1 or WLS_WSM2) is up and running.

Note: Although the WLS_SOA1 server may be up, some applications may be in a failed state. Therefore, Oracle recommends verifying the URLs above and watch for errors pertaining each individual application in the server's output file.

5.15 Configuring Oracle HTTP Server for the WLS_SOA*n* Managed Servers

To enable Oracle HTTP Server to route to the SOA_Cluster, which contains the WLS_SOA*n* managed servers, you must set the `WebLogicCluster` parameter to the list of nodes in the cluster.

1. On WEBHOST1 and WEBHOST2, add the following lines to the *ORACLE_BASE/admin/<instance_name>/config/OHS/<component_name>/mod_wl_ohs.conf* file:

```
# SOA soa-infra app
<Location /soa-infra>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>
```

```
# SOA inspection.wsil
<Location /inspection.wsil>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# Worklist
<Location /integration>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# B2B
<Location /b2bconsole>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# UMS prefs
<Location /sdpmessaging/userprefs-ui>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# Default to-do taskflow
<Location /DefaultToDoTaskFlow>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# Workflow
<Location /workflow>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# UMS parlay
<Location /sdpmessaging/parlayx>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# UMS WS
<Location /ucs/messaging/webservice>
    SetHandler weblogic-handler
```

```
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

#Required if attachments are added for workflow tasks
 <Location /ADFAttachmentHelper>
    SetHandler weblogic-handler
    WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

# SOA composer application
 <Location /soa/composer>
     SetHandler weblogic-handler
     WebLogicCluster SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>
```

Note: The entry for `/workflow` is optional. It is for workflow tasks associated with ADF task forms. The `/workflow` URL itself can be a different value, depending on the form.

2. Restart Oracle HTTP Server on WEBHOST1 and WEBHOST2:

```
WEBHOST1> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
ias-component=ohs1
WEBHOST2> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
ias-component=ohs2
```

The servers specified in the `WebLogicCluster` parameter are only important at startup time for the plug-in. The list needs to provide at least one running cluster member for the plug-in to discover other members of the cluster. Note that the listed cluster member must be running when Oracle HTTP Server is started. Oracle WebLogic Server and the plug-in work together to update the server list automatically with new, failed, and recovered cluster members.

Sample scenarios:

- Example 1: If you have a two-node cluster and then add a third member, you do not need to update the configuration to add the third member. The third member will be discovered on the fly at runtime.
- Example 2: You have a three-node cluster but only two nodes are listed in the configuration. However, if both listed nodes are down when you start Oracle HTTP Server, then the plug-in would fail to route to the cluster. You must ensure that at least one of the listed nodes is running when you start Oracle HTTP Server.

  If you list all members of the cluster, then you guarantee you can route to the cluster, assuming at least one member is running when Oracle HTTP Server is started.

For more information on configuring the WebLogic Server plug-in, see the *Oracle Fusion Middleware Using Web Server Plug-Ins with Oracle WebLogic Server* guide.

5.16 Validating Access Through Oracle HTTP Server

Verify that the server status is reported as "Running" in the Admin 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. See Section 11.6, "Troubleshooting" for possible causes.

Verify that you can access these URLs, where `'webhostN'` specifies the name of each Oracle HTTP Server host (for example, `WEBHOST1`, `WEBHOST2`):

- `http://webhostN:7777/soa-infra`
- `http://webhostN:7777/integration/worklistapp`
- `http://webhostN:7777/b2bconsole`
- `http://webhostN:7777/sdpmessaging/userprefs-ui`
- `http://webhostN:7777/soa/composer`

Validate SOA_Cluster through both Oracle HTTP Server instances.

Refer to load balancer configuration to access the system through the load balancer.

5.17 Setting the Frontend HTTP Host and Port

You must set the frontend HTTP host and port for the Oracle WebLogic Server cluster:

1. In the WebLogic Server Administration Console, in the Change Center section, click **Lock & Edit**.
2. In the left pane, choose **Environment** in the Domain Structure window and then choose **Clusters**. The Summary of Clusters page appears.
3. Select the **SOA_Cluster** cluster.
4. Select **HTTP**.
5. Set the values for the following:
   - **Frontend Host**: wc.mycompany.com
   - **Frontend HTTPS Port**: 443
   - **Frontend HTTP Port**: 80
6. Click **Save**.
7. To activate the changes, click **Activate Changes** in the Change Center section of the Administration Console.
8. Restart the servers to make the Frontend Host directive in the cluster effective.

Note: When HTTPS is enabled in the load balancer and the load balancer terminates SSL (the SOA servers receive only HTTP requests, not HTTPS), as suggested in this guide, the endpoint protocol for webservices is set to `http`. Since the load balancer redirects HTTP to HTTPS this causes the following exception when testing webservices fucntionality in Oracle Enterprise Manger Fusion Middleware Control:

```
(javax.xml.soap.SOAPException:
oracle.j2ee.ws.saaj.ContentTypeException)
```

To resolve this exception, update the URL endpoint:

In the Enterprise Manager Test Page, check **Edit Endpoint URL**.

Within the endpoint URL page:

- Change `http` to `https`.
- Change the default port number (say 80) to SSL port (say 443).

Note: If you do not set the frontend HTTP host and port, you get the following message when trying to retrieve a document definition XSD from Oracle B2B:

```
An error occured while loading the document definitions.
java.lang.IllegalArgumentException: Cluster address must be set
when clustering is enabled.
```

Callback URL

The SOA system calculates the callback URL as follows:

- If a request to SOA originates from an external or internal service, then SOA uses the callback URL specified by the client.
- If a request to an external or internal asynchronous service originates from SOA, the callback URL is determined using the following method, in decreasing order of preference:
  1. Use `callbackServerURL` specified as a binding property for the specific reference. (You can set this when modeling the composite or at runtime using the MBeans). This allows different service calls to have different callback URLs. That is, a callback URL from an external service can be set to be different than one to an internal service In the context of the Enterprise Deployment architecture, typically this will be `wc.mycompany.com` (443/https) for external services and `wcinternal.mycompany.com` (7777/http) for internal services. At runtime, this property is set using the System MBean Browser, through the corresponding binding mbean. To add a specific URL, add a `callbackServerURL` property to its Properties attribute, then invoke the save operation.
  2. Use the callback URL as specified in *soa-infra-config.xml*. In this case, only one address can be specified. When a mix of both external and internal services can be invoked, this should be set to `wc.mycompany.com` (443/https) in the Enterprise Deployment architecture. When only internal services are to be invoked, this can be set to `wcinternal.mycompany.com` (7777/http).

3. Use the callback URL as the frontend host specified in WLS for the SOA_Cluster. In this case, too, only one address can be specified and the recommendation is same as the one for *soa-infra-config.xml*.
4. Use the local host name as provided by WLS MBean APIs. This is not recommended in HA environments such as Enterprise Deployment.

5.18 Setting the WLS Cluster address for Direct Binding/RMI invocations to composites

When using direct binding composites, you must set the WLS Cluster address for the SOA_Cluster. To set the WLS Cluster address:

1. In the WebLogic Server Administration Console, in the **Change Center** section, click **Lock & Edit**.
2. In the left pane, choose **Environment** from the **Domain Structure** window, and then choose **Clusters**. The Summary of Clusters page appears.
3. Select the **SOA_Cluster** cluster.
4. In the **Configuration**, **General** tab, enter the following in the **Cluster Address** field:

   ```
   SOAHOST1VHN1:8001,SOAHOST2VHN1:8001
   ```

5. Click **Save**.
6. To activate the changes, click **Activate Changes** in the **Change Center** section of the Administration Console.
7. Restart the servers for the Frontend Host directive to take effect in the cluster.

Note: For asynch request/response interactions over direct binding, the SOA composites must provide their jndi provider URL for the invoked service to look up the beans for callback.

If soa-infra config properties are not specified, but the WLS Cluster address is specified, the cluster address from the JNDI provider URL is used. This cluster address can be a single DNS name which maps to the clustered servers' IP addresses or a comma separated list of server ip:port. Alternatively, the soa-infra config property `JndiProviderURL/SecureJndiProviderURL` can be used for the same purpose if explicitly set by users.

5.19 Configuring a Shared JMS Persistence Store

Configure the location for all of the persistence stores as a directory that is visible from both nodes. For more information see Section 2.3, "Shared Storage and Recommended Directory Structure." You must then change all of the persistent stores to use this shared base directory as follows:

1. Log into the Oracle WebLogic Server Administration Console.
2. In the Domain Structure window, expand the **Services** node and then click the **Persistence Stores** node. The Summary of Persistence Stores page appears.
3. Select the persistence store (represented as a hyperlink) from the Name column of the table. The Settings page for the persistence store appear.

4. In the Configuration tab, enter the location on a persistent storage solution (such as NAS or SAN) that is available to other servers in the cluster in the Directory field. Specifying this location enables pending JMS messages to be sent. The location should follow the following directory structure:

   ```
   ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/jms
   ```

   Note: Both WLS_SOA1 and WLS_SOA2 must be able to access this directory. This directory must also exist before you restart the server.

5. Click **Save** and activate changes.
6. Restart the servers to make the change in the persistent stores effective.

5.20 Configuring a Default Persistence Store for Transaction Recovery

Each server has a transaction log that stores information about committed transactions that are coordinated by the server that may not have been completed. The 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 servers within a cluster, store the transaction log in a location accessible to a server and its backup servers.

Note: Preferably, this location should be a dual-ported SCSI disk or on a Storage Area Network (SAN).

To set the location for the default persistence store, complete these steps:

1. Log into the Oracle WebLogic Server Administration Console.
2. In the Domain Structure window, expand the **Environment** node and then click the **Servers** node. The Summary of Servers page appears.
3. 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.
4. Click the **Services** tab.
5. In the Default Store section of the page, enter the path to the folder where the default persistent stores will store its data files. The directory structure of the path is as follows:

   ```
   ORACLE_BASE/admin/<domain_name>/<soa_cluster_name>/tlogs
   ```

6. Click **Save**.

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. Both WLS_SOA1 and WLS_SOA2 must be able to access this directory. This directory must also exist before you restart the server.

5.21 Enabling High Availability for Oracle File and FTP Adapters

The Oracle File and FTP Adapters enable a BPEL process or an Oracle Mediator to read and write files on local file systems and on remote file systems through FTP (File Transfer Protocol). These adapters support high availability for an active-active topology with Oracle BPEL Process Manager and Oracle Mediator service engines for both inbound and outbound operations. To make Oracle File and FTP Adapters highly available for outbound operations, use the database mutex locking operation as described in "High Availability in Outbound Operations" in *Oracle Fusion Middleware User's Guide for Technology Adapters*. The database mutex locking operation enables these adapters to ensure that multiple references do not overwrite one another if they write to the same directory.

Note: The operation described above is necessary only if your application requires these adapters.

Note: The File Adapter picks up a file from the inbound directory, processes it, and then outputs a file to the output directory. Because the File Adapter is non-transactional, files can be processed twice. As a result, it is possible to get duplicate files when there is failover in the RAC backend or in the SOA managed servers.

5.21.1 Using the Database Mutex Locking Operation

Use the following procedure to make an outbound Oracle File or FTP Adapter service highly available using database table as a coordinator:

Note: You must increase global transaction timeouts if you use database as a coordinator.

1. **Create Database Tables**

   You are not required to perform this step since the database schemas are pre-created as a part of soainfra.

2. **Modify Deployment Descriptor for Oracle File Adapter**

   Modify Oracle File Adapter deployment descriptor for the connection-instance corresponding to `eis/HAFileAdapter` from the Oracle WebLogic Server console:

   a. Log into your Oracle WebLogic Server console. To access the console navigate to `http://`*`servername`*`:`*`portnumber`*`/console`.

   b. Click **Deployments** in the left pane for Domain Structure.

   c. Click **FileAdapter** under Summary of Deployments on the right pane.

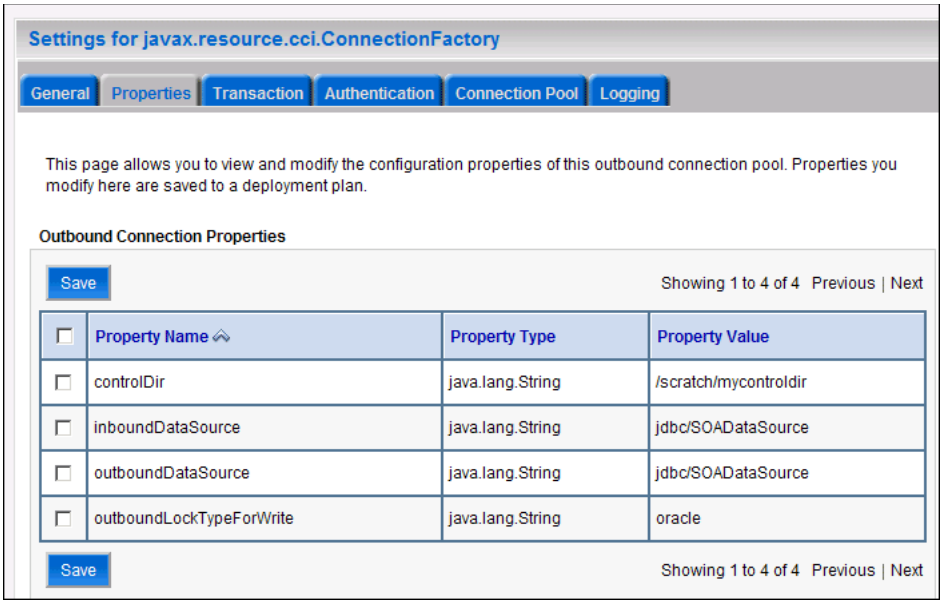
   d. Click the **Configuration** tab.

   e. Click the **Outbound Connection Pools** tab, and expand **javax.resource.cci.ConnectionFactory** to see the configured connection factories.

   f. Click **eis/HAFileAdapter**. The Outbound Connection Properties for the connection factory corresponding to high availability is displayed.

g. The connection factory properties appear as shown in Figure 5–4.

Figure 5–4 Oracle WebLogic Server Console - Settings for javax.resource.cci.Connectionfactory Page



Click on **Lock and Edit**. After this, the property value column becomes editable (you can click on any of the rows under "Property Value" and modify its value).

The new parameters in connection factory for Oracle File and FTP Adapters are as follows:

`controlDir`: Set it to the directory structure where you want the control files to be stored. You must set it to a shared location if multiple WebLogic Server instances run in a cluster. Structure the directory for shared storage as follows:

```
ORACLE_BASE/admin/<domain_name>/<cluster_name>/fadapter
```

`inboundDataSource`: Set the value to `jdbc/SOADataSource`. This is the data source, where the schemas corresponding to high availability are pre-created. The pre-created schemas can be found under `ORACLE_HOME/rcu/integration/soainfra/sql/adapter/createschema_adapter_oracle.sql`. If you want to create the schemas elsewhere, use this script. You must set the inboundDataSource property accordingly if you choose a different schema.

`outboundDataSource`: Set the value to `jdbc/SOADataSource`. This is the data source where the schemas corresponding to high availability are pre-created. The pre-created schemas can be found under `ORACLE_HOME/rcu/integration/soainfra/sql/adapter/createschema_adapter_oracle.sql`. If you want to create the schemas elsewhere, use this script. You must set the outboundDataSource property if you choose to do so.

`outboundDataSourceLocal`: Set the value to `jdbc/SOALocalTxDataSource`. This is the datasource where the schemas corresponding to high availability are pre-created.

`outboundLockTypeForWrite`: Set the value to `oracle` if you are using Oracle Database. By default the Oracle File and FTP Adapters use an

in-memory mutex to lock outbound write operations. You must choose from the following values for synchronizing write operations:

`memory`: The Oracle File and FTP Adapters use an in-memory mutex to synchronize access to the file system.

oracle: The adapter uses Oracle Database sequence.

`db`: The adapter uses a pre-created database table (`FILEADAPTER_MUTEX`) as the locking mechanism. You must use this option only if you are using a schema other than the Oracle Database schema.

`user-defined`: The adapter uses a user-defined mutex. To configure the user-defined mutex, you must implement the mutex interface: `"oracle.tip.adapter.file.Mutex"` and then configure a new binding-property with the name `"oracle.tip.adapter.file.mutex"` and value as the fully qualified class name for the mutex for the outbound reference.

h. Click **Save** after you update the properties. The Save Deployment Plan page appears.

i. Enter a shared storage location for the deployment plan. The directory structure is as follows:

```
ORACLE_BASE/admin/<domain_name>/<cluster_name>/dp/Plan.xml
```

j. Click **Save and Activate**.

k. Configure BPEL Process or Mediator Scenario to use the connection factory as shown in the following example (in the jca file included in the composite for the binding component):

```
<adapter-config name="FlatStructureOut" adapter="File Adapter"
xmlns="http://platform.integration.oracle/blocks/adapter/fw/metadata">
  <connection-factory location="eis/HAFileAdapter" adapterRef=""/>
  <endpoint-interaction portType="Write_ptt" operation="Write">
<interaction-spec
className="oracle.tip.adapter.file.outbound.FileInteractionSpec">
      <property../>
      <property../>
    </interaction-spec>
  </endpoint-interaction>
</adapter-config>
```

Note: The location attribute is set to `eis/HAFileAdapter` for the connection factory.

5.22 Scaling the Oracle Database Adapter

If you are using Logical Delete polling, and you set `MarkReservedValue`, skip locking is not used.

Formerly, the best practice for multiple Oracle Database Adapter process instances deployed to multiple Oracle BPEL Process Manager, or Oracle Mediator nodes was essentially using `LogicalDeletePollingStrategy` or `DeletePollingStrategy` with a unique `MarkReservedValue` on each polling node, and setting `MaxTransactionSize`.

However, with the introduction of skip locking in this release that approach has now been superseded. If you were using this approach previously, you can simply remove

(in db.jca) or clear (Logical Delete Page of wizard) the MarkReservedValue, and you automatically get skip locking.

The benefits of using skip locking over a reserved value include:

- Skip locking scales better in a cluster and under load.
- All work is in one transaction (as opposed to update/reserve, then commit, then select in a new transaction), so the risk of facing a non-recoverable situation in a high availability environment is minimized.
- No unique `MarkReservedValue` must be specified. Previously, for this to work you would have to configure a complex variable, such as `R${weblogic.Name-2}-${IP-2}-${instance}`.

For more information, see "Scalability" and "Polling Strategies" in *Oracle Fusion Middleware User's Guide for Technology Adapters*.

5.23 Backing Up the Installation

After you have verified that the extended domain is working, back up the installation. This is a quick backup for the express purpose of immediate restore in case of problems in the further steps. The backup destination is the local disk. This backup can be discarded once the enterprise deployment setup is complete. At this point, the regular deployment-specific backup and recovery process can be initiated. The *Oracle Fusion Middleware Administrator's Guide* provides further details. For information on describing the Oracle HTTP Server data that must be backed up and restored, refer to the "Backup and Recovery Recommendations for Oracle HTTP Server" section in this guide. For information on how to recover components, see "Recovery of Components" and "Recovery After Loss of Component" sections in the guide. For recommendations specific to recovering from the loss of a host, see the "Recovering Oracle HTTP Server to a Different Host" in the guide. Also refer to the *Oracle Database Backup and Recovery Guide* for information on database backup.

To back up the installation a this point, complete these steps:

1. Back up the web tier:
   a. Shut down the instance using `opmnctl`.

      ```
      ORACLE_BASE/admin/<instance_name>/bin/opmnctl stopall
      ```

   b. Back up the Middleware Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web.tar $MW_HOME
      ```

   c. Back up the Instance Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web_instance.tar $ORACLE_INSTANCE
      ```

   d. Start the instance using `opmnctl`:

      ```
      ORACLE_BASE/admin/<instance_name>/bin/opmnctl startall
      ```

2. Back up the database. This is a full database backup (either hot or cold) using Oracle Recovery Manager (recommended) or OS tools such as `tar` for cold backups if possible.

3. Back up the Administration Server domain directory to save your domain configuration. The configuration files all exist under the ORACLE_BASE/admin/<domain_name> directory.

```
SOAHOST1> tar -cvpf edgdomainback.tar ORACLE_BASE/admin/<domain_name>
```

Note: ORACLE_HOME should be backed up if any changes are made to the XEngine configuration that are part of your B2B setup. These files are located under ORACLE_HOME/soa/thirdparty/edifecs/XEngine. To back up ORACLE_HOME, execute the following command:

```
SOAHOST1> tar -cvpf fmwhomeback.tar MW_HOME
```

6

Extending the Domain for WebCenter Components

This chapter describes how to use the Configuration wizard to extend the domain that you created in Chapter 4, "Creating a Domain." It contains the following sections:

- Section 6.21, "Validating Access Through the Load Balancer"
- Section 6.22, "Backing Up the Installation"

6.1 Installing Oracle Fusion Middleware Home

You must install Oracle Fusion Middleware on WCHOST1 and WCHOST2. These nodes will run managed servers configured with WebCenter components.

Follow the steps in Section 4.1, "Installing Oracle Fusion Middleware Home". You must install both Oracle WebLogic Server and WebCenter.

6.2 Extending the Domain for WebCenter Components

In this step, you extend the domain created in Chapter 4, "Creating a Domain" to contain WebCenter components.

Note: You must back up the current domain before extending the domain. You may use the backup to recover in case any errors were made in the domain extension. See *Oracle Fusion Middleware Administrator's Guide*.

---

1. Change directory to the location of the Configuration wizard. This is within the WebCenter home directory.

   ```
   SOAHOST1> cd MW_HOME/wc/common/bin
   ```

2. Start the Configuration Wizard.

   ```
   SOAHOST1> ./config.sh
   ```

   Note: If you run the Configuration Wizard from the same shell and environment that you used to create the domain, you must deselect the `CONFIG_JVM_ARGS=-DTemplateCatalog.enable.selectable.all=true` variable. Otherwise, the Configuration Wizard displays all of the available templates, which are not needed for extending the domain for WebCenter components.

   ---

3. In the Welcome screen, select **Extend an existing WebLogic domain**, and click **Next**.
4. In the WebLogic Domain Directory screen, Select the WebLogic domain directory (**ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>**), and click **Next**.
5. In the Select Extension Source screen, do the following:
   - Select **Extend my domain automatically to support the following added products**.
   - Select the following products:
     - **Oracle WebCenter Spaces**
     - **Oracle Portlet Producers**
     - **Oracle WebCenter Discussions Server**

- **Oracle WebCenter Activity Graph Engines**
- **Oracle WebCenter Personalization**
- **Oracle Webcenter Analytics Collector**
- **Oracle WebCenter Pagelet Producer**

The following products should already be selected, and grayed out. They were selected when you created in domain in Section 4.4, "Running the Configuration Wizard on SOAHOST1 to Create a Domain."

- Basic WebLogic Server Domain
- JRF
- WSM-PM

Click **Next**.

6. If you get a "Conflict Detected" message that Oracle JRF is already defined in the domain, select the **Keep Existing Component** option and click **OK**.
7. In the Configure JDBC Data Sources screen, do the following:
   a. Ensure that the following data sources appear on the screen. The user names shown in Table 6–1 assume that `wcedg` was used as prefix for schema creation from RCU.

Table 6–1 Values for Data Sources

Data Source	User Name
ActivitiesDS Schema	`wcedg_activities`
DiscussionDS Schema	`wcedg_discussions`
PersonalizationDS Schema	`wcedg_webcenter`
PortletDS Schema	`wcedg_portlet`
WebCenter DS Schema	`wcedg_webcenter`
WebCenter MDS Schema	`wcedg_mds`
Personalization MDS Schema	`wcedg_mds`
mds-PageletProducerDS Schema	`wcedg_mds`

   b. Select the check box next to all the component schemas.
   c. Select **Configure all datasources as RAC multi-datasources in the next panel**.
   d. Click **Next**.
8. Configure RAC Multi Data Sources screen
   a. Enter values for the following fields, specifying the connect information for the 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, for example, `wcedg.mycompany.com`.
      - **Username prefix:** Enter the user name for each of the schemas by selecting each schema individually. The user names shown in Table 6–1 assume that `wcedg` was used as prefix for schema creation from RCU.

- **Password and Confirm Password:** enter the password to use to access the schemas.

b. Click **Add** and enter the details for the first RAC instance.

c. Repeat for each RAC instance.

d. Click **Next**.

9. In the Test JDBC Data Sources screen, the connections should be 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.

10. In the Advanced Configuration Screen, select the following:

- Managed Servers, Clusters and Machines
- Deployments and Services

Click **Next**.

11. In the Configure Managed Servers screen, add the following managed servers:

Table 6–2 Managed Servers

Name	Server	Listen Port	SSL Listen Port	SSL Enabled
WC_Spaces1	WCHOST1	9000	n/a	No
WC_Spaces2	WCHOST2	9000	n/a	No
WC_Portlet1	WCHOST1	9001	n/a	No
WC_Portlet2	WCHOST2	9001	n/a	No
WC_Collaboration1	WCHOST1	9002	n/a	No
WC_Collaboration2	WCHOST2	9002	n/a	No
WC_Utilities1	WCHOST1	9003	n/a	No
WC_Utilities2	WCHOST2	9003	n/a	No

Note: Managed Servers may be renamed here but DO NOT remove any of the original Managed Servers on this page.

Note: Providing the listen address is mandatory if the cluster mode is 'unicast'.

Click **Next**.

12. The Configure Clusters screen should already include the WSM_PM Cluster in the list. Add the following three new clusters:

Table 6–3 Clusters

Name	Cluster Messaging Mode	Multicast Address	Multicast Port	Cluster Address
Spaces_Cluster	unicast	n/a	n/a	Leave it empty.

Table 6–3 (Cont.) Clusters

Name	Cluster Messaging Mode	Multicast Address	Multicast Port	Cluster Address
Portlet_Cluster	unicast	n/a	n/a	Leave it empty.
Collab_Cluster	unicast	n/a	n/a	Leave it empty.
Utilities_Custer	unicast	n/a	n/a	Leave it empty.

Click **Next**.

13. In the Assign Servers to Clusters screen, assign servers to clusters as follows:
    - **Spaces_Cluster**:
      - WC_Spaces1
      - WC_Spaces2
    - **Portlet_Cluster**:
      - WC_Portlet1
      - WC_Portlet2
    - **Collab_Cluster**:
      - WC_Collaboration1
      - WC_Collaboration2
    - **Utilities_Cluster**:
      - WC_Utilities1
      - WC_Utilities2

    Click **Next**.

14. In the Configure Machines screen, click the Unix Machine tab. Make sure the following four entries exist:

Table 6–4 Machines

Name	Node Manager Listen Address
SOAHOST1	SOAHOST1 Note that SOAHOST1 should already be configured when you ran the Configuration wizard in Section 4.4, "Running the Configuration Wizard on SOAHOST1 to Create a Domain."
SOAHOST2	SOAHOST2 Note that SOAHOST2 should already be configured when you ran the Configuration wizard in Section 4.4, "Running the Configuration Wizard on SOAHOST1 to Create a Domain."
WCHOST1	WCHOST1
WCHOST2	WCHOST2

Leave all other fields to their default values.

Click **Next**.

15. In the Assign Servers to Machines screen, assign servers to machines as follows:
    - **SOAHOST1:**

  - AdminServer
  - WLS_WSM1
- **SOAHOST2:**
  - WLS_WSM2
- **WCHOST1:**
  - WC_Spaces1
  - WC_Portlet1
  - WC_Collaboration1
  - WC_Utilities1
- **WCHOST2:**
  - WC_Spaces2
  - WC_Portlet2
  - WC_Collaboration2
  - WC_Utilities2

Note: You can rename the originals servers, which appear by default in the Configuration Wizard, but never delete them.

Click **Next**.

16. In the Target Deployment to Clusters or Servers screen, click **Next**.
17. In the Target Services to Clusters or Servers screen, click **Next**.
18. In the Configuration Summary screen, do not change the values that appear on the screen (since you are extending a domain). Click **Extend**.
19. In the Extending Domain screen, click **Done**.

6.3 Restarting the Administration Server

Restart the Administration Server so that the changes to the domain are picked up.

1. Stop the Administration Server.

```
SOAHOST1> ./stopWebLogic.sh
```

2. Start the Administration Server:

```
SOAHOST1> ./startWebLogic.sh
```

6.4 Disabling Host Name Verification for the WebCenter Managed Servers

Before you can start and verify the managed servers, you must disable host name verification. You can re-enable it after you set up SSL communication between the Administration Server and the Node Manager.

To disable host name verification, complete these steps:

1. Expand the **Environment** node in the Oracle WebLogic Server Administration Console.

2. Select **Servers**. The Summary of Servers page appears.
3. Select **WC_Spaces1** (represented as a hyperlink) from the Names column of the table. The Settings page appears.
4. Select the **SSL** tab.
5. Expand the **Advanced** section of the page.
6. Set Hostname Verification to **None**.
7. Repeat these steps for the WC_Spaces2, WC_Portlet1, WC_Portlet2, WC_Collaboration1, WC_Collaboration2, WC_Utilities1, and WC_Utilities2 managed servers.

6.5 Starting Node Manager on SOAHOST1

Make sure that Node Manager was started on SOAHOST1. If this is not the case, start Node Manager:

```
SOAHOST1> cd WL_HOME/server/bin
SOAHOST1> ./startNodeManager.sh
```

6.6 Propagating the Domain Changes to the Managed Server Domain Directory

As described in Section 2–2, "Directory Structure," we need to separate the Administration Server domain directory from the managed server directories. In this step, we propagate the changes from one to the other. To propagate the start scripts and classpath configuration from the Administration Server's domain directory to the managed server domain directory, complete these steps:

1. Create a copy of the managed server domain directory and the managed server applications directory.
2. Move these directories using the following command (both commands :

   ```
   mv ORACLE_BASE/admin/<domain_name>/mserver/apps ORACLE_BASE/admin/<domain_
   name>/mserver/appsbackup

   mv ORACLE_BASE/admin/<domain_name>/mserver/<domain_name> ORACLE_
   BASE/admin/<domain_name>/mserver/>domain_name>backup
   ```

3. Run the `pack` command on SOAHOST1 to create a template pack using the following commands:

   ```
   SOAHOST1> cd MW_HOME/wc/common/bin

   SOAHOST1> ./pack.sh -managed=true -domain=ORACLE_BASE/admin/<domain_
   name>/aserver/<domain_name> -template=wcdomaintemplateExtWC.jar -template_
   name=wc_domain_templateExtWC
   ```

4. Run the `unpack` command on SOAHOST1 to `unpack` the propagated template to the domain directory of the managed server using the following command:

   ```
   SOAHOST1> ./unpack.sh -domain=ORACLE_BASE/admin/<domain_name>/mserver/<domain_
   name>/ -template=wcdomaintemplateExtWC.jar -overwrite_domain=true -app_
   dir=ORACLE_BASE/admin/<domain_name>/mserver/apps
   ```

6.7 Propagating the Domain Configuration to SOAHOST2, WCHOST1, and WCHOST2 Using the unpack Utility

To propagate the domain configuration, complete these steps:

> **Note:** If the Middleware homes are shared between systems, the domain template should already be in the proper directory and you can skip step 1 below.

1. Run the following commands on SOAHOST1 to copy the template file created earlier to SOAHOST2, WCHOST1, and WCHOST:

```
SOAHOST1> scp wcdomaintemplate.jar
       oracle@SOAHOST2:MW_HOME/wc/common/bin

SOAHOST1> scp wcdomaintemplate.jar
       oracle@WCHOST1:MW_HOME/wc/common/bin

SOAHOST1> scp wcdomaintemplate.jar
       oracle@WCHOST2:MW_HOME/wc/common/bin
```

2. Run the `unpack` command on SOAHOST2, WCHOST1, and WCHOST2 to unpack the propagated template.

```
SOAHOST2> cd MW_HOME/wc/common/bin

SOAHOST2> ./unpack.sh
   -domain=ORACLE_BASE/admin/domain_name/mserver/domain_name/
   -app_dir=ORACLE_BASE/admin/domain_name/mserver/applications
```

3. Repeat the above steps for WCHOST1 and WCHOST2.

6.8 Starting the Node Manager on WCHOST1 and WCHOST2

To start the Node Manager on WCHOST1 and WCHOST2, follow these steps:

> **Note:** If the Middleware homes are shared between the systems, and SOA was configured earlier, the `nodemanager.properties` file should already exist, properly configured. If this is the case, perform step 2 only if Node Manager is not already running.

1. Run the `setNMProps.sh` script, located in the *ORACLE_COMMON_HOME*/common/bin directory, to set the `StartScriptEnabled` property to 'true' before starting Node Manager on both WCHOST1 and WCHOST2:

```
WCHOSTn> cd ORACLE_COMMON_HOME/common/bin
WCHOSTn> ./setNMProps.sh
```

2. Start Node Manager:

```
WCHOST1> cd WL_HOME/server/bin
WCHOST1> ./startNodeManager.sh

WCHOST2> cd WL_HOME/server/bin
WCHOST2> ./startNodeManager.sh
```

6.9 Starting the WC_Spaces1, WC_Portlet1, and WC_Collaboration1 Managed Servers on WCHOST1

Follow these steps to start the WC_Spaces1, WC_Portlet1, and WC_Collaboration1 managed servers:

1. Access the Administration Console at `http://ADMINVHN:7001/console`.
2. Click **Servers**.
3. Open the **Control** tab.
4. Select **WC_Spaces1**, **WC_Portlet1**, and **WC_Collaboration1**.
5. Click **Start**.

> **Note:** ADMINVHN is the virtual hostname that maps to the virtual IP where the Administration Server is listening (in SOAHOST1).

6.10 Validating the WC_Spaces1, WC_Portlet1, and WC_Collaboration1 Managed Servers

1. Check that the managed servers are accessible by testing the following URLs:
   - `http://WCHOST1:9000/webcenter`
   - `http://WCHOST1:9001/portalTools`
   - `http://WCHOST1:9002/owc_discussions`
   - `http://WCHOST1:9001/wsrp-tools`
2. Check that all deployments are active. In the Administration Console, select **Deployments**. If any failed, check the log files for any errors. The log files can be found at `ORACLE_BASE/admin/<domain_name>/mserver/<domain_home/servers/[server_name]/logs`.

6.11 Starting the WC_Spaces2, WC_Portlet2, and WC_Collaboration2 Managed Servers on WCHOST2

Follow these steps to start the WC_Spaces2, WC_Portlet2, and WC_Collaboration2 managed servers:

1. Access the Administration Console at `http://ADMINVHN:7001/console`.
2. Click **Servers**.
3. Open the **Control** tab.
4. Select **WC_Spaces2**, **WC_Portlet2**, **and WC_Collaboration2**.
5. Click **Start**.

6.12 Validating the WC_Spaces2, WC_Portlet2, and WC_Collaboration2 Managed Servers

1. Check that the managed servers are accessible by testing the following URLs:
   - `http://WCHOST1:9000/webcenter`
   - `http://WCHOST1:9001/portalTools`

- http://WCHOST1:9002/owc_discussions
- http://WCHOST1:9001/wsrp-tools

2. Check that all deployments are active. In the Administration Console, select **Deployments**. If any failed, check the log files for any errors. The log files can be found at ORACLE_BASE/admin/<domain_name>/mserver/<domain_home/servers/[server_name]/logs.

6.13 Setting Up the Java Object Cache

The Java Object Cache (JOC) should be configured among all the servers running WebCenter Spaces. This local cache is provided to increase the performance of Oracle WebCenter Spaces.

The Java Object Cache can be configured using the MW_HOME/oracle_common/bin/configure-joc.py script. This is a Python script which can be used to configure JOC in the managed servers. The script runs in WLST online mode and expects Administration Server to be up and running.

> **Note:** After configuring the Java Object Cache using the wlst commands or *configure-joc.py* script, all affected managed servers should be restarted for the configurations to take effect.

Usage

1. Connect to the Administration Server using the command-line Oracle WebLogic Scripting Tool (WLST), for example:

```
MW_HOME/wc/common/bin/wlst.sh
$ connect()
```

   Enter the Oracle WebLogic Administration user name and password when prompted.

2. After connecting to the Administration Server using wlst, start the script using the execfile command, for example:

```
wls:/mydomain/serverConfig>execfile('FMW_HOME/oracle_
common/bin/configure-joc.py')
```

3. Configure JOC for all the managed servers for a given cluster.

   Enter 'y' when the script prompts whether you want to specify a cluster name, and also specify the cluster name and discover port, when prompted. This discovers all the managed servers for the given cluster and configure the JOC. The discover port is common for the entire JOC configuration across the cluster. For example:

```
Do you want to specify a cluster name (y/n) <y>
Enter Cluster Name : Spaces_Cluster
Enter Discover Port : 9988
```

   Here is a walkthrough for using configure-joc.py for HA environments:

```
execfile('MW_HOME/oracle_common/bin/configure-joc.py')
.
Enter Hostnames (eg host1,host2) : WCHOST1, WCHOST2
.
Do you want to specify a cluster name (y/n) <y>y
.
```

```
Enter Cluster Name : Spaces_Cluster
.
Enter Discover Port : 9988
.
Enter Distribute Mode (true|false) <true> : true
.
Do you want to exclude any server(s) from JOC configuration (y/n) <n> n
```

The script can also be used to perform the following JOC configurations:

- Configure JOC for all specified managed servers.

  Enter 'n' when the script prompts whether you want to specify a cluster name, and also specify the managed server and discover port, when prompted. For example:

  ```
  Do you want to specify a cluster name (y/n) <y>n
  Enter Managed Server and Discover Port (eg WC_Spaces1:9988, WC_Spaces2:9988) :
  WC_Spaces1:9988,WC_Spaces2:9988
  ```

- Exclude JOC configuration for some managed servers.

  The script allows you to specify the list of managed servers for which the JOC configuration "DistributeMode" will be set to 'false'. Enter 'y' when the script prompts whether you want to exclude any servers from JOC configuration, and enter the managed server names to be excluded, when prompted. For example:

  ```
  Do you want to exclude any server(s) from JOC configuration (y/n) <n>y
  Exclude Managed Server List (eg Server1,Server2) : WC_Spaces1,WC_Spaces3
  ```

- Disable the distribution mode for all managed servers.

  The script allows you to disable the distribution to all the managed servers for a specified cluster. Specify 'false' when the script prompts for the distribution mode. By default, the distribution mode is set to 'true'.

Verify JOC configuration using the CacheWatcher utility. See *Oracle Fusion Middleware High Availability Guide*.

You can configure the Java Object Cache (JOC) using the **HA Power Tools** tab in the Oracle WebLogic Administration Console as described in the *Oracle Fusion Middleware High Availability Guide*.

6.14 Converting Discussions Forum from Multicast to Unicast

To convert Discussions Forum from multicast to unicast, add the relevant startup parameters:

1. In the Oracle WebLogic Server Administration Console, select **Servers**, **WC_Collaboration1**, **Configuration**, and then **Server Start**.
2. In the Arguments box, add the following:

   ```
   -Dtangosol.coherence.wka1=WCHost1  -Dtangosol.coherence.wka2=WCHost2
   -Dtangosol.coherence.localhost=WCHost1 -Dtangosol.coherence.wka1.port=8089
   -Dtangosol.coherence.wka2.port=8089 -Dtangosol.coherence.localport=8089
   ```

   Where **WCHost1** is where **WC_Collaboration1** is running.

   Port 8089 is a port reserved for WebCenter Coherence communications.
3. Repeat steps 1 and 2 for WC_Collaboration2, swapping WCHost1 for WCHost2 and WCHost2 for WCHost1.

4. Restart the WC_Collaboration servers.

6.15 Configuring Clustering for Discussions Server

If this is a Unicast cluster, first ensure that the steps in Section 6.14, "Converting Discussions Forum from Multicast to Unicast" are performed first.

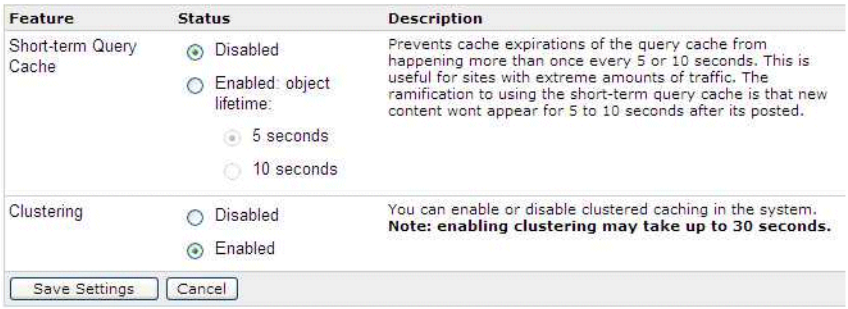
Ensure that all members of the Discussions Server cluster can communicate with each other using the Discussions Server Administration Console:

1. Login to each member of the cluster at:

   http://<host>:<port>/owc_discussions/admin

2. Go to **Cache Settings**.

Figure 6–1 Cache Settings Section



Discussions Server Administration Console

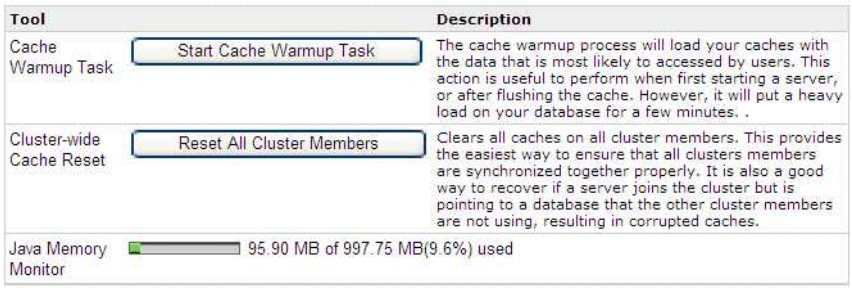
****

3. At the bottom of the page, in the **Cache Features** section, ensure that **Clustering** is set to **Enabled**.

   The top of the page should now list all members of the cluster.

4. Again, towards the end of the page, under the **Cache Tools** section, do **Cluster wide cache reset and the Cache warm up Task**. Repeat the Cache warm up task on all members of the cluster.

Figure 6–2 Cache Tools Section



Discussions Server Administration Console

****

6.16 Configuring the Analytics Collectors

The Analytics Collectors must be configured to communicate with WebCenter Spaces. Each Collector is configured to only communicate with the local WebCenter Spaces in a 1-1 relationship.

Note: Clustered Analytics Collectors are not supported for collecting WebCenter events.

6.16.1 Configure the Collectors

The Collectors do not need to be configured. By default they are listening on localhost. You must configure only the WebCenter Spaces clients to send their messages to localhost.

6.16.2 Configure the WebCenter Spaces Servers

1. Open the WLST shell:

   ORACLE_HOME/common/bin/wlst.sh

2. Connect to WLS Server:

   ```
   connect('weblogic_admin_username', 'weblogic_admin_pwd', 'WCHOST1:9000')
   ```

   Note that you are connecting to the host and port of the Spaces Server.

3. Create the Analytics Collector connection and make it the default connection:

   ```
   createAnalyticsCollectorConnection('webcenter','HAConn1',isUnicast=1,
   collectorHost='localhost',collectorPort=31314,isEnabled=1,timeout=30,default=1)
   ```

4. List the changes made:

   ```
   listDefaultAnalyticsCollectorConnection('webcenter')
   ```

6.17 Configuring Activity Graph

Activity Graph should run as a singleton. In a cluster environment, all but one instance of Activity Graph should be disabled.

To disable Activity Graph:

1. Log in to the Administration Console.
2. Shut down the WC_Spaces and WC_Utilities servers.
3. Select **Deployments**
4. Click **Lock & Edit**.
5. Alter the targets for these three deployments:
   - activitygraph-engines (11.1.1.4.0)
   - oracle.webcenter.activitygraph.enginelib (11.1.1,11.1.1)
   - oracle.webcenter.activitygraph.lib (11.1.1,11.1.1)
6. For each of the deployments above:
   a. Select the deployment.

b. Select the **Targets** tab.

c. Click **Change Targets**.

d. Ensure that the deployment is only targeted to **Part of the Cluster/one of the Managed Servers**.

e. Click **OK** to save the changes.

7. When finished with all three deployments, **Activate all Changes**.
8. Start up the WC_Utilities and WC_Spaces servers.

Since Activity Graph is only running on one node, if this node is lost, or the Managed Server is not available, Activity Graph will be unavailable.

In the case of node failure, Activity Graph can be manually deployed on any other available Managed Server in the cluster.

6.18 Configuring WebCenter REST APIs

Before you use the WebCenter REST APIs, you must perform the server-side configurations described in this section.

1. Connect to the Administration Server using the command-line Oracle WebLogic Scripting Tool (WLST), for example:

```
MW_HOME/wc/common/bin/wlst.sh
```

2. Run the following WLST commands to configure the credential store:

```
createCred(map="o.webcenter.jf.csf.map", key="keygen.algorithm",
     user="keygen.algorithm", password="AES")
createCred(map="o.webcenter.jf.csf.map", key="cipher.transformation",
     user="cipher.transformation", password="AES/CBC/PKCS5Padding")
```

For more information on REST APIs, see the *Oracle Fusion Middleware Developer's Guide for Oracle WebCenter*.

6.19 Configuring Oracle HTTP Server for the WC_Spaces*n*, WC_Portlet*n*, and WC_Collaboration*n* Managed Servers on WCHOST2

To enable Oracle HTTP Server to route to the WebCenter clusters, you must set the WebLogicCluster parameter to the list of nodes in the cluster. Add the following lines to the *OHS_HOME*/instances/ohs_instance1/config/OHS/ohs1/mod_wl_ohs.conf file on all WEBHOST machines. Keep any previous configuration for the Admin and SOA Servers. Restart all HTTP Servers when finished.

```
# Virtual Host for wc.mycompany.com holds all the external URLs. The Virtual Host
should already exist
# and any existing Location blocks should be kept.

NameVirtualHost *:7777
 <VirtualHost *:7777>
     ServerName https://wc.mycompany.com:443
     ServerAdmin you@your.address
     RewriteEngine On
     RewriteOptions inherit

# Spaces
<Location /webcenter>
     WebLogicCluster wchost1:9000,wchost2:9000
```

```
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

<Location /webcenterhelp>
     WebLogicCluster wchost1:9000,wchost2:9000
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

 <Location /rss>
     WebLogicCluster wchost1:9000,wchost2:9000
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

 <Location /rest>
     WebLogicCluster wchost1:9000,wchost2:9000
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

# Portlet

 <Location /portalTools>
     WebLogicCluster wchost1:9001,wchost2:9001
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

 <Location /wsrp-tools>
     WebLogicCluster wchost1:9001,wchost2:9001
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

# Discussions
 <Location /owc_discussions>
     WebLogicCluster wchost1:9002,wchost2:9002
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

# Personalization

 <Location /wcps>
     WebLogicCluster wchost1:9001,wchost2:9001
     SetHandler weblogic-handler
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>

#Activity Graph
```

```
#The WebLogicHost below should be set to the Host on which ActivityGraph is
running.

 <Location /activitygraph-engines>
     WebLogicHost wchost1
     WebLogicPort 9003
     WLProxySSL ON
     WLProxySSLPassThrough ON
</Location>
</VirtualHost>

# Virtual host entry for internal http URL. This should already be in the config
file. The new Location blocks go inside of it

NameVirtualHost *:7777

 <VirtualHost *:7777>
     ServerName wcinternal.mycompany.com:80
     ServerAdmin you@your.address
     RewriteEngine On
     RewriteOptions inherit

# Portlet Internal access

<Location /portalTools>
     WebLogicCluster wchost1:9001,wchost2:9001
     SetHandler weblogic-handler
</Location>

<Location /wsrp-tools>
     WebLogicCluster wchost1:9001,wchost2:9001
     SetHandler weblogic-handler
</Location>

# Discussions Internal access
<Location /owc_discussions>
     WebLogicCluster wchost1:9001,wchost2:9002
     SetHandler weblogic-handler
</Location>
</VirtualHost>
```

The servers specified in the `WebLogicCluster` parameter are only important at startup time for the plug-in. The list needs to provide at least one running cluster member for the plug-in to discover other members of the cluster. Note that the listed cluster member must be running when Oracle HTTP Server is started. Oracle WebLogic Server and the plug-in work together to update the server list automatically with new, failed, and recovered cluster members.

Some example scenarios:

- Example 1: If you have a two-node cluster and then add a third member, you do not need to update the configuration to add the third member. The third member will be discovered on the fly at runtime.
- Example 2: You have a three-node cluster but only two nodes are listed in the configuration. However, if both listed nodes are down when you start Oracle HTTP Server, then the plug-in would fail to route to the cluster. You must ensure that at least one of the listed nodes is running when you start Oracle HTTP Server.

If you list all members of the cluster, then you guarantee you can route to the cluster, assuming at least one member is running when Oracle HTTP Server is started.

For more information on configuring the WebLogic Server plug-in, see the *Oracle Fusion Middleware Using Web Server Plug-Ins with Oracle WebLogic Server* guide.

6.19.1 Virtual Host for the Pagelet Producer

The Pagelet Producer uses the context root of '/'. In order to accommodate this, you must set up a different virtual host.

The required configuration to be made in the Oracle HTTP Server `httpd.conf` file is as follows:

```
<VirtualHost *:7777>
  ServerName pagelet-producer.example.com
  <Location  />
      SetHandler weblogic-handler
      WebLogicCluster wchost1:9000,wchost2:9000
  </Location>
</VirtualHost>
```

All access to Pagelet Producer applications should be through `pagelet-producer.example.com`. For example: When you register a Pagelet Producer in WebCenter Spaces, or a custom application, it should use the virtual host.

Similarly access to Pagelet Producer administration applications and access to any Pagelet Producer resources should be through the virtual host.

Configure the load balancer with a new virtual host - `wcedg-pagelet.mycompany.com` which routes to the virtual host pagelet-producer.example.com which is configured on all Oracle HTTP Servers.

In addition, this virtual host should be configured with appropriate Single-Sign-On protection. For more details see Section 30.6, "Configuring SSO with Virtual Hosts" in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*

6.19.2 Configuring Microsoft Office Clients

In order to accommodate Microsoft Office Clients, refer to the overview and detailed steps outlined in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

In particular, you must create another Virtual Host in order to provide a separate context root for these clients. For instructions see section 30.6, "Configuring SSO with Virtual Hosts" in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*

Follow the steps in section 30.5, "Configuring SSO for Microsoft Clients" in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*to properly configure Windows authentication services.

6.20 Validating Access Through Oracle HTTP Server

Verify that you can access these URLs:

- `http://webhostN:7777/webcenter`
- `http://webhostN:7777/webcenterhelp`

- http://webhostN:7777/rss
- http://webhostN:7777/portalTools
- http://webhostN:7777/wsrp-tools
- http://webhostN:7777/owc_discussions

where 'webhostN' specifies the name of each Oracle HTTP Server host (for example, WEBHOST1,WEBHOST2).

6.21 Validating Access Through the Load Balancer

Verify that you can access these URLs:

- https://wc.mycompany.com/webcenter
- https://wc.mycompany.com/webcenterhelp
- https://wc.mycompany.com/rss
- https://wc.mycompany.com/portalTools
- https://wc.mycompany.com/wsrp-tools
- https://wc.mycompany.com/owc_discussions

6.22 Backing Up the Installation

After you have verified that the extended domain is working, back up the installation. This is a quick backup for the express purpose of immediate restore in case of problems in the further steps. The backup destination is the local disk. This backup can be discarded once the enterprise deployment setup is complete. At this point, the regular deployment-specific backup and recovery process can be initiated. The *Oracle Fusion Middleware Administrator's Guide* provides further details. For information on describing the Oracle HTTP Server data that must be backed up and restored, refer to the "Backup and Recovery Recommendations for Oracle HTTP Server" section in this guide. For information on how to recover components, see "Recovery of Components" and "Recovery After Loss of Component" sections in the guide. For recommendations specific to recovering from the loss of a host, see the "Recovering Oracle HTTP Server to a Different Host" in the guide. Also refer to the *Oracle Database Backup and Recovery Guide* for information on database backup.

To back up the installation a this point, complete these steps:

1. Back up the web tier:
   a. Shut down the instance using opmnctl.

      ```
      ORACLE_BASE/admin/<instance_name>/bin/opmnctl stopall
      ```

   b. Back up the Middleware Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web.tar $MW_HOME
      ```

   c. Back up the Instance Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web_instance.tar $ORACLE_INSTANCE
      ```

   d. Start the instance using opmnctl:

      ```
      ORACLE_BASE/admin/<instance_name>/bin/opmnctl startall
      ```

2. Back up the database. This is a full database backup (either hot or cold) using Oracle Recovery Manager (recommended) or OS tools such as `tar` for cold backups if possible.
3. Back up the AdminServer domain directory. Perform a backup to save your domain configuration. The configuration files all exist under the `ORACLE_BASE/admin/<domain_name>` directory.

   ```
   SOAHOST1> tar -cvpf edgdomainback.tar ORACLE_BASE/admin/<domain_name>
   ```

7

Setting Up Node Manager

This chapter describes how to configure Node Manager according to Enterprise Deployment recommendations. Oracle recommends using host name verification for the communications between Node Manager and the Administration Server. This requires the use of certificates for the different addresses communicating with the Administration Server. In this chapter, the steps for configuring SOAHOST1 and SOAHOST2 certificates for host name verification are provided. Similar steps are required for WCHOST1 and WCHOST2. Although the appropriate host name changes in the steps are required for WCHOST1 and WCHOST2, the procedure and syntax are exactly the same.

Oracle also recommends placing your Oracle Fusion Middleware deployment's NodeManager's log in a different location from the default (which is inside the MW_Home where Node Manager is located). See Section 7.2, "Changing the Location of Node Manager Log" for details.

This chapter includes the following sections:

7.1 About the Node Manager

The Node Manager enables you to start and stop the Administration Server and the managed servers.

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.

7.2 Changing the Location of Node Manager Log

Edit the `nodemanager.properties` file located in the *MW_HOME*/wlserver_10.3/common/nodemanager directory. Add the new location for the LogFile. Oracle recommends locating this file out of the MW_HOME directory, and inside the admin directory for the deployment using the following command:

```
LogFile=ORACLE_BASE/admin/nodemanager.log
```

Restart Node Manager for the change to take effect.

7.3 Enabling Host Name Verification Certificates for Node Manager in SOAHOST1

Perform these steps to set up host name verification certificates for communication between the Node Manager and the Administration Server.

- Step 1: Generating Self-Signed Certificates Using the utils.CertGen Utility
- Step 2: Creating an Identity Keystore Using the utils.ImportPrivateKey Utility
- Step 3: Creating a Trust Keystore Using the Keytool Utility
- Step 4: Configuring Node Manager to Use the Custom Keystores

7.3.1 Generating Self-Signed Certificates Using the utils.CertGen Utility

Follow these steps to create self-signed certificates on SOAHOST1.mycompany.com. These certificates should be created using the network name/alias. When a server is using a virtual hostname it is implied that the server can be migrated from one node to another. Consequently, the directory where keystores and trust keystores are maintained ideally must be located on a shared storage that is accessible from the failover node. For information on using trust CA certificates instead, see "Configuring Identity and Trust" in *Oracle Fusion Middleware Securing Oracle WebLogic Server*.

1. Set up your environment by running the `WL_HOME/server/bin/setWLSEnv.sh` script:

   In the Bourne shell, run the following command:

   ```
   SOAHOST1> . setWLSEnv.sh
   ```

   Verify that the CLASSPATH environment variable is set:

   ```
   SOAHOST1> echo $CLASSPATH
   ```

2. 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). In this case, SOAHOST2 uses the cert directory created for SOAHOST1 certificates. Create a user-defined directory for the certificates.

   ```
   SOAHOST1> mkdir certs
   ```

3. Change directory to the user-defined directory.

   ```
   SOAHOST1> cd certs
   ```

4. Run the `utils.CertGen` tool from the user-defined directory to create the certificates for both SOAHOST1 and ADMINVHN.

   Syntax:

   ```
   java utils.CertGen <key_passphrase> <cert_file_name> <key_
   file_name> [export | domestic] [hostname]
   ```

   Examples:

   ```
   SOAHOST1> java utils.CertGen welcome1 SOAHOST1.mycompany.com_cert
   SOAHOST1.mycompany.com_key domestic SOAHOST1.mycompany.com

   SOAHOST1> java utils.CertGen welcome1 ADMINVHN.mycompany.com_cert
   ADMINVHN.mycompany.com_key domestic ADMINVHN.mycompany.com
   ```

7.3.2 Creating an Identity Keystore Using the utils.ImportPrivateKey Utility

Follow these steps to create an Identity Keystore on SOAHOST1.mycompany.com.

1. Create a new identity keystore called *appIdentityKeyStore* using the utils.ImportPrivateKey utility.

   Create this keystore under the same directory as the certificates (that is, `ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/certs`).

   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.

   Import the certificate and private key for both SOAHOST1 and VIPHOST1 into the Identity Store. Make sure that you use a different alias for each of the certificate/key pair imported.

   Syntax:

   ```
   java utils.ImportPrivateKey <keystore_file> <keystore_
   password> <certificate_alias_to_use> <private_key_passphrase>
   <certificate_file> <private_key_file> [<keystore_type>]
   ```

   Examples:

   ```
   SOAHOST1> java utils.ImportPrivateKey appIdentityKeyStore.jks welcome1
              appIdentity1 welcome1
              ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/SOAHOST1_
   cert.pem
              ORACLE_BASE/admin/domain_name/aserver/domain_namecerts/SOAHOST1_
   key.pem

   SOAHOST1> java utils.ImportPrivateKey appIdentityKeyStore.jks welcome1
              appIdentity2 welcome1
              ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/VIPHOST1_
   cert.pem
              ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/VIPHOST1_
   key.pem
   ```

7.3.3 Creating a Trust Keystore Using the Keytool Utility

Follow these steps to create the Trust Keystore on SOAHOST1.mycompany.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
   ORACLE_BASE/admin/<domain_name>/aserver/<domain_
   name>/certs/appTrustKeyStore.jks
   ```

2. The default password for the standard Java keystore is `changeit`. Oracle recommends always changing the default password. Use the keytool utility to do this. The syntax is:

   ```
   keytool -storepasswd -new <NewPassword> -keystore <TrustKeyStore> -storepass
   <Original Password>
   ```

   For example:

   ```
   keytool -storepasswd -new welcome1 -keystore appTrustKeyStore.jks -storepass
   changeit
   ```

3. 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. This CA certificate must be imported into the `appTrustKeyStore` using the keytool utility. The syntax is:

   ```
   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
   welcome1
   ```

7.3.4 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` file located in the `WL_HOME/common/nodemanager` directory:

```
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 on each node. For
example on SOAHOST1, use appIdentity1, and on VIPHOST1, use appIdentity2.
Example for Node 1:
KeyStores=CustomIdentityAndCustomTrust
CustomIdentityKeyStoreFileName=ORACLE_BASE/admin/<domain_name>/aserver/<domain_
name>/certs/appIdentityKeyStore.jks
CustomIdentityKeyStorePassPhrase=welcome1
CustomIdentityAlias=appIdentity1
CustomIdentityPrivateKeyPassPhrase=welcome1
```

The passphrase entries in the `nodemanager.properties` file get encrypted when you start Node Manager as described in Section 7.4, "Starting the Node Manager on SOAHOST1." For security reasons, you want to minimize the time the entries in the

`nodemanager.properties` file are left unencrypted. After you edit the file, you should start Node Manager as soon as possible so that the entries get encrypted.

When using a common/shared storage installation for MW_HOME, Node Manager is started from different nodes using the same base configuration (nodemanager.properties). In that case, it is required to add the certificate for all the nodes that share the binaries to the appIdentityKeyStore.jks identity store. To do this, create the certificate for the new node and import it to appIdentityKeyStore.jks as described above. Once the certificates are available in the store, each node manager needs to point to a different identity alias to send the correct certificate to the Administration Server. To do this, set different environment variables before starting Node Manager in the different nodes:

```
SOAHOST1> cd WL_HOME/server/bin
SOAHOST1>export JAVA_OPTIONS=-DCustomIdentityAlias=appIdentitySOAHOST1

SOAHOSTn> cd WL_HOME/server/bin
SOAHOSTn> export JAVA_OPTIONS=-DCustomIdentityAlias=appIdentitySOAHOSTn
```

7.4 Starting the Node Manager on SOAHOST1

You must start the Node Manager if it is not already running, and restart it if it is running.

To stop the Node Manager use a Unix kill command.

Run these commands to start Node Manager on SOAHOST1:

> **Note:** If you have not configured and started Node Manager for the first time yet, run the *setNMProps.sh* script as specified in section Section 4.6, "Starting Node Manager on SOAHOST1." This will enable the use of the start script which is required for SOA.

```
SOAHOST1> cd WL_HOME/server/bin
SOAHOST1> ./startNodeManager.sh
```

7.5 Enabling Host Name Verification Certificates for the Node Manager in SOAHOST2

Perform these steps to set up SSL for communication between the Node Manager and the Administration Server:

- Step 1: Generating Self-Signed Certificates Using the utils.CertGen Utility
- Step 2: Creating an Identity Keystore Using the "utils.ImportPrivateKey" Utility
- Step 3: Configuring Node Manager to Use the Custom Keystores

7.5.1 Generating Self-Signed Certificates Using the utils.CertGen Utility

Follow these steps to create self-signed certificates on SOAHOST2.mycompany.com. These certificates should be created using the network name/alias.

1. Set up your environment by running the `WL_HOME/server/bin/setWLSEnv.sh` script:

   In the Bourne shell, run the following command:

   ```
   SOAHOST2> . setWLSEnv.sh
   ```

Verify that the CLASSPATH environment variable is set:

```
SOAHOST2> echo $CLASSPATH
```

2. The directory where keystores and trust keystores are maintained must be on shared storage that is accessible from all nodes so that when the Administration Server or SOA servers fail over, (manually or with server migration), the appropriate certificates can be accessed. In this case, SOAHOST2 uses the cert directory created for SOAHOST1 certificates. If you are maintaining duplicated stores, create user-defined directory for the certificates.

   ```
   SOAHOST2> mkdir certs
   ```

3. Change directory to the user-defined directory.

   ```
   SOAHOST2> cd certs
   ```

4. Run the utils.CertGen tool from the user-defined directory to create the certificates for both SOAHOST2 and ADMINHOST.

   Syntax:

   ```
   java utils.CertGen key_passphrase cert_file_name key_file_
   name [export | domestic] [hostname]
   ```

   Examples:

   ```
   SOAHOST2> java utils.CertGen welcome1 SOAHOST2_cert SOAHOST2_key
               domestic SOAHOST2.mycompany.com

   SOAHOST2> java utils.CertGen welcome1 VIPHOST1_cert VIPHOST1_key
               domestic ADMINVHN.mycompany.com
   ```

7.5.2 Creating an Identity Keystore Using the "utils.ImportPrivateKey" Utility

Follow these steps to create an Identity Keystore on SOAHOST2.mycompany.com.

The procedures described in the previous sections created an Identity keystore that resides in a shared storage. In this section new keys for SOAHOST2 are added to the store. Import the certificate and private key for both SOAHOST2 and SOAHOST2VHN1 into the Identity Store. Make sure you use a different alias for each of the certificate/key pairs imported.

Syntax:

```
java utils.ImportPrivateKey <keystore_file> <keystore_password>
<certificate_alias_to_use> <private_key_passphrase>
<certificate_file> <private_key_file> [<keystore_type>]
```

Examples:

```
SOAHOST2> java utils.ImportPrivateKey appIdentityKeyStore.jks welcome1
            appIdentity1 welcome1
            ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/SOAHOST2_
cert.pem
            ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/SOAHOST2_
key.pem

SOAHOST2> java utils.ImportPrivateKey appIdentityKeyStore.jks welcome1
            appIdentity2 welcome1
            ORACLE_BASE/admin/domain_name/aserver/domain_name/certs/SOAHOST2VHN1 _
cert.pem
```

ORACLE_BASE/admin/*domain_name*/aserver/*domain_name*/certs/SOAHOST2VHN1 _
key.pem

7.5.3 Configuring Node Manager to Use the Custom Keystores

Follow these steps to configure the Node Manager to use the custom keystores.

1. Add the following lines to the end of the `nodemanager.properties` file located in the `WL_HOME/common/nodemanager` directory.

   ```
   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` on each node. For example on SOAHOST2, use "appIdentity2", and on VIPHOST1, use "appIdentity2".

   Example for Node 1:

   ```
   KeyStores=CustomIdentityAndCustomTrust

   CustomIdentityKeyStoreFileName=ORACLE_BASE/admin/<domain_
   name>/aserver/<domain_name>/certs/appIdentityKeyStore.jks

   CustomIdentityKeyStorePassPhrase=welcome1

   CustomIdentityAlias=appIdentity1

   CustomIdentityPrivateKeyPassPhrase=welcome1
   ```

   Note: The passphrase entries in the `nodemanager.properties` file get encrypted when you start Node Manager, as described in Section 7.6, "Starting the Node Manager on SOAHOST2."

   For security reasons, you want to minimize the time the entries in the `nodemanager.properties` file are left unencrypted. After you edit the file, you should start Node Manager as soon as possible so that the entries get encrypted.

7.6 Starting the Node Manager on SOAHOST2

You must start the Node Manager if it is not already running, and restart it if it is running.

To stop the Node Manager use a Unix kill command.

Run these commands to start Node Manager on SOAHOST2:

Note: If you have not configured and started Node Manager for the first time yet, run the *setNMProps.sh* script as specified in section Section 4.15, "Starting Node Manager on SOAHOST2." This will enable the use of the start script which is required for SOA.

```
SOAHOST2> cd WL_HOME/server/bin
SOAHOST2> ./startNodeManager.sh
```

7.7 Enabling Host Name Verification Certificates for Node Manager in WCHOST1 and WCHOST2

Repeat the steps in Section 7.5, "Enabling Host Name Verification Certificates for the Node Manager in SOAHOST2," and Section 7.6, "Starting the Node Manager on SOAHOST2," substituting WCHOST1 and WCHOST2 for SOAHOST2, to configure SSL for the node managers on these machines.

7.8 Configuring WebLogic Servers to Use the Custom Keystores

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, select the "**Custom Identity and Custom Trust**" method for storing and managing private keys/digital certificate pairs and trusted CA certificates.
6. In the **Identity** section, define attributes for the identity keystore.
   a. **Custom Identity Keystore**: Enter the fully qualified path to the identity keystore:

      ORACLE_BASE/admin/*domain_name*/aserver/*domain_name*/certs/appIdentityKeyStore.jks

      Note: The example directory path given in this step is an example. Oracle does not recommend putting keystores into the `aserver` directory, but recommends putting the keystore is shared storage. Having a separate directory for certificates is a better solution.

   b. **Custom Identity Keystore Type**: Leave this field blank, it defaults to JKS.
   c. **Custom Identity Keystore Passphrase**: Enter the password *Keystore_Password* you provided in Section 7.3.2, "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:
   a. **Custom Trust Keystore**: Enter the fully qualified path to the trust keystore:

      ORACLE_BASE/admin/*domain_name*/aserver/*domain_*

`name/certs/appTrustKeyStore.jks`

b. **Custom Trust Keystore Type**: Leave this field blank, it defaults to JKS.

c. **Custom Trust Keystore Passphrase**: The password you provided in as *New_Password* in Section 7.3.3, "Creating a Trust Keystore Using the Keytool 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.

8. Click **Save**.
9. To activate these changes, in the Change Center of the Administration Console, click **Activate Changes**.
10. Select **Configuration**, then **SSL**.
11. 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 Section 7.3.2, "Creating an Identity Keystore Using the utils.ImportPrivateKey Utility."
12. Click **Save**.
13. Click **Activate Changes** in the Administration Console's Change Center to make the changes take effect.
14. Restart the server for which the changes have been applied.

Execute these steps for the Administration Server, the WLS_WSMn, the WLS_SOAn, WLS_Utilities, WLS_Collaboration, WLS_Spaces and WLS_Portlet servers.

8

Configuring External Services

Configuring external services involves establishing a connection from the WebLogic domain to the location of the external service. This chapter describes how to configure the services using WebCenter Spaces or the WebLogic scripting tool (WLST).

This chapter contains the following sections:

8.1 Configuring the Discussion Forum Connection

The discussion forum connection can be configured using either WebCenter Spaces or via the WebLogic Scripting Tool (WLST):

8.1.1 Configuring Discussions using WebCenter Spaces

For additional information on configuring Discussions Server connections, see Chapter 12 "Managing the Announcements and Discussions Services" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

The required values for the WebCenter Enterprise Deployment configuration are as follows:

- Server URL: **http://wcinternal.mycompany.com/owc_discussions**
- Admin User: **the discussions server admin user name**
- Admin Password: **the discussions server admin password**

8.1.2 Configuring Discussions using WLST

To configure discussions via the WebLogic Scripting Tool, complete these steps:

1. Start the WebLogic Scripting Tool:

```
WCHOST1> MW_HOME/wc/common/bin/wlst.sh
```

2. In WLST, connect as the administrator:

```
> connect('weblogic','admin password','ADMINVHN:7001',server='wc_spaces1')
```

3. Create the forum connection as follows, using WLST.

```
>
createDiscussionForumConnection(appName='webcenter',name='Jive-DiscussionForum'
,url=DF_URL,adminUser=DF_USER,default=true,server='wc_spaces1')
```

8.1.3 Creating a Discussions Server Connection for WebCenter From EM

To create a Discussions Server connection for WebCenter from Enterprise Manager:

1. Ensure that at least one of the WebCenter Spaces Managed Servers is running.
2. Log on to the Enterprise Manager Fusion Middleware Control Console at `http://SOAHOST1:7001/em`.
3. From the menu on the left, select **Farm_wcedg_domain**, **WebCenter**, **WebCenter Spaces**, and then **webcenter(11.1.1.4.0) (wc_spaces1)**to go to the WebCenter Spaces page.
4. From the WebCenter Spaces WebCenter drop-down menu, select **Settings**, and then **Service Configuration**.
5. Click **Discussions and Announcements**, and then on **Add**.
6. In the Add Discussion and Announcement Connection screen, enter the name (DFConnection), service URL (`http://<host>:<port>/owc_discussions`) and administrator user name.
7. Click **OK** to save the settings.
8. Restart the WC_Spaces managed servers.

8.2 Configuring the Instant Messaging and Presence (IMP) Server Connection

For instructions on configuring Instant Messaging and Presence servers, see Section 16.3, "Registering Instant Messaging and Presence Servers" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*

8.3 Configuring the Worklist and Workflow Server Connection

Before configuring the connection to the BPEL Server which will host the Worklist and Workflow application, there are several prerequisites that need to be met:

1. The backend requirements for WebCenter Spaces workflows must be completed. This includes the deployment of WebCenter Spaces workflows. These steps can be found in Chapter 22 "Managing External Applications" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.
2. The keystores for the WebCenter and SOA servers must be generated. In particular, the steps for configurations when SOA and WebCenter are installed in the same domain must be followed. These steps can be found in Chapter 27 "Securing WebCenter Applications and Components with SSL" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

The Worklist Server connection can be configured using either WebCenter Spaces or via the WebLogic Scripting Tool (WLST):

- Section 8.3.1, "Configuring Worklist and Workflow using WebCenter Spaces"
- Section 8.3.2, "Configuring Worklist and Workflow using WLST"

8.3.1 Configuring Worklist and Workflow using WebCenter Spaces

For details on configuring Worklist using WebCenter Spaces, see section 12.5.2.2 of the *WebCenter Administration Guide*. The required values for the WebCenter Enterprise Deployment configuration are as follows:

- SOAP Server URL: **http://wcinternal.mycompany.com**

For details on configuring Workflow, please ensure the prerequisites have been met according to section 4.7 of the *Oracle Fusion Middleware Installation Guide for Oracle WebCenter 11g Release 1 (11.1.1)*. In particular, ensure that WebCenter Spaces Workflow has been deployed on the SOA Server.

8.3.2 Configuring Worklist and Workflow using WLST

To configure Worklist using the WebLogic Scripting Tool, complete these steps:

1. Start the WebLogic Scripting Tool:

   ```
   WCHOST1> MW_HOME/wc/common/bin/wlst.sh
   ```

2. In WLST, connect as the administrator.

   ```
   > connect('weblogic','admin password','ADMINVHN:7001')
   ```

3. Run the following commands in WLST to configure the worklist server connection:

   ```
   > createBPELConnection('webcenter', 'WebCenter-Worklist',
   'http://wcinternal.mycompany.com',server='wc_spaces1')
   > addWorklistConnection('webcenter','WebCenter-Worklist',true,server='wc_
   spaces1')
   > listWorklistConnections('webcenter',false,server='wc_spaces1')
   ```

4. Run the following commands in WLST to configure this same connection as the workflow connection:

   ```
   > setSpacesWorkflowConnectionName('webcenter','WebCenter-Worklist',server='wc_
   spaces1')
   > getSpacesWorkflowConnectionName('webcenter',server='wc_spaces1')
   ```

8.4 Registering the Portlet Producers

The portlet producers can be configured using either WebCenter Spaces or using the WebLogic Scripting Tool (WLST):

- Section 8.4.1, "Configuring the Portlet Producers using WebCenter Spaces"
- Section 8.4.2, "Configuring the Portlet Producers Using WLST"

8.4.1 Configuring the Portlet Producers using WebCenter Spaces

For details on configuring the portlet producers using WebCenter Spaces, see sections 13.2 and 13.3 of the *WebCenter Administration Guide* Chapter 23 "Managing Security" of

the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*. The required values for the WebCenter Enterprise Deployment configuration are as follows:

- WSRP WSDL URL:
  http://wcinternal.mycompany.com/wsrp-tools/portlets/wsrp2?WSDL
- WebClipping URL:
  http://wcinternal.mycompany.com/portalTools/webClipping/providers
- OmniPortlet URL:
  http://wcinternal.mycompany.com/portalTools/omniPortlet/providers

8.4.2 Configuring the Portlet Producers Using WLST

To configure the portlet producers using the WebLogic Scripting Tool, complete these steps:

1. Start the WebLogic Scripting Tool:

   ```
   WCHOST1> MW_HOME/wc/common/bin/wlst.sh
   ```

2. In WLST, connect as the administrator.

   ```
   > connect('weblogic','admin password','ADMINVHN:7001')
   ```

3. Run the following commands in WLST to configure the portlet producers:

   ```
   > registerPDKJavaProducer('webcenter', 'wc-WebClipping1',
   'http://wcinternal.mycompany.com/portalTools/webClipping/providers',
   serviceId='webClipping', timeout=500, establishSession=true ,server='wc_
   spaces1')
   > listPDKJavaProducers('webcenter','wc-WebClipping1',server='wc_spaces1')
   > registerPDKJavaProducer('webcenter', 'wc-OmniPortlet1',
   'http://wcinternal.mycompany.com/portalTools/omniPortlet/providers',
   serviceId='omniPortlet', timeout=500, establishSession=true,server='wc_
   spaces1')
   > listPDKJavaProducers('webcenter',name='wc-OmniPortlet1',server='wc_spaces1')
   > registerWSRPProducer('webcenter', 'wc-WSRPTools1',
   'http://wcinternal.mycompany.com/wsrp-tools/portlets/wsrp2?WSDL',
   timeout=500,server='wc_spaces1')
   > listWSRPProducers('webcenter', 'wc-WSRPTools1',server='wc_spaces1')
   ```

8.5 Configuring Search Services

You can configure Search Services and crawlers using the procedures in Chapter 21 of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

Ensure that:

- The Search Service has been registered with Oracle Internet Directory as described in Section 21.2.2, "Oracle SES - Configuration" in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.
- The Search Service connection has been added and created as a new Service as described in Section 21.3, "Setting Up Oracle SES Connections" in the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.(Section 21.3) WCADM6557

Ensure that any new URLs are added to both the WEBHOST HTTP Server configurations as follows:

```
<Location /rsscrawl>
 WebLogicCluster WCHOST1:9000,WCHOST2:9000
 SetHandler weblogic-handler
```

```
</Location>

<Location /sesUserAuth>
 WebLogicCluster WCHOST1:9000,WCHOST2:9000
 SetHandler weblogic-handler
</Location>
```

9

Installing and Configuring Oracle Universal Content Management

This chapter describes how to extend a domain with Oracle Universal Content Management (Oracle UCM) using the Oracle Fusion Middleware Configuration Wizard.

> **Important:** Oracle strongly recommends reading the release notes for any additional installation and deployment considerations prior to starting the setup process.

This chapter contains the following sections:

9.1 About Adding Oracle UCM to a Domain

The Oracle Enterprise Content Management Suite system is installed using the WL_HOME and ORACLE_HOME locations described in Section 2.3, "Shared Storage and

Recommended Directory Structure." WCHOST1 and WCHOST2 mount MW_HOME and use the existing binary installations.

Oracle UCM is installed using binaries that are shipped with the Enterprise Content Management Suite. Before proceeding, you must install these binaries into the Middleware Home.

1. Start the installer for Oracle Enterprise Content Management Suite from the installation media:

   ```
   ./runInstaller
   ```

   When the installer prompts you for a JRE/JDK location, enter the Oracle JDK location created in the Oracle WebLogic Server installation.

2. In the Welcome screen, click **Next**.
3. In the Prerequisite Checks screen, verify that all checks complete successfully, and click **Next**.
4. Specify the installation location. Select the previously installed Middleware Home from the drop-down list. For the Oracle Home directory, enter the directory name (ecm).

   Click **Next**.
5. In the Installation Summary screen, click **Install**.

   The Oracle Enterprise Content Management Suite software is installed.
6. In the Installation Complete screen, click **Finish**.

9.2 Extending the Domain to Include Oracle UCM

You must extend the domain created in Chapter 4, "Creating a Domain" to include Oracle UCM. Optionally, a new domain may be created containing only Oracle UCM.

> **Note:** Before performing these steps, back up the domain as described in the *Oracle Fusion Middleware Administrator's Guide*.

To extend the domain to include Oracle UCM:

1. Ensure that the database where you installed the repository is running. For Oracle RAC databases, Oracle recommends that all instances are running, so that the validation check later on becomes more reliable.
2. Change the directory to the location of the Oracle Fusion Middleware Configuration Wizard. This is within the common home directory (notice that domain extensions are run from the node where the Administration Server resides).

   ```
   SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
   ```

3. Start the Configuration Wizard:

   ```
   SOAHOST1> ./config.sh
   ```

4. In the Welcome screen, select **Extend an existing WebLogic domain**, and click **Next**.
5. In the WebLogic Domain Directory screen, select the **WebLogic domain directory** (*ORACLE_BASE*/admin/*domain_name*/aserver/*domain_name*), and click **Next**.

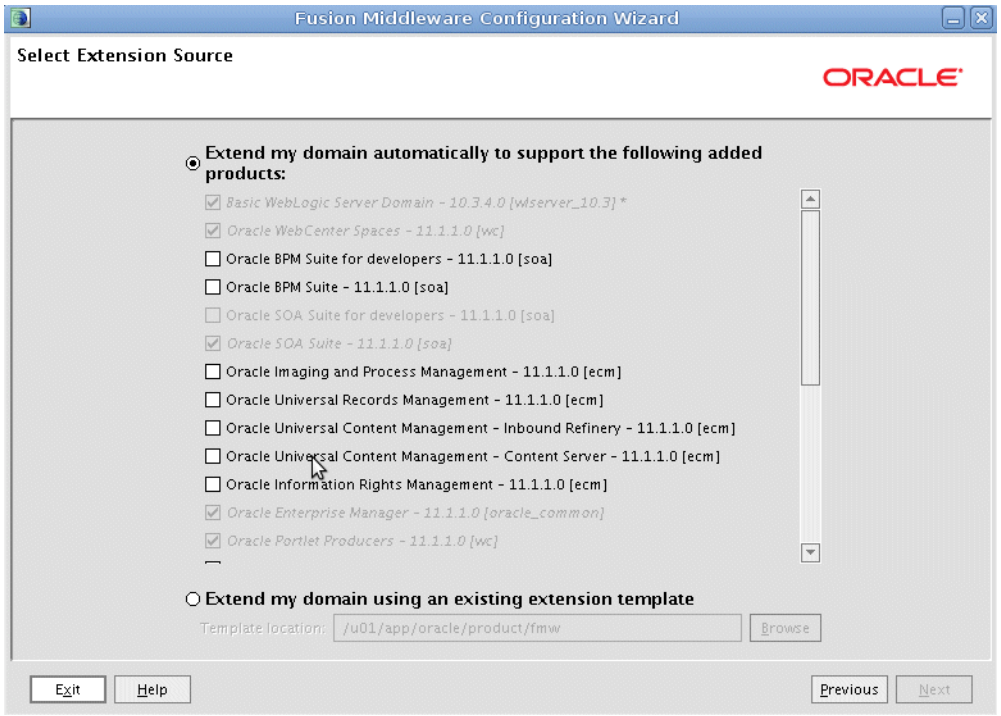
6. The Select Extension Source screen appears. In this screen, do the following (as shown in Figure 9–1):

   - Select **Extend my domain automatically to support the following added products**.
   - Select the following product:
     - **Oracle Universal Content Management - Content Server - 11.1.1.0 ecm**

       (Select the version of Oracle UCM Content Server that appears in the Select Extension Source screen)

   Click **Next**.

Figure 9–1 Select Extension Source screen for Oracle UCM



Select Extension Source screen for Oracle UCM

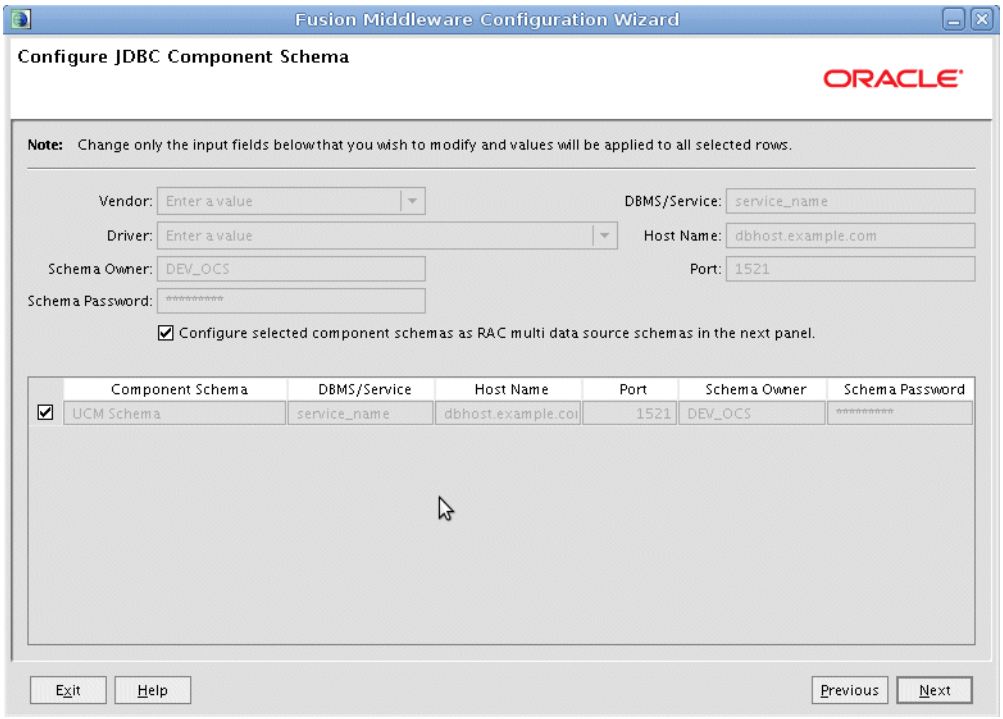
****

7. The Configure JDBC Component Schema screen appears. In this screen, do the following (as shown in Figure 9–2):

   - Select **UCM Schema**.
   - Select **Configure selected component schemas as RAC multi data source schemas in the next panel**.

   Click **Next**.

Figure 9–2 Configure JDBC Component Schema Screen for Oracle UCM



Configure JDBC Component Schema Screen for Oracle UCM

****

8. The Configure RAC Multi Data Sources Component Schema screen appears. In this screen, do the following (as shown in Figure 9–3):

   a. Select **UCM Schema**. Leave the other data sources as they are.

   b. 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 (wcedg.mycompany.com).

      Username: Enter the complete user name (including the prefix) for the schemas. The user names shown in Figure 9–3 assume that DEV was used as the prefix for schema creation from RCU.

      Password: Enter the password to use to access the schemas.

   c. Click **Add** and enter the details for the first Oracle RAC instance.

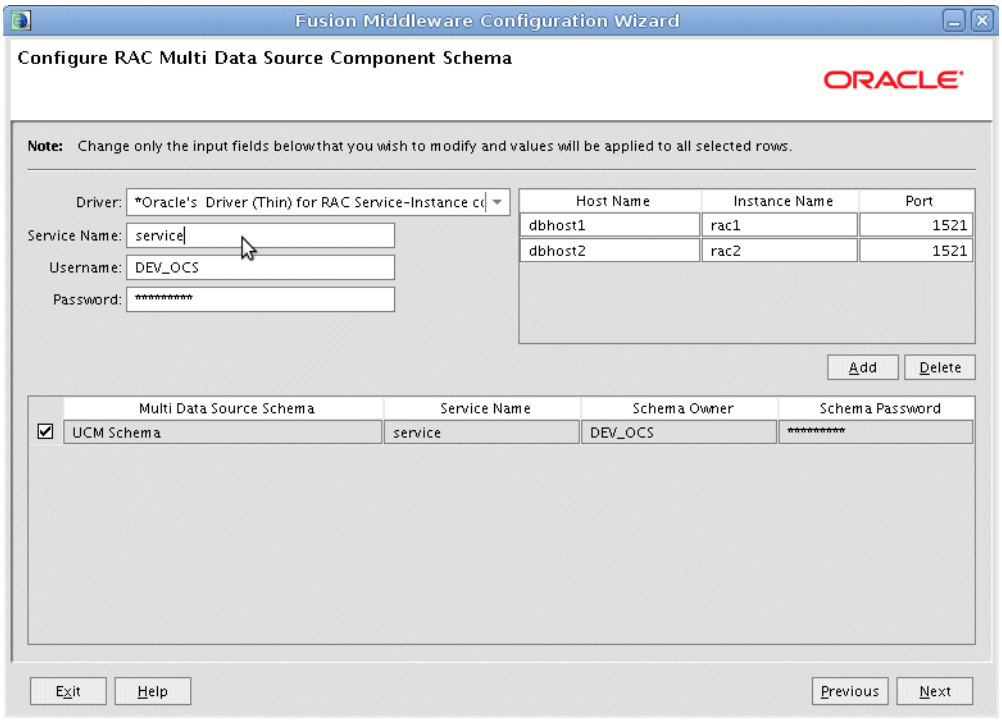
   d. Repeat these steps for each Oracle RAC instance.

   Note: Leave the SOA and WebCenter schemas as they are.

   e. Click **Next**.

      Figure 9–3 Configure RAC Multi Data Source Component Schema Screen for Oracle UCM

Figure 9–3 Configure RAC Multi Data Source Component Schema Screen for Oracle UCM



Configure RAC Multi Data Source Component Schema Screen for Oracle UCM

****

9. In the Test JDBC Data Sources screen, the connections should be 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.

10. In the Optional Configuration screen, select the following:

    - **Managed Servers, Clusters and Machines**
    - **Deployment and Services**

    Click **Next**.

11. In the Configure Managed Servers screen, click **Add** to add the required managed servers as shown in Table 9–1. Do not modify the other servers that appear in this screen; leave them as they are.

Table 9–1 Managed Servers

Name	Listen Address	Listen Port	SSL Listen Port	SSL Enabled
WC_UCM1	WCHOST1	16200	n/a	No
WC_UCM2	WCHOST2	16200	n/a	No

Click **Next**.

12. In the Configure Clusters screen, click **Add** to add the clusters as shown in Table 9–2. Do not modify the other clusters that appear in this screen; leave them as they are.

Table 9–2 Clusters

Name	Cluster Messaging Mode	Multicast Address	Multicast Port	Cluster Address
UCM_Cluster	unicast	n/a	n/a	Leave it empty.

Click **Next**.

13. In the Assign Servers to Clusters screen, add the following. Do not modify the other assignments that appear in this screen; leave them as they are.
    - UCM_Cluster
      - WC_UCM1
      - WC_UCM2

    Click **Next**.
14. In the Configure Machines screen, click the **Unix Machine** tab and add the following two new machines:

Table 9–3 Machines

Name	Node Manager Listen Address
WCHOST1	WCHOST1
WCHOST2	WCHOST2

Leave all other fields to their default values. Click **Next**.

15. In the Assign Servers to Machines screen, assign servers to machines as follows:
    - Assign WC_UCM1 to WCHOST1.
    - Assign WC_UCM2 to WCHOST2.

    Click **Next**.
16. In the Target Deployments to Clusters or Servers screen, click **Next**.
17. In the Target Services to Clusters or Servers screen, click **Next**.
18. In the Configuration Summary screen, click **Extend**.
19. Click **OK** in the warning dialog about conflicts in ports for the domain.
20. In the Creating Domain screen, click **Done**.
21. Restart the Administration Server to make these changes to take effect. See Section 5.4, "Restarting the Administration Server."

9.3 Propagating the Domain Configuration to WCHOST1 and WCHOST2 Using the unpack Utility

Perform these steps to propagate the domain configuration:

1. Run the following command on WCHOST1 to copy the template pack using the following command:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin
SOAHOST1> ./pack.sh -managed=true -domain=ORACLE_BASE/admin/
domain_name/aserver/domain_name -template=edgdomaintemplate.jar -template_
```

```
name=edgdomain_template
```

2. Run the `unpack` command on WCHOST1 to unpack the propagated template.

> **Note:** Make sure to run the unpack command from the *ORACLE_COMMON_HOME*/common/bin directory, not from *WL_HOME*/common/bin.

```
WCHOST1> cd ORACLE_COMMON_HOME/common/bin
WCHOST1> ./unpack.sh -domain=ORACLE_BASE/admin/domain_name
/mserver/domain_name -template=edgdomaintemplate.jar -app_dir=ORACLE_BASE
/admin/domain_name/mserver/applications
```

> **Note:** The *ORACLE_BASE*/admin/*domain_name*/mserver directory must exist before running unpack. In addition, the *ORACLE_BASE*/admin/*domain_name*/mserver/applications must be empty.

3. Repeat steps 1 and 2 for WCHOST2.

9.4 Starting Node Manager on WCHOST1 and WCHOST2

Perform these steps to start Node Manager on WCHOST1 and WCHOST2 if Node Manager has not started already:

1. On each server, run the `setNMProps.sh` script, which is located in the *ORACLE_COMMON_HOME*/common/bin directory, to set the `StartScriptEnabled` property to 'true' before starting Node Manager:

```
WCHOSTn> cd ORACLE_COMMON_HOME/common/bin
WCHOSTn> ./setNMProps.sh
```

> **Note:** You must use the `StartScriptEnabled` property to avoid class loading failures and other problems.

> **Note:** If the Oracle UCM server is sharing the MW_HOME in a local or shared storage with SOA, as suggested in the shared storage configuration described in Chapter 2, "Database and Environment Preconfiguration," it is not required to run `setNMProps.sh` again. In this case, Node Manager has already been configured to use a start script.

2. Run the following commands on both WCHOST1 and WCHOST2 to start Node Manager:

```
WCHOSTn> cd WL_HOME/server/bin
WCHOSTn> ./startNodeManager.sh
```

9.5 Restarting the Administration Server

Restart the Administration Server for these changes take effect. To restart the Administration Server, stop it first using the Administration Console and then start it again as described in Chapter 4.7, "Starting the Administration Server on SOAHOST1."

9.6 Starting and Configuring the WC_UCM1 Managed Server

To start the WC_UCM1 managed server:

1. Use the Oracle WebLogic Server Administration Console as follows:
   a. Expand the **Environment** node in the Domain Structure window.
   b. Choose **Servers**.

      The Summary of Servers screen appears.
   c. Click the **Control** tab.
   d. Select **WC_UCM1** 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. See Section 11.6, "Troubleshooting" for possible causes.

9.6.1 Configuring the WC_UCM1 Managed Server

To configure the WC_UCM1 managed server:

1. Log in to WC_UCM1 at `http://WCHOST1:16200/cs` using your Oracle WebLogic administration user name and password to display a configuration page.

   Note: The UCM configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location for the Oracle WebCenter enterprise deployment is at *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*.

2. Change the following values on the server configuration page. Make sure to select the **Is New Content Server Instance** check box to see all options:
   - **Content Server Instance Folder**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs.
   - **Native File Repository Location**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs/vault.
   - **WebLayout Folder**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs/weblayout.
   - **Server Socket Port**: Set this to 4444.
   - **Socket Connection Address Security Filter**: Set this to a pipe-delimited list of localhost and the server IPs:

     127.0.0.1|*WCHOST1_IP_Address*|*WCHOST2_IP_Address*|*HTTPHOST1_IP_Address*|*HTTPHOST2_IP_Address*

Note: For this step, use IP addresses, not hostnames.

- **WebServer HTTP/HTTPS Address**: Set this to wcedg.mycompany.com:443.
- **Web Address is HTTPS**: Select this check box.
- **Server Instance Label**: Set this to UCM_Cluster1.
- **Server Instance Description**: Set this to Cluster ucm_cluster1.
- **Auto_Number Prefix**: Set this to ucm_cluster1-.

3. Click **Submit** when finished, and restart the managed server using the Oracle WebLogic Server Administration Console.

9.7 Updating the cwallet File in the Administration Server

The Oracle UCM server updates the `cwallet.sso` file located in *ORACLE_BASE*/admin/*domain_name*/mserver/*domain_name*/config/fmwconfig when it starts. You must propagate this change back to the Administration Server. To do this, copy the file to *ORACLE_BASE*/admin/*domain_name*/aserver/*domain_name*/config/fmwconfig in SOAHOST1 using the following command (all on a single line):

```
WCMHOST1> scp ORACLE_BASE/admin/domain_name/mserver/
domain_name/config/fmwconfig/cwallet.sso oracle@SOAHOST1:ORACLE_
BASE
/admin/domain_name/aserver/domain_name/config/fmwconfig/
```

Note: If any operation is performed in the WC_UCM*n* servers that modifies the `cwallet.sso` file in the *ORACLE_BASE*/admin/*domain_name*/mserver/*domain_name*/config/fmwconfig directory, the file must be immediately copied to the Administration Server domain directory on SOAHOST1 at *ORACLE_BASE*/admin/*domain_name*/aserver/*domain_name*/config/fmwconfig.

9.8 Starting and Configuring the WC_UCM2 Managed Server

To start the WC_UCM2 managed server:

1. Using the Oracle WebLogic Server Administration Console as follows:
    1. Expand the **Environment** node in the Domain Structure window.
    2. Choose **Servers**.

       The Summary of Servers page appears.
    3. Click the **Control** tab.
    4. Select **WC_UCM2** 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. See Section 11.6, "Troubleshooting" for possible causes.

9.8.1 Configuring the WC_UCM2 Managed Server

To configure the WC_UCM2 managed server:

1. Log in to WC_UCM2 at `http://WCHOST2:16200/cs` using your Oracle WebLogic administration user name and password to display a configuration page:

   Note: The UCM configuration files are on a shared disk so that all members of the cluster can access them. The shared disk location for the Oracle ECM enterprise deployment is at *ORACLE_BASE*/admin/*wc_domain*/aserver/*ucm_cluster*.

2. Change the following values on the server configuration page:
   - **Content Server Instance Folder**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs
   - **WebLayout Folder**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs/weblayout

     Make sure that the **Is new Content Server Instance?** check box is NOT selected.
   - **Native File Repository Location**: Set this to *ORACLE_BASE*/admin/*wc_domain*/*ucm_cluster*/cs/vault
3. Click **Submit** when finished and restart the managed server using the Oracle WebLogic Server Administration Console.

9.9 Configuring Service Retries for Oracle UCM

Set the following parameter in Oracle Content Server's `config.cfg` file in order to enable login retries during an Oracle RAC failover:

```
ServiceAllowRetry=true
```

If this value is not set, you are required to manually retry any operation that was in progress when the failover began.

To add the configuration parameter for Oracle UCM:

1. Go to the WebLogic Server Administration Console for Oracle UCM at `http://WCHOST1:16200/cs`, and log in using your Oracle WebLogic administration user name and password.
2. Open the Administration page, and then choose **Admin Server**. The Content Admin Server page appears.
3. Click **General Configuration** on the left. The General Configuration page appears.
4. In the **Additional Configuration Variables** box, add the following parameter:

   ```
   ServiceAllowRetry=true
   ```

5. Click **Save** and restart all UCM managed servers.

Note: The new parameter is included in the `config.cfg` file, which is at the following location:

ORACLE_BASE/admin/*wc_domain*/*ucm_cluster*/cs/config/config.cfg

You can also edit this file directly in a text editor. Do not forget to restart all UCM managed servers.

9.10 Configuring Oracle HTTP Server for the WC_UCM Managed Servers

To enable Oracle HTTP Server to route to UCM_Cluster, which contains the WC_UCM1 and WC_UCM2 managed servers, you must set the `WebLogicCluster` parameter to the list of nodes in the cluster:

1. On WEBHOST1 and WEBHOST2, add the following lines to the *ORACLE_BASE*/admin/*instance_name*/config/OHS/*component_name*/mod_wl_ohs.conf file:

   UCM

```
<Location /cs>
    WebLogicCluster WCHOST1:16200,WCHOST2:16200
    SetHandler weblogic-handler
    WLCookieName IDCCS_SESSIONID
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

<Location /adfAuthentication>
    WebLogicCluster WCHOST1:16200,WCHOST2:16200
    SetHandler weblogic-handler
    WLCookieName IDCCS_SESSIONID
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>

<Location /login>
    WebLogicCluster WCHOST1:16200,WCHOST2:16200
    SetHandler weblogic-handler
    WLCookieName IDCCS_SESSIONID
    WLProxySSL ON
    WLProxySSLPassThrough ON

</Location>

<Location /_ocsh>
    WebLogicCluster WCHOST1:16200,WCHOST2:16200
    SetHandler weblogic-handler
    WLCookieName IDCCS_SESSIONID
    WLProxySSL ON
    WLProxySSLPassThrough ON
</Location>
```

2. Restart Oracle HTTP Server on both WEBHOST1 and WEBHOST2.

```
 WEBHOST1> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
ias-component=ohs1

WEBHOST2> ORACLE_BASE/admin/instance_name/bin/opmnctl restartproc
```

```
ias-component=ohs2
```

9.11 Validating Access Through Oracle HTTP Server

You should verify URLs to ensure that appropriate routing and failover is working from Oracle HTTP Server to UCM_Cluster. Perform these steps to verify the URLs:

1. While WC_UCM2 is running, stop WC_UCM1 using the Oracle WebLogic Server Administration Console.
2. Access `http://WEBHOST1:7777/cs` to verify it is functioning properly.
3. Start WC_UCM1 from the Oracle WebLogic Server Administration Console.
4. Stop WC_UCM2 from the Oracle WebLogic Server Administration Console.
5. Access `http://WEBHOST1:7777/cs` to verify it is functioning properly.

9.12 Backing Up the Installation

After you have verified that the extended domain is working, back up the installation. This is a quick backup for the express purpose of immediate restore in case of problems in the further steps. The backup destination is the local disk. You can discard this backup once the enterprise deployment setup is complete. At that point, the regular deployment-specific backup and recovery process can be initiated. The *Oracle Fusion Middleware Administrator's Guide* provides further details. For information on describing the Oracle HTTP Server data that must be backed up and restored, refer to the "Backup and Recovery Recommendations for Oracle HTTP Server" section in that guide. For information on how to recover components, see the "Recovery of Components" and "Recovery After Loss of Component" sections in the guide. For recommendations specific to recovering from the loss of a host, see the "Recovering Oracle HTTP Server to a Different Host" section in the guide. Also refer to the Oracle Database Backup and Recovery Guide *Oracle Database Backup and Recovery User's Guide* for information on database backup.

Perform these steps to back up the installation:

1. Back up the Web tier:
   a. Shut down the instance using opmnctl.

      ```
      SOAHOST1> ORACLE_BASE/admin/instance_name/bin/opmnctl stopall
      ```

   b. Back up the Middleware Home on the Web tier using the following command (as root):

      ```
      SOAHOST1> tar -cvpf BACKUP_LOCATION/web.tar MW_HOME
      ```

   c. Back up the Oracle Instance Home on the Web tier using the following command:

      ```
      SOAHOST1> tar -cvpf BACKUP_LOCATION/web_instance_name.tar ORACLE_INSTANCE
      ```

   d. Start the instance using opmnctl:

      ```
      SOAHOST1> cd ORACLE_BASE/admin/instance_name/bin
      SOAHOST1> opmnctl startall
      ```

2. Back up the database. This is a full database backup (either hot or cold) using Oracle Recovery Manager (recommended) or operating system tools such as tar for cold backups if possible.
3. Back up the Administration Server domain directory to save your domain configuration. The configuration files all exist in the *ORACLE_BASE*/admin/*domain_name* directory:
4. Run the following command to create the backup:

```
SOAHOST1> tar -cvpf edgdomainback.tar ORACLE_BASE/admin/domain_name
```

9.13 Configure Oracle Content Server for Oracle WebCenter

This section describes tasks required for configuring Oracle Content Server that enable features for Oracle WebCenter. This section includes the following:

- Section 9.13.1, "Configure Folder_g and WebCenterConfigure Components"
- Section 9.13.2, "Enable Folders_g component" -
- Section 9.13.3, "Enable and configure Dynamic Converter component"-
- Section 9.13.4, "Enable the 'WebCenterConfigure' component"

9.13.1 Configure Folder_g and WebCenterConfigure Components

To configure the Folder_g and WebCenterConfigure components:

1. Log into Oracle Content Server Admin page using your Oracle WebLogic administration user name and password.
2. Click the **Administration** tray in the portal navigation bar.

   The Administration selections appear.
3. Click **Admin Server**.
4. Go to the **Component Manager** page.
5. Click **All Features**.

   All components from the Document Management, Folders, Inbound Refinery, Integration, and Web Content Management categories appear.
6. Select the checkbox for all components.
7. Click **Update**.
8. Restart Content Server. Optionally, Content Server may be restarted after all the configuration steps in Section 9.13 have been completed.

You may optionally enable other components with this procedure. For more information, see Section 11.2.1, "Oracle Content Server Prerequisites" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

9.13.2 Enable Folders_g component

The Folders_g component provides hierarchical folder interface to content in Oracle Content Server. To Enable the Folders_g component:

1. Log onto Oracle Content Server.
2. Select **Admin Server**, **Component Manager** , and then click the **Folders_g** checkbox.

3. Click **Save/Update** at the bottom.
4. Restart Content Server. Optionally, Content Server may be restarted after all the configuration steps in Section 9.13 have been completed.

9.13.3 Enable and configure Dynamic Converter component

The Dynamic Converter component configures an instance of Oracle Content Server with an Oracle WebCenter application. It sets configuration settings and adds services. This enables the Slide Previewer capability and HTML renditions in Oracle WebCenter.

1. Log onto Oracle Content Server:
2. Select **Administration**, **Admin Server**, and then **Enable DynamicConverter**.
3. Restart Oracle Content server
4. Set the file types to be sent to the Dynamic Converter:
   a. Select **Administration**, **Dynamic Converter Admin**, **Configuration Settings**, and then **Conversion Formats**.
   b. Select each file format from the drop down list, for example, Word, Excel, PowerPoint, or PDF.

   Note: the 'Dynamic Converter Admin' menu option will not be visible until you have bounced the UCM after installing the 'Dynamic Converter' component

   c. Click the **Update** button at the bottom of the page.

9.13.4 Enable the 'WebCenterConfigure' component

The WebCenterConfigure component creates and uses an account named **WCILS** for item level security.

To enable the WebCenterConfigure component:

1. Log onto Oracle Content Server.
2. Select **Administration**, **Admin Server** and then Component Manager.
3. -> Click on the WebCenterConfigure checkbox, click the Save/Update button at the bottom
4. Restart Content Server. Optionally, Content Server may be restarted after all the configuration steps in Section 9.13 have been completed.

9.14 Registering Oracle Content Server with Oracle WebCenter

To register a content repository:

1. Log in to Enterprise Manager Fusion Middleware Control and navigate to the home page for WebCenter Spaces.
2. From the **WebCenter** menu, choose **Settings**, and then **Service Configuration**.
3. From the list of services on the WebCenter Service Configuration page, select **Content Repository**.
4. To connect to a new content repository, click **Add**.

5. Enter a unique name for this connection, specify the content repository type, and indicate whether this connection is the active (or default) connection for the application.

   - **Connection Name**

     Enter a unique name for this content repository connection. The name must be unique (across all connection types) within the WebCenter application.

   - **Repository Type**

     Choose the type of repository to which you want to connect: **Oracle Content Server**.

   - **Active Connection**

     Make this the default content repository for your WebCenter application.

     You can connect your WebCenter application to multiple content repositories; all connections are used. One connection must be designated the default (or active) connection.

6. Enter additional details for the WebCenter Spaces repository:

   - **Content Administrator**

     Enter a user name with administrative rights for this Oracle Content Server instance. This user is used to create and maintain folders for WebCenter Spaces content and manage content access rights. Defaults to `sysadmin`. Administrative privileges are required for this connection so that operations can be performed on behalf of WebCenter users.

   - **Spaces Root**

     Enter the root folder under which all group spaces content is stored. Specify a content repository folder that does not yet exist and use the format: `/foldername`. For example: `/MyWebCenterSpaces`. The spacesRoot cannot be `/`, the root itself, and it must be unique across applications. The folder specified is created for you when the WebCenter application starts up.

   - **Application Name**

     Enter a unique name for this WebCenter Spaces application within this content repository. For example: **MyWCS**

     The name must begin with an alphabetical character, followed by any combination of alphanumeric characters or the underscore character. The string must be less than or equal to thirty characters.

     This name is used to separate data when multiple WebCenter Spaces applications share the same content repository and should be unique across applications.

7. Enter connection details for the content repository:

   - **RIDC Socket Type**

     Choose: **Socket** - Uses an intradoc socket connection to connect to the Oracle Content Server. The client IP address must be added to the list of authorized addresses in the Oracle Content Server. In this case, the client is the machine on which Oracle WebCenter is running.

   - **Server Host**

     Enter the host name of the machine where the Oracle Content Server is running. For example: **wchost1.mycompany.com**

- **Server Port**

  Enter the port on which the Oracle Content Server listens: **4444**

- **Connection Timeout (ms)**

  Specify the length of time allowed to log in to Oracle Content Server (in milliseconds) before issuing a connection timeout message. If no timeout is set, there is no time limit for the login operation. Choose a reasonable timeout depending on your environment. For example: **30000**.

- **Authentication Method**

  Choose: **Identity Propagation** - Oracle Content Server and the WebCenter application use the same identity store to authenticate users.

8. Click **OK** to save this connection.
9. To start using the new (active) connection you must restart the managed server on which the WebCenter application is deployed.

For more information on managing the content repository, see Chapter 11, "Managing Content Repositories" of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

9.15 Installing and Configuring the Inbound Refinery

The Inbound Refinery (IBR) is required for Document Conversion by Oracle UCM. The actual number of IBRs varies depending on requirements. Oracle recommends, for availability reasons, installing at least two IBRs. These are installed on separate machines, outside of the enterprise deployment topology.

9.15.1 Install Inbound Refinery

This guide does not document the detailed procedures for installing Inbound Refinery. Depending on load and the number of document conversions, the number of Inbound Refineries vary.

9.15.1.1 Overview

You can install Inbound Refineries within the same domain as Content Server, or in a separate domain. All communication from Content Servers to Inbound Refineries takes place through the configured network ports.

For the examples in this guide, we assume that the Inbound Refineries are installed as part of a separate domain. The following restrictions apply:

- No more than one Inbound Refinery per domain per machine can be installed.
- Inbound Refinery instances that are on separate machines must ensure that their configuration is all local and not on shared disk.

This latter requirement is important to remember if and when Inbound Refinery instances are installed onto machines where there are existing Content Server installations. Whereas configuration in a Content Server cluster MUST be shared, configuration information of Inbound Refinery instances MUST NOT be shared with other Inbound Refinery instances.

Inbound Refinery instances are not clusterable in any meaningful sense. They operate completely independently.

Note: See Section 7.8, "Configuring WebLogic Servers to Use the Custom Keystores" for configuring Inbound Refinery Servers to use Custom Keystores.

9.15.1.2 Installation Steps

You can configure a Content Server with one or more Inbound Refinery instances, and the same Inbound Refinery can act as a provider to one or more Content Servers. For information on configuring Inbound Refinery instances, refer to *Oracle Fusion Middleware Administrator's Guide for Conversion*.

To install and configure Inbound Refineries:

1. Use the Configuration Wizard that was used to create Oracle UCM.
2. Select the option for installing the Inbound Refinery.
3. Create one or more Inbound Refinery Managed Servers.
4. Create a cluster and add all the Inbound Refinery Managed Servers to the cluster.
5. Ensure that each Inbound Refinery Managed Server resides on a separate machine.

When finished, follow the Configuration steps in Section 9.15.2 for EVERY Inbound Refinery created.

An Inbound Refinery needs only to be accessed once through HTTP in order to initialize its configuration. This can be done directly, at the Managed Server's listen address. An Inbound Refinery should not be placed behind an HTTP Server.

All subsequent access to an Inbound Refinery is through the socket listener. This listener is protected through the Incoming Socket Connection Address Security Filter configured in the next section.

9.15.2 Configuring Inbound Refinery

Oracle recommends configuring each Content Server with all Inbound Refineries. The process for configuring Oracle UCM is to add an Inbound Refinery as a provider. There are also post-installation steps that must be performed with the IBR.

The following sections describe the procedures for post-installation configuration of the Inbound Refinery:

- Section 9.15.2.1, "Configure Inbound Refinery settings"
- Section 9.15.2.2, "Configure Document Conversion"
- Section 9.15.2.3, "Configuring Oracle UCM with the Inbound Refinery"

9.15.2.1 Configure Inbound Refinery settings

Access the IBR post-installation configuration screen at the following URL:

`http://IBRHOST:port/ibr`

1. Select a socket port, for example, `5555`.

   This port is used later when configuring Oracle UCM.
2. For **Incoming Socket Connection Address Security Filter**, add the IP addresses of all the Oracle UCM hosts.
3. Take note of the value for **Server Instance Name**, you will need it later in the process. You can change it to a more useful name, if you wish.

4. Restart the IBR server.

Log onto the Inbound Refinery at the following URL:

`http://IBRHOST:port/ibr`

1. Select **Administration**, and then **Admin Server**.
   a. Enable **PDFExportConverter**.
   b. Click **Update**.
   c. Bounce the server.
   d.
2. Select **Conversion Settings**, **Primary Web Renditions**, and then check **Convert to PDF using PDF Export**.
3. Select **Conversion Settings**, **Additional Renditions**, and then check **Create Thumbnail Images using Outside In**.
4. Select **Conversion Settings**, **Third Party Application Settings**, **General OutsideIn Filter Options**, and then select **Options**.

   When you select Options, a separate pop-up window appears.

   a. Set the **Path to fonts** to the fonts on the IBR system.

      For many conversions, the IBR needs access to a directory with usable TrueType fonts. On a Windows machine, the default Windows fonts in `C:\WINDOWS\Fonts` will work. On a Linux machine, you may have fonts in a directory, for example: `/usr/share/X11/fonts/TTF`.

   b. Select **Use internal graphics rendering** under **UNIX Rendering Options**.
   c. Click **Update**.

      When finished, restart the Administration server and all Inbound Refineries, then follow the configuration steps.

9.15.2.2 Configure Document Conversion

Once Inbound Refineries and Content Server are installed and deployed, additional configuration steps are needed before the Content Server sends jobs to the IBR for conversion. This is a brief outline; For more information, see *Oracle Fusion Middleware System Administrator's Guide for Oracle Content Server*.

Select primary web-viewable conversion

Go to **Conversion Settings** and select **Primary Web Rendition**. This page selects which conversion IBR attempts to perform on files it receives from a Content Server. The conversions available depend on which components are enabled on the IBR. With no components, the only option is **Convert to multi-page Tiff using Outside In**. If no conversions are selected, files are not converted. To select conversions, select them and click **Update**.

9.15.2.3 Configuring Oracle UCM with the Inbound Refinery

Log into Oracle UCM:

1. Select **Administration**, and then **Providers**.
2. Add an outgoing provider.

3. Enter the details for your IBR instance, including, name, description, host, server port (IBRs intradoc port), context root, and instance name.

   The IBR instance name is obtained from the IBR server. To find the instance name do the following:

   a. Log into the IBR.

   b. Select **Administration**, and then **Configuration for <instanceName>**.

   Note: if you miss this step, you will not see the **Refinery Administration** menu item in the **Administration** menu.

4. Check **Handles Inbound Refinery Conversion Jobs**.

5. Restart the Content Server.

6. Set the file types to be sent to the IBR:

   a. Select **Administration**, **Refinery Administration** and then **File Formats Wizard**.

   b. Check the boxes for the appropriate file types to send to the refinery.

10

Integration With Oracle Identity Management

This chapter describes how to integrate Oracle WebCenter with Oracle Identity Management. It contains the following sections:

10.1 Credential and Policy Store Configuration

The following topics describe credential and policy store configuration in detail:

10.1.1 Overview of Credential and Policy Store Configuration

Oracle Fusion Middleware allows using different types of credential and policy stores in a WebLogic domain. Domains can use stores based on an XML file or on different types of LDAP providers. When a domain uses an LDAP store, all policy and credential data is kept and maintained in a centralized store. However, when using XML policy stores, the changes made on Managed Servers are not propagated to the Administration Server unless they use the same domain home. The Oracle Fusion Middleware WebCenter Enterprise Deployment topology uses different domain homes for the Administration Server and the Managed Server, thus Oracle requires the use of an LDAP store as policy and credential store for integrity and consistency. By default Oracle WebLogic Server domains use an XML file for the policy store. The following sections describe the steps required to change the default store to Oracle Internet Directory LDAP for credentials or policies.

Note: The backend repository for the policy store and the credential store must use the same kind of LDAP server. To preserve this coherence, note that reassociating one store implies reassociating the other one, that is, the reassociation of both the credential and the policy stores is accomplished as a unit using the Enterprise Manager or the WLST command `reassociateSecurityStore`. For more information, see Section 10.1.4, "Reassociation of Credentials and Policies."

10.1.2 Credential Store Configuration

A credential store is a repository of security data (credentials). A credential can hold user name and password combinations, tickets, or public key certificates. Credentials are used during authentication, when principals are populated in subjects, and, further, during authorization, when determining what actions the subject can perform. In this section, steps are provided to configure Oracle Internet Directory LDAP as a credential store for the Oracle Fusion Middleware WebCenter Enterprise Deployment topology. For more details on credential store configuration, refer to the "Configuring the Credential Store" chapter in the *Oracle Fusion Middleware Security Guide*.

The following section describe credential store configuration:

- Section 10.1.2.1, "Creating the LDAP Authenticator"
- Section 10.1.2.2, "Moving the WebLogic Administrator to LDAP"
- Section 10.1.2.3, "Reassociating the Domain Credential Store"

10.1.2.1 Creating the LDAP Authenticator

To be safe, before you create the LDAP authenticator, you should first back up the relevant configuration files:

```
ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/config/config.xml
ORACLE_BASE/admin/<domain_name>/aserver/<domain_
name>/config/fmwconfig/jps-config.xml
ORACLE_BASE/admin/<domain_name>/aserver/<domain_
name>/config/fmwconfig/system-jazn-data.xml
```

Also back up the `boot.properties` file in the *ORACLE_BASE*/admin/*domain_name*/aserver/*domain_name*/servers/AdminServer/security directory for the Administration Server.

To configure the credential store to use LDAP, set the proper authenticator using the WebLogic Server Console:

1. Log in to the WebLogic Server Console.
2. Click the **Security Realms** link on the left navigational bar.
3. Click the **myrealm** default realm entry to configure it.
4. Open the **Providers** tab within the realm.
5. Observe that there is a `DefaultAuthenticator` provider configured for the realm.
6. Click the **New** button to add a new provider.
7. Enter a name for the provider such as **OIDAuthenticator** or **OVDAuthenticator** depending on whether Oracle Internet Directory or Oracle Virtual Directory will be used.

8. Select the **OracleInternetDirectoryAuthenticator** or **OracleVirtualDirectoryAuthenticator** type from the list of authenticators depending on whether Oracle Internet Directory or Oracle Virtual Directory will be used.
9. Click **OK**.
10. In the Providers screen, click the newly created Authenticator.
11. Set the control flag to **SUFFICIENT**. This indicates that if a user can be authenticated successfully by this authenticator, then it 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 flag set to **SUFFICIENT**; in particular, check the DefaultAuthenticator and set that to **SUFFICIENT**.
12. Click **Save** to save this setting.
13. Open the **Provider Specific** tab to enter the details for the LDAP server.
14. Enter the details specific to your LDAP server, as shown in the following table:

Parameter	Value	Value Description
Host	For example: `oid.mycompany.com`	The LDAP server's server ID.
Port	For example: `636`	The LDAP server's port number.
Principal	For example: `cn=orcladmin`	The LDAP user DN used to connect to the LDAP server.
Credential	NA	The password used to connect to the LDAP server
SSL Enabled	Checked	Specifies whether SSL protocol is used when connecting to LDAP server.
User Base DN	For example: `cn=users,dc=us,dc=mycompany,dc=com`	Specify the DN under which your Users start.
Group Base DN	For example: `cn=groups,dc=us,dc=mycompany,dc=com`	Specify the DN that points to your Groups node.
Use Retrieved User Name as Principal	Checked	Must be turned on.

Click **Save** when done.

15. Click **Activate Changes** to propagate the changes.

10.1.2.1.1 Setting the Order of Providers Reorder the OID/OVD Authenticator and Default Authenticator and ensure that the control flag for each authenticator is set in the following order:

1. OID LDAP Authenticator: **SUFFICIENT**
2. Default Authenticator: **SUFFICIENT**

10.1.2.2 Moving the WebLogic Administrator to LDAP

This section provides details for provisioning a new administrator user and group for managing the Oracle Fusion Middleware WebCenter WebLogic Domain. This section describes the following tasks:

- Section 10.1.2.2.1, "Provisioning Admin Users and Groups in an LDAP Directory"
- Section 10.1.2.2.2, "Assigning the Admin Role to the Admin Group"
- Section 10.1.2.2.3, "Updating the boot.properties File and Restarting the System"

10.1.2.2.1 Provisioning Admin Users and Groups in an LDAP Directory As mentioned in the introduction to this section, users and groups from multiple WebLogic domains may be provisioned in a central LDAP user store. In such a case, there is a possibility that one WebLogic admin user may have access to all the domains within an enterprise. This is not a desirable situation. To avoid this, the users and groups provisioned must have a unique distinguished name within the directory tree. In this guide, the admin user and group for the WebCenter Enterprise Deployment WebLogic domain will be provisioned with the DNs below:

- Admin User DN:

  ```
  cn=weblogic_wc,cn=Users,dc=us,dc=mycompany,dc=com
  ```

- Admin Group DN:

  ```
  cn=WC_Administrators,cn=Groups,dc=us,dc=mycompany,dc=com
  ```

Follow these steps to provision the admin user and admin group in Oracle Internet Directory:

1. Create an ldif file named `admin_user.ldif` with the contents shown below and then save the file:

   ```
   dn: cn=weblogic_wc, cn=Users, dc=us, dc=mycompany, dc=com
   orclsamaccountname: weblogic_wc
   givenname: weblogic_wc
   sn: weblogic_wc
   userpassword: Welcome1
   mail: weblogic_wc
   objectclass: top
   objectclass: person
   objectclass: organizationalPerson
   objectclass: inetorgperson
   objectclass: orcluser
   objectclass: orcluserV2
   uid: weblogic_wc
   cn: weblogic_wc
   description: Admin User for the IDM Domain
   ```

2. Run the `ldapadd` command located under the *ORACLE_HOME*`/bin` directory to provision the user in Oracle Internet Directory.

   Note: The Oracle home used here is the Oracle home for the Identity Management installation where Oracle Internet Directory resides.

   For example (the command is shown as two lines in the example below for readability purposes, but you should enter the command on a single line):

   ```
   OIDHOST1> ORACLE_HOME/bin/ldapadd -h oid.mycompany.com -p 389 -D
   ```

```
cn="orcladmin" -w welcome1 -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=WC_Administrators, cn=Groups, dc=us, dc=mycompany, dc=com
displayname: WC_Administrators
objectclass: top
objectclass: groupOfUniqueNames
objectclass: orclGroup
uniquemember: cn=weblogic_wc,cn=users,dc=us,dc=mycompany,dc=com
cn: WC_Administrators
description: Administrators Group for the SOA Domain
```

4. Run the `ldapadd` command located under the `ORACLE_HOME/bin/` directory to provision the group in Oracle Internet Directory (the command is shown as two lines in the example below for readability purposes, but you should enter the command on a single line):

```
OIDHOST1> ORACLE_HOME/bin/ldapadd -h oid.mycompany.com -p 389 -D
cn="orcladmin" -w welcome1 -c -v -f admin_group.ldif
```

10.1.2.2.2 Assigning the Admin Role to the Admin Group After adding the users and groups to Oracle Internet Directory, the group must be assigned the Admin role within the WebLogic domain security realm. This enables all users that belong to the group to be administrators for that domain. Follow these steps to assign the Admin role to the Admin group:

1. Log into the WebLogic Administration Server Console.
2. In the left pane of the console, click **Security Realms**.
3. On the Summary of Security Realms page, click **myrealm** under the Realms table.
4. On the Settings page for myrealm, click the Roles & Policies tab.
5. On the Realm Roles page, expand the Global Roles entry under the Roles table. This brings up the entry for Roles. Click on the **Roles** link to bring up the Global Roles page.
6. On the Global Roles page, click the **Admin** role to bring up the Edit Global Role page:
   a. On the Edit Global Roles page, under the Role Conditions table, click the **Add Conditions** button.
   b. On the Choose a Predicate page, select **Group** from the drop down list for predicates and click **Next**.
   c. On the Edit Arguments Page, specify **WC_Administrators** in the **Group Argument** field and click **Add**.
7. Click **Finish** to return to the Edit Global Role page.
8. The Role Conditions table now shows the WC_Administrators Group as an entry.
9. Click **Save** to finish adding the Admin Role to the WC_Administrators Group.
10. Validate that the changes were successful by bringing up the WebLogic Administration Server Console using a web browser. Log in using the credentials for the weblogic_wc user.

Note: Each SOA application has its own predefined roles and groups defined for administration and monitoring. By default, the "Administrator" group allows these operations. However, the "Administrator" group may be too broad. For example, you may not want B2B Administrators to be WebLogic Server Domain Administrators where SOA is running. Therefore, you may wish to create a a more specific group, such as "SOA Administrators." In order for the different applications to allow the SOA Administrator group to administer the different systems, you must add the required roles to the SOA Administrator group. For example, for B2B's Administration, add the B2BAdmin role to the SOA Administrators group, for Worklistapp's administration, add the SOAAdmin role. Refer to each component's specific roles for the required roles in each case.

10.1.2.2.3 Updating the boot.properties File and Restarting the System

The `boot.properties` file for the Administration Server should be updated with the WebLogic admin user created in Oracle Internet Directory. Follow the steps below to update the `boot.properties` file:

1. On SOAHOST1, go the following directory:

   ```
   SOAHOST1>cd ORACLE_BASE/admin/domainName/aserver/domainName/servers/
   AdminServer/security
   ```

2. Rename the existing `boot.properties` file:

   ```
   SOAHOST1> mv boot.properties boot.properties.backup
   ```

3. Use a text editor to create a file called `boot.properties` under the security directory. Enter the following lines in the file:

   ```
   username=weblogic_wc
   password=welcome1
   ```

4. Save the file.

5. Stop the Administration Server:

   ```
   SOAHOST1> cd ORACLE_BASE/admin/domainName/aserver/domainName/bin
   SOAHOST1> ./stopWebLogic.sh
   ```

6. Restart the Administration Server using the procedure in Section 4.7, "Starting the Administration Server on SOAHOST1."

10.1.2.3 Reassociating the Domain Credential Store

The reassociation of both the Credential and the Policy stores is accomplished as a unit using Enterprise Manager or the WLST command `reassociateSecurityStore`. See Section 10.1.4, "Reassociation of Credentials and Policies" for detailed steps

10.1.3 Policy Store Configuration

The domain policy store is the repository of system and application-specific policies. In a given domain, there is one store that stores all policies that all applications deployed in the domain may use. This section provides the steps to configure Oracle Internet Directory LDAP as the policy store for the Oracle Fusion Middleware WebCenter Enterprise Deployment topology. For more details on policy store

configuration, refer to the "OPSS Authorization and the Policy Store" chapter in the Oracle Fusion Middleware Security Guide. *Oracle Fusion Middleware Security Guide*.

10.1.3.1 Prerequisites to Using an LDAP-Based Policy Store

In order to ensure the proper access to an LDAP server directory (Oracle Internet Directory) used as a policy store, you must set a node in the server directory.

An Oracle Internet Directory administrator must follow these steps to create the appropriate node in an Oracle Internet Directory Server:

1. Create an LDIF file (assumed to be `jpstestnode.ldif` in this example) specifying the following DN and CN entries:

   ```
   dn: cn=jpsroot_wc
   cn: jpsroot_wc
   objectclass: top
   objectclass: OrclContainer
   ```

   The distinguished name of the root node (illustrated by the string `jpsroot_wc` above) must be distinct from any other distinguished name. One root node can be shared by multiple WebLogic domains. It is not required that this node be created at the top level, as long as read and write access to the subtree is granted to the Oracle Internet Directory administrator.

2. Import this data into Oracle Internet Directory server using the command `ldapadd`, as illustrated in the following example (the command is shown as two lines in the example below for readability purposes, but you should enter the command on a single line):

   ```
   OIDHOST1> ORACLE_HOME/bin/ldapadd -h ldap_host -p ldap_port -D
   cn=orcladmin -w password -c -v -f jpstestnode.ldif
   ```

3. Verify that the node has been successfully inserted using the command `ldapsearch`, as illustrated in the following example (the command is shown as two lines in the example below for readability purposes, but you should enter the command on a single line):

   ```
   OIDHOST1> ORACLE_HOME/bin/ldapsearch -h ldap_host -p ldap_port -D
   cn=orcladmin -w password -b "cn=jpsroot_wc" objectclass="orclContainer"
   ```

4. When using Oracle internet Directory as the LDAP-Based Policy Store run the utility `oidstats.sql` in the INFRADBHOSTs to generate database statistics for optimal database performance:

   ```
   ORACLE_HOME/bin/sqlplus
   ```

   Enter ODS as a user name. You will be prompted for credentials for the ODS user. Inside sqlplus, enter the command to gather the statistics info:

   ```
   SQLPLUS> @ORACLE_HOME/ldap/admin/oidstats.sql
   ```

   The `oidstats.sql` utility must be run just once after the initial provisioning. For details about this utility, consult the *Oracle Fusion Middleware User Reference for Oracle Identity Management*.

10.1.3.2 Reassociating the Domain Policy Store

Reassociating the policy store consists in migrating policy data from a file- or LDAP-based repository to an LDAP-based repository, that is, reassociation changes the repository preserving the integrity of the data stored. For each policy in the source

policy store, reassociation searches the target LDAP directory and, if it finds a match, it updates the matching policy as appropriate. If none is found, it simply migrates the policy as is.

At any time, after a domain policy store has been instantiated, a file- or LDAP-based policy store can be reassociated into an LDAP-based policy store storing the same data. To support it, the domain has to be configured, as appropriate, to use an LDAP policy store.

The reassociation of both the credential and the policy stores is accomplished as a unit using Enterprise Manager or the WLST command `reassociateSecurityStore`. See Section 10.1.4, "Reassociation of Credentials and Policies" for detailed steps.

10.1.4 Reassociation of Credentials and Policies

To reassociate the policy and credential store with Oracle Internet Directory, use the WLST `reassociateSecurityStore` command. Follow these steps:

1. From SOAHOST1, start the `wlst` shell:

```
SOAHOST1>cd ORACLE_COMMONHOME/common/bin
SOAHOST1>./wlst.sh
```

2. Connect to the WebLogic Administration Server using the `wlst connect` command shown below:

   Syntax:

```
connect('AdminUser',"AdminUserPassword",t3://hostname:port)
```

   For example:

```
connect("weblogic","welcome1","t3://ADMINVHN:7001")
```

3. Run the `reassociateSecurityStore` command as shown below:

   Syntax:

```
reassociateSecurityStore(domain="domainName",admin="cn=orcladmin",
password="orclPassword",ldapurl="ldap://LDAPHOST:LDAPPORT",servertype="OID",
jpsroot="cn=jpsroot_wc")
```

   For example:

```
wls:/WCEDGDomain/serverConfig>reassociateSecurityStore(domain="soaedg_domain",
admin="cn=orcladmin",password="welcome1",ldapurl="ldap://oid.mycompany.com:389"
,servertype="OID",jpsroot="cn=jpsroot_wc")
```

   The output for the command is shown below:

```
{servertype=OID,jpsroot=cn=jpsroot_wc_idm_idmhost1,admin=cn=orcladmin,
domain=IDMDomain,ldapurl=ldap://oid.mycompany.com:389,password=welcome1}
Location changed to domainRuntime tree. This is a read-only tree with
DomainMBean as the root.

For more help, use help(domainRuntime)

Starting Policy Store reassociation.
LDAP server and  ServiceConfigurator setup done.

Schema is seeded into LDAP server
Data is migrated to LDAP server
Service in LDAP server after migration has been tested to be available
```

```
Update of jps configuration is done
Policy Store reassociation done.
Starting credential Store reassociation
LDAP server and  ServiceConfigurator setup done.
Schema is seeded into LDAP server
Data is migrated to LDAP server
Service in LDAP server after migration has been tested to be available
Update of jps configuration is done
Credential Store reassociation done
Jps Configuration has been changed. Please restart the server.
```

4. Restart the Administration Server after the command completes successfully.

> **Note:** For credential and policy changes to take effect, the servers in the domain must be restarted.

10.1.4.1 Cataloging Oracle Internet Directory Attributes

An Oracle Internet Directory attribute used in a search filter must be indexed. The indexing is an optional procedure used to enhance performance. If not done yet in this OID use the `catalog` tool to index attributes:

```
catalog connect="orcl" add=true attribute="orclrolescope" verbose="true"
```

Optionally, the attribute names can be placed in a file and processed in batch as follows:

```
orclrolescope
orclassignedroles
orclApplicationCommonName
orclAppFullName
orclCSFAlias
orclCSFKey
orclCSFName
orclCSFDBUrl
orclCSFDBPort
orclCSFCredentialType
orclCSFExpiryTime
modifytimestamp
createtimestamp
orcljpsassignee
```

For more information on indexing OID attributes, see *Oracle Fusion Middleware Reference for Oracle Identity Management*.

10.2 Oracle Access Manager 10g Integration

This section describes how to set up Oracle Access Manager 10g as the single sign-on solution for the Oracle WebCenter Enterprise Deployment topology. If you are integrating with Oracle Access Manager 11g, skip this section, follow the steps in Section 10.3, "Oracle Access Manager 11g Integration," and then proceed to Section 10.4, "Configuring WebCenter Applications," and continue on with the rest of this chapter.

This section contains the following topics:

- Section 10.2.1, "Overview of Oracle Access Manager Integration"
- Section 10.2.2, "Prerequisites for Oracle Access Manager"

10.2.1 Overview of Oracle Access Manager Integration

Oracle Access Manager (OAM) is the recommended single sign-on solution for Oracle Fusion Middleware 11*g* Release 1. For more information on installing and configuring an OAM installation, see *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*. This chapter explains the procedure for configuring the WebCenter installation with an existing OAM installation and the underlying directory service. Oracle recommends using either Oracle Internet Directory (OID) or Oracle Virtual Directory (OVD) or both of these directory services.

Note: The WebCenter Enterprise Deployment topology described in this book uses a Single Sign-On configuration where both the WebCenter System and the Single Sign-On System are in the same network domain (mycompany.com) For a multi-domain configuration, please refer to the required configuration steps in "Chapter 7, Configuring Single Sign-On," of the *Oracle Access Manager Access Administration Guide*.

10.2.2 Prerequisites for Oracle Access Manager

The setup for Oracle Access Manager (OAM) assumes an existing OAM installation complete with Access Managers and a policy protecting the Policy Manager. For more information on installing and configuring an OAM installation, see *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*. This setup includes a directory service such as Oracle Internet Directory (OID) either as a stand-alone or as part of an Oracle Virtual Directory (OVD) configuration. This chapter will provide the necessary steps for configuring your WebCenter installation with either OID or OVD.

In addition, the OAM installation should have its own Web server configured with WebGate. This section also provides the steps for using the OAM Web server as a delegated authentication server.

10.2.3 Using the OAM Configuration Tool

The OAM Configuration Tool (oamcfg) starts a series of scripts and setup the required policies. It requires various parameters as inputs. Specifically, it creates the following:

1. A Form Authentication scheme in OAM
2. Policies to enable authentication in WebLogic Server
3. An AccessGate entry in OAM to enable Oracle HTTP Server WebGates (from your Web Tier) to protect your configured application
4. A Host Identifier, depending on the scenario chosen (a default host identifier would be used, if not provided)

5. Policies to protect and unprotect application specific URLs.

This section covers the following topics:

- Section 10.2.3.1, "Collecting the Information for the OAM Configuration Tool"
- Section 10.2.3.2, "Running the OAM Configuration Tool"
- Section 10.2.3.3, "Updating the REST Policies"
- Section 10.2.3.4, "Verifying Successful Creation of the Policy Domain and AccessGate"
- Section 10.2.3.5, "Updating the Host Identifier"
- Section 10.2.3.6, "Updating the WebGate Profile"
- Section 10.2.3.7, "Adding Additional Access Servers"
- Section 10.2.3.8, "Configure Delegated Form Authentication"

10.2.3.1 Collecting the Information for the OAM Configuration Tool

The following information should be collected or prepared prior to running the OAM Configuration tool:

1. **Password:** Create a secure password. This will be used as the password for the WebGate installation created later.
2. **LDAP Host:** Enter the host name of the Directory Server or Load Balancer address in the case of an HA/Enterprise Deployment configuration.
3. **LDAP Port:** Enter the port of the Directory Server.
4. **LDAP USER DN:** Enter the DN of the LDAP admin user. This is a value such as "cn=orcladmin."
5. **LDAP password:** Enter the password of the LDAP admin user.
6. **oam_aa_host:** Enter the host name of an Oracle Access Manager from the Access Server Configuration.
7. **oam_aa_port:** Enter the port of the Oracle Access Manager from the Access Server Configuration.

10.2.3.2 Running the OAM Configuration Tool

The OAM Configuration Tool resides in the `ORACLE_HOME/modules/oracle.oamprovider_11.1.1/` directory (`ORACLE_HOME` will depend on which machine you are running this). The tool can be run from any machine with the required installation files. In this case, we run it from SOAHOST1.

The OAM Configuration Tool should be run as follows (all on a single command line):

```
MW_HOME/jrockit_160_<version>/bin/java -jar oamcfgtool.jar mode=CREATE
app_domain="WebCenter_EDG"
protected_uris="$URI_LIST"
public_uris="$PUBLIC_URI_LIST"
app_agent_password=<Password_to_be_provisioned_for_App_Agent>
ldap_host=OID.MYCOMPANY.COM
ldap_port=389
ldap_userdn="cn=orcladmin"
ldap_userpassword=<Password_of_LDAP_Admin_User>
oam_aaa_host=OAMHOST1
oam_aaa_port=OAMPORT1
```

The `$URI_LIST` and `$PUBLIC_URI_LIST` variables in the above command depend on the topology:

- **WebCenter only:**

  $URI_
  LIST="/webcenter/adfAuthentication,/webcenter/content,/integration/worklistapp,/workflow/sdpmessagingsca-ui-worklist/faces/adf.task-flow,/workflow/WebCenterWorklistDetail/faces/adf.task-flow,/workflow/sdpmessagingsca-ui-worklist,/soa-infra,/rss/rssservlet,/owc_discussion/login!withRedirect.jspa,/owc_discussions/login!default.jspa,/owc_discussions/login.jspa,/owc_discussions/admin,/rest/api/resourceIndex,/rest/api/spaces,/rest/api/discussions,/rest/api/tags,/rest/api/taggeditems,/rest/api/activities,/rest/api/activitygraph,/rest/api/feedback,/rest/api/people,/rest/api/messageBoards,/rest/api/searchresults,/activitygraph-engines,/wcps/api,/pageletadmin,/authenticateWithApplicationServer,/em,/console,/adfAuthentication"

  $PUBLIC_URI_LIST="/webcenter,/owc_
  discussions,/rss,/workflow,/rest/api/cmis,/cs,/"

- **WebCenter and SOA:**

  $URI_
  LIST="/webcenter/adfAuthentication,/webcenter/content,/integration/worklistapp,/workflow/sdpmessagingsca-ui-worklist/faces/adf.task-flow,/workflow/WebCenterWorklistDetail/faces/adf.task-flow,/workflow/sdpmessagingsca-ui-worklist,/soa-infra,/rss/rssservlet,/owc_discussions,/login!withRedirect.jspa,/owc_discussions/login!default.jspa,/owc_discussions/login.jspa,/owc_discussions,/admin,/rest/api/resourceIndex,/rest/api/spaces,/rest/api/discussions,/rest/api/tags,/rest/api/taggeditems,/rest/api/activities,/rest/api/activitygraph,/rest/api/feedback,/rest/api/people,/rest/api/messageBoards,/rest/api/searchresults,/activitygraph-engines,/wcps/api,/pageletadmin,/authenticateWithApplicationServer,/em,/console,/DefaultToDoTaskFlow,/b2b,/sdpmessaging/userprefs-ui,/adfAuthentication"

  $PUBLIC_URI_LIST="/webcenter,/owc_
  discussions,/rss,/workflow,/rest/api/cmis,/cs,/"

> **Note:** If SOA is installed later or other additional URLs need to be protected, the OAM configuration tool should be executed again using the same `app_domain` and including *all* the URLs that would be protected (not just the new ones).

If your command ran successfully, you should see the following output:

```
Processed input parameters
Initialized Global Configuration
Successfully completed the Create operation
Operation Summary:
Policy Domain: WebCenter_EDG
Host Identifier: WebCenter_EDG
Access Gate ID: WebCenter_EDG_AG
```

10.2.3.3 Updating the REST Policies

To update the REST policies:

1. Locate the policy domain that you created and verified in the previous steps and open the **Policies** tab.

   You should see two policies already created - **Protected_JSessionId_Policy** and **Default Public Policy**.

2. Create another policy called **WebCenterRESTPolicy**, using the values shown below:

   Description: `This policy protects REST protected URIs using BASIC authentication scheme required for functioning with the WebCenter Outlook plug-in or iPhone integration.`

   Resource Type: `http`

   Operation(s): `GET, POST`

   Resource: Select all resources starting with `/rest` except for `/rest/cmis/repository`.

   ```
   /rest/api/resourceIndex
   /rest/api/spaces
   /rest/api/discussions
   /rest/api/tags
   /rest/api/taggeditems
   /rest/api/activities
   /rest/api/activitygraph
   /rest/api/feedback
   /rest/api/people
   /rest/api/messageBoards
   /rest/api/searchresults
   ```

   Host Identifier: Same as the one used for the resources.

3. Click **Save**.

4. In the newly created policy, navigate to **Authentication Rule** and add a new rule using the authentication scheme `OraDefaultBasicAuthNScheme`.

5. Open the **Policies** tab and make sure that the polices are in the order shown below:

   `Protected_JSessionId_Policy`

   `WebCenterRESTPolicy`

   `Default Public Policy`

10.2.3.4 Verifying Successful Creation of the Policy Domain and AccessGate

Verifying the Policy Domain

To verify the policy domain, complete these steps:

1. Log on to the Oracle Access Manager:

   `http://OAMADMINHOST:<port>/access/oblix/`

2. Click **Policy Manager**.

3. Click the **My Policy Domains** link on the left panel, you will see a list of all policy domains, among which the domain you just created will be listed. It will have the suffix _PD (for example, `WebCenter_EDG_PD`). In the third column (URL prefixes, you will also see the URIs you specified during the creation of this domain).

4. Click the link to the policy domain you just created. you will land in the General area of this domain.
5. Click the **Resources** tab, you will see the URIs you specified. You can also click other tabs to view other settings.

Verifying the AccessGate Configuration

To verify the AccessGate configuration, complete these steps:

1. Click the **Access System Console** link on the top right hand side (this acts like a toggle; after you click it, it becomes the **Policy Manager** link).
2. Click the **Access System Configuration** tab.
3. Click the **AccessGate Configuration** link on the left panel.
4. Enter 'WebCenter_EDG' as the search criterion (or any other substring you may have used as the `app_domain` name in Section 10.2.3.2, "Running the OAM Configuration Tool"), and click **Go**.
5. Once the AccessGate for the domain you just created shows up (this will have the suffix _AG (for example, **WebCenter_EDG_AG**), click it, and the details of the AccessGate you just created appear.

10.2.3.5 Updating the Host Identifier

The OAM Configuration Tool uses the value of the `app_domain` parameter to create a host identifier for the policy domain. This host identifier must be updated with all the host name variations for the host so that the configuration works correctly. Follow the steps below to update the host identifier created by the OAM Configuration Tool:

1. Navigate to the Access System Console by specifying the following URL in your web browser:

   `http://`*`hostname`*`:`*`port`*`/access/oblix`

   where *`hostname`* refers to the host where WebPass Oracle HTTP Server instance is running and *`port`* refers to the HTTP port of the Oracle HTTP Server instance.
2. When prompted for a username and password, log in as an administrator. Click **OK**.
3. On the Access System main page, click the **Access System Console** link.
4. On the Access System Console page, click the Access System Configuration tab.
5. On the Access System Configuration page, click **Host Identifiers** at the bottom left.
6. On the List all host identifiers page, click on the host identifier created by the OAM Configuration Tool. For example, select `WebCenter_EDG`.
7. On the Host Identifier Details page, click **Modify**.
8. Add the **Preferred HTTP Host** value used in the Access System Configuration. The following is a list of all the possible host name variations using SSO/WebGate:
   - webhost1.mydomain.com:7777
   - webhost2.mydomain.com:7777
   - wchost1:9000

- wchost2:9000
- wchost1:9001
- wchost2:9001
- wchost1:9002
- wchost2:9002
- wchost1:9003
- wchost2:9003
-
- admin.mycompany.com
- adminvhn.mycompany.com:7001
- soahost1vhn1:8001
- soahost2vhn1:8001
- soahost1vhn1:8010
- soahost2vhn1:8010
- adminvhn:7001

9. Select the check box next to Update Cache and then click **Save**.

   A message box with the following message is displayed: "Updating the cache at this point will flush all the caches in the system. Are you sure?".

   Click **OK** to finish saving the configuration changes.

10. Verify the changes on the Host Identifier Details page.

10.2.3.6 Updating the WebGate Profile

The OAM Configuration Tool populates the `Preferred_HTTP_Host` and hostname attributes for the WebGate profile that is created with the value of the `app_domain` parameter. Both these attributes must be updated with the proper values for the configuration to work correctly. Follow the steps below to update the WebGate profile created by the OAM CFG Tool.

1. Navigate to the Access System Console by specifying the following URL in your web browser:

   `http://`*`hostname`*`:`*`port`*`/access/oblix`

   where *`hostname`* refers to the host where WebPass Oracle HTTP Server instance is running and *`port`* refers to the HTTP port of the Oracle HTTP Server instance.

2. On the Access System main page, click the **Access System Console** link, then log in as an administrator.

3. On the Access System Console main page, click the **Access System Configuration** link to display the AccessGates Search page.

4. Enter the proper search criteria and click **Go** to display a list of AccessGates.

5. Select the AccessGate created by the OAM Configuration Tool. For example: WebCenter_EDG_AG).

6. On the AccessGate Details page, select **Modify** to display the Modify AccessGate page.

7. On the Modify AccessGate page, update:
   - **Hostname**: Update the hostname with the name of the computer where WebGate is running, for example: `webhost1.mycompany.com`.
   - **Preferred HTTP Host**: Update the Preferred_HTTP_Host with one of the hostname variations specified in the previous section, for example: `admin.mycompany.com:80`.
   - **Primary HTTP Cookie Domain**: Update the Primary HTTP Cookie Domain with the Domain suffix of the host identifier, for example: mycompany.com
8. Click **Save**. A message box with the "Are you sure you want to commit these changes?" message is displayed.
9. Click **OK** to finish updating the configuration.
10. Verify the values displayed on the Details for AccessGate page to confirm that the updates were successful.

10.2.3.7 Adding Additional Access Servers

To assign an Access Server to the WebGate:

1. Log in as the Administrator on the Access System Console.
2. Navigate to the **Details** for AccessGate page, if necessary. From the Access System Console, select **Access System Configuration**, then **AccessGate Configuration**, then the link for the WebGate (**WebCenter_EDG_AG**).
3. On the **Details** for AccessGate page, click **List Access Servers**.
4. A page appears showing the primary or secondary Access Servers currently configured for this WebGate.

   Click Add.
5. On the Add a New Access Server page, select an Access Server from the **Select Server** list, specify **Primary Server**, and define two connections for the WebGate.

   Click the **Add** button to complete the association.
6. A page appears, showing the association of the Access Server with the WebGate. Click the link to display a summary and print this page for later use.
7. Repeat steps 3 through 6 to associate more Access Servers to the WebGate.

10.2.3.8 Configure Delegated Form Authentication

To configure the form authentication to redirect to the WebGate that was installed with the OAM installation, complete these steps:

1. Open the Access System Console.
2. In the Access System Configuration screen, select **Authentication Management** from the left-hand bar.
3. Select **OraDefaultFormAuthNScheme**.
4. Click **Modify**.
5. In the Challenge Redirect field, enter the host and port of the Oracle HTTP Server for the IDM installation; for example: `http://sso.mycompany.com:7777`.

A WebGate should already be installed in the IDM installation. Refer to section 18.2, "Installing and Configuring WebGate" in the *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management* for details.

10.2.4 Installing and Configuring WebGate

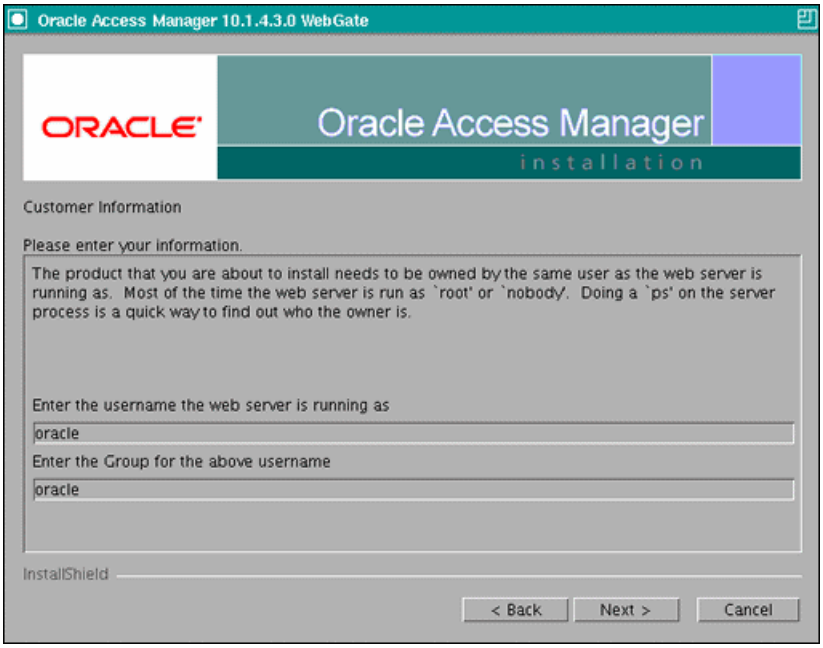
WebGate needs to be installed on each of the WEBHOST*n* machines in order to secure the web tier:

1. Launch the WebGate installer (see Section 1.5.5, "What to Install" for information on where to obtain it) using the following command:

   ```
   ./Oracle_Access_Manager10_1_4_3_0_linux_OHS11g_WebGate -gui
   ```

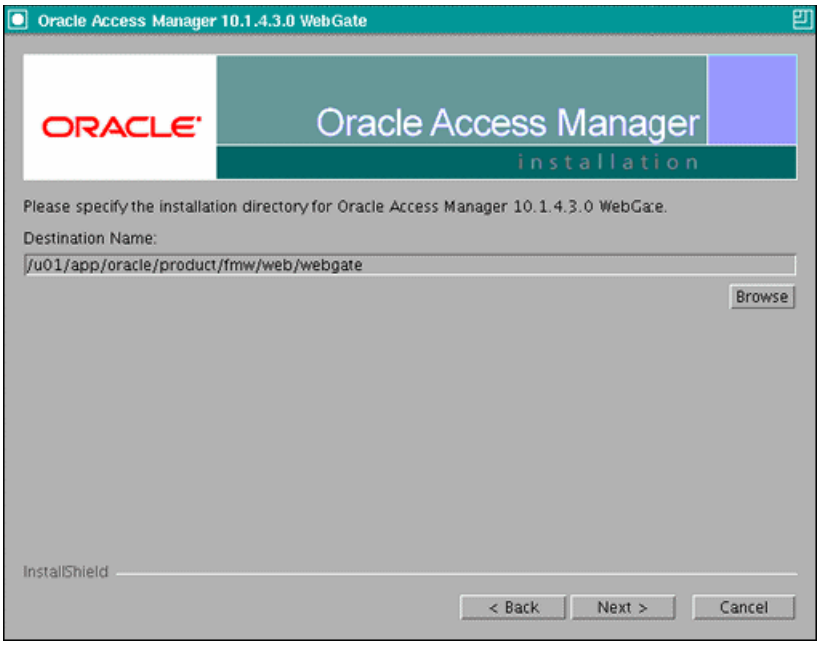
2. The Welcome screen is displayed. Click **Next**.
3. In the Customer Information screen (Figure 10–1), enter the user name and user group that the web server is running as. Click **Next** to continue.

Figure 10–1 Customer Information Screen



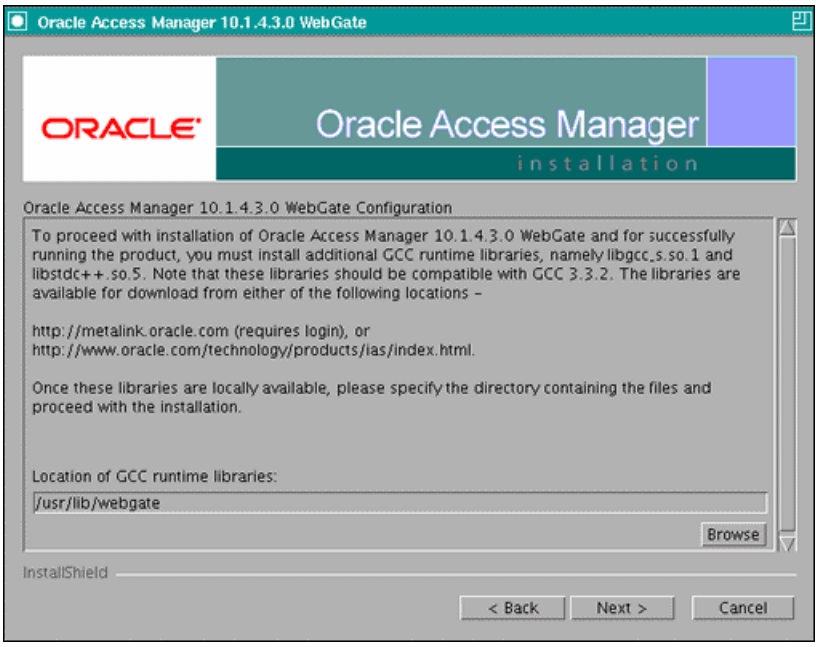
4. In the installation target screen (Figure 10–2), specify the directory where WebGate should be installed. Click **Next** to continue.

Figure 10–2 Installation Target Screen



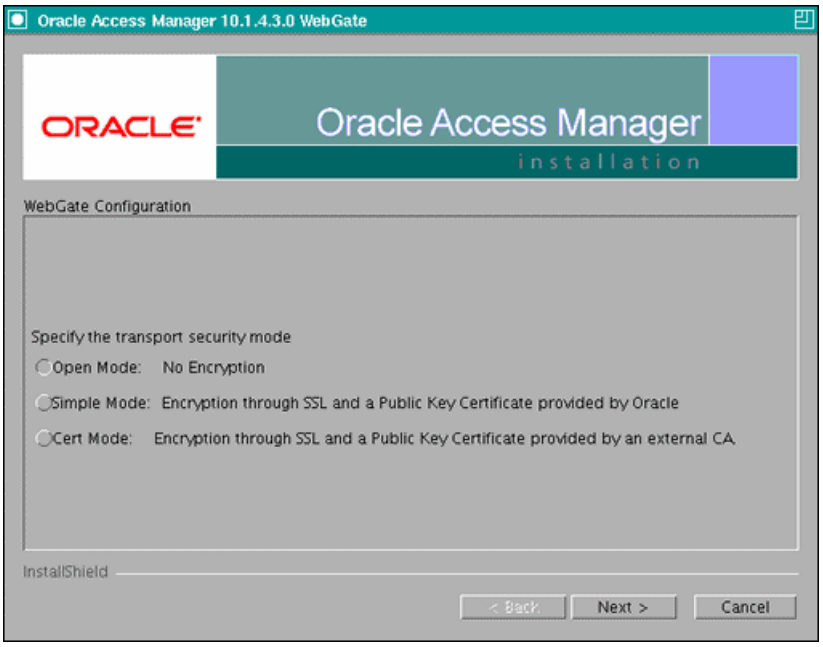
5. In the installation summary screen, click **Next**.
6. Download the required GCC runtime libraries for WebGate as instructed in the WebGate configuration screen (Figure 10–3), and use **Browse** to point to their location on the local computer. Click **Next** to continue.

Figure 10–3 Runtime Libraries Screen



7. The installer now creates the required artifacts. After that is completed, click **Next** to continue.
8. In the transport security mode screen (Figure 10–4), select "Open Mode: No Encryption" and click **Next** to continue.

Figure 10–4 Transport Security Mode Screen



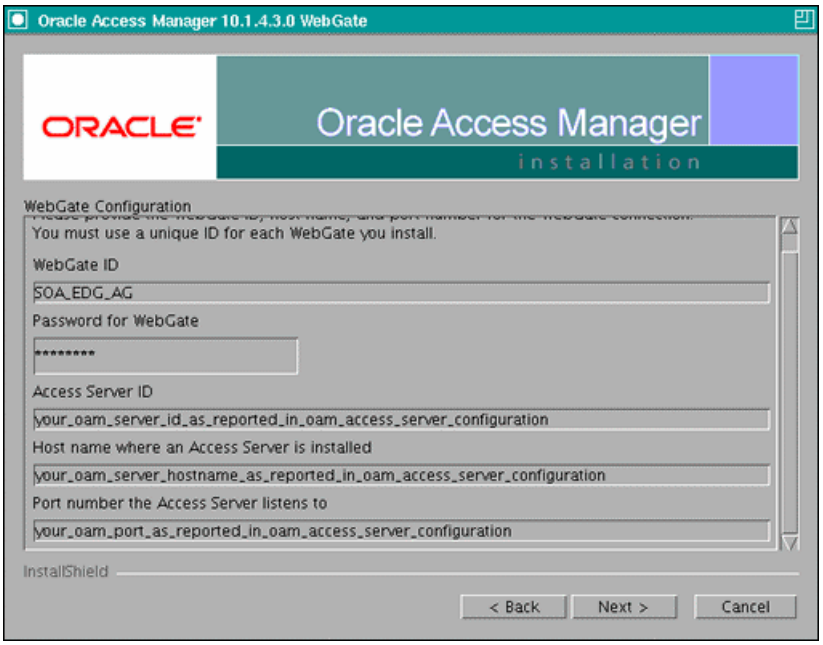
9. In the WebGate configuration screen, provide the details of the Access Server that will be used. You must provide the following information:

   - **WebGate ID**, as provided when the OAM configuration tool was executed
   - **Password for WebGate**
   - **Access Server ID**, as reported by the OAM Access Server configuration
   - **Access Server host name**, as reported by the OAM Access Server configuration
   - **Access Server port number**, as reported by the OAM Access Server configuration

   Note: The Access Server ID, host name, and port are all required.

   You can obtain these details from your Oracle Access Manager administrator. Click **Next** to continue.

Figure 10–5 Access Server Configuration Screen



10. In the Configure Web Server screen, click **Yes** to automatically update the web server. Click **Next** to continue.
11. In the next Configure Web Server screen, specify the full path of the directory containing the `httpd.conf` file. This file is located in the following directory:

    ```
    ORACLE_BASE/admin/<OHS_Instance>/config/OHS/<OHS_ComponentName>
    ```

    For example:

    ```
    /u01/app/oracle/admin/ohs_instance2/config/OHS/ohs2/httpd.conf
    ```

    Click **Next** to continue.
12. In the next Configure Web Server page, a message informs you that the Web server configuration has been modified for WebGate. Click **Yes** to confirm.
13. Stop and start your Web server for the configuration updates to take effect. Click **Next** to continue.
14. In the next Configure Web Server screen, the following message is displayed: "If the web server is set up in SSL mode, then the httpd.conf file needs to be configured with the SSL related parameters. To manually tune your SSL configuration, please follow the instructions that come up". Click **Next** to continue.
15. In the next Configure Web Server screen, a message with the location of the document that has information on the rest of the product setup and Web server configuration is displayed. Choose **No** and click **Next** to continue.
16. The final Configure Web Server screen appears with a message to manually launch a browser and open the HTML document for further information on configuring your Web server. Click **Next** to continue.
17. The Oracle COREid Readme screen appears. Review the information on the screen and click **Next** to continue.
18. A message appears (along with the details of the installation) informing you that the installation was successful.

10.2.5 Configuring IP Validation for the Webgate

IP Validation determines if a client's IP address is the same as the IP address stored in the `ObSSOCookie` generated for single sign-on. IP Validation can cause issues in systems using load balancer devices configured to perform IP termination, or when the authenticating webgate is front-ended by a different load balancer from the one front-ending the enterprise deployment. To configure your load balancer so that it is not validated in these cases, follow these steps:

1. Navigate to the Access System Console using the following URL:

   `http://hostname:port/access/oblix`

   Where the *hostname* refers to the host where the WebPass Oracle HTTP Server instance is running, and *port* refers to the HTTP port of the Oracle HTTP Server instance.

2. On the Access System main page, click the **Access System Console** link, and then log in as an administrator.
3. On the Access System Console main page, click **Access System Configuration**, and then click the **Access Gate Configuration** link on the left pane to display the AccessGates Search page.
4. Enter the proper search criteria and click **Go** to display a list of AccessGates.
5. Select the AccessGate created by the Oracle Access Manager configuration tool.
6. Click **Modify** at the bottom of the page.
7. In the **IPValidationException** field, enter the address of the load balancer used to front-end the deployment.
8. Click **Save** at the bottom of the page.

10.2.6 Setting Up the WebLogic Authenticators

This section assumes that you have already set up the LDAP authenticator by following the steps in Section 10.1.2.1, "Creating the LDAP Authenticator." If you have not already created the LDAP authenticator, do it before continuing with this section.

This section includes the following topics:

- Section 10.2.6.1, "Back Up Configuration Files"
- Section 10.2.6.2, "Setting Up the OAM ID Asserter"
- Section 10.2.6.3, "Setting the Order of Providers"

10.2.6.1 Back Up Configuration Files

To be safe, first back up the relevant configuration files:

```
ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/config/config.xml
ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/config/fmwconfig/jps-con
fig.xml
ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/config/fwmconfig/system-
jazn-data.xml
```

Also back up the `boot.properties` file for the Administration Server.

10.2.6.2 Setting Up the OAM ID Asserter

To set up the OAM ID Asserter, complete these steps:

1. Log into Weblogic Console, if not already logged in.
2. Navigate to `SecurityRealms\<Default Realm Name>\Providers`.
3. Click **New** and Select "OAM Identity Asserter" from the dropdown menu.
4. Name the asserter (for example, "OAM ID Asserter") and click **Save**.
5. Click the newly added asserter to see the configuration screen for OAM Identity Asserter.
6. Set the control flag to 'REQUIRED' and click **Save**.
7. Check that **OAM_REMOTE_USER** and **ObSSOCookie** is set for **Active Types**.
8. Save the settings.

10.2.6.3 Setting the Order of Providers

Reorder the OAM Identity Asserter, OID Authenticator, and Default Authenticator by ensuring that the control flag for each authenticator is set as follows:

- OAM Identity Asserter: REQUIRED
- OID LDAP Authenticator (or OVD LDAP Authenticator): SUFFICIENT
- Default Authenticator: SUFFICIENT

10.2.7 Understanding Virtual Host configuration

The WebCenter Suite includes applications that use "/" as the context root. To route these applications through Oracle HTTP Server without virtual hosts you can add the following entry to `mod_wl_ohs.conf` file:

```
<Location  />
      SetHandler weblogic-handler
      WebLogicHost webcenter.example.com
      WebLogicPort 8889
</Location>
```

However, this would affect all context roots not explicitly defined.

The term virtual host refers to the practice of running more than one Web site (such as www.company1.com and www.company2.com) on a single machine. Virtual hosts can be IP-based, where you have a different IP address for each Web site, or name-based, where you have multiple names running on each IP address.

You must configure virtual hosts both on the HTTP Server and on the load balancer. On the load balancer, configure an externally-facing URL, such as wcedg-pagelet.mycompany.com. This configuration routes to the virtual host configured on the HTTP Servers. For example:

- wcedg.mycompany.com -> webhostn:7777
- wcedg-pagelet.mycompany.com -> webhostn-pagelet:7777

The steps for configuring the virtual host on the HTTP Server are outlined in Section 10.2.8, "Configuring Virtual Hosts for OAM 10g."

10.2.8 Configuring Virtual Hosts for OAM 10g

To configure OAM 10g for virtual hosts, bypass single sign-on and the authentication end points for RSS and the SES crawler, as their use by external RSS readers and SES only support BASIC authorization. In addition, these integrations do not require single

sign-on. For more information, see "Associating a WebGate with Particular Virtual Hosts, Directories, or Files" in the *Oracle Access Manager Access Administration Guide* for 10g.

Locate and comment out the following configuration in `httpd.conf` file:

```
#Comment out this and move to VirtualHost configuration
#<LocationMatch "/*">
#AuthType Oblix
#require valid-user
#</LocationMatch>
```

This entry causes the WebGate to intercept all requests and process them. Move this entry into the virtual host configuration where single sign-on is required, as shown below:

```
NameVirtualHost *:7777

<VirtualHost *:7777>
ServerName webhost1.example.com
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName https://wc.mycompany.com:443
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName admin.mycompany.com:80
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName wcinternal.mycompany.com:80
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName webhost1-pagelet.example.com
<Location  />
SetHandler weblogic-handler
WLExcludePathOrMimeType /oamsso
WebLogicCluster wchost1:9001,wchost2:9001
AuthType Oblix
require valid-user
</Location>
</VirtualHost>
```

Restart Oracle HTTP Server.

Also be sure to update the DNS with entries for webhost1-pagelet.example.com.

10.3 Oracle Access Manager 11g Integration

This section describes how to set up Oracle Access Manager 11g as the single sign-on solution for the Oracle WebCenter Enterprise Deployment topology.

This section contains the following sections:

10.3.1 Overview of Oracle Access Manager Integration

Oracle Access Manager (OAM) is the recommended single sign-on solution for Oracle Fusion Middleware 11*g* Release 1. For more information on installing and configuring an OAM installation, see *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*. This chapter explains the procedure for configuring the WebCenter installation with an existing OAM installation and the underlying directory service. Oracle recommends using either Oracle Internet Directory (OID), Oracle Virtual Directory (OVD), or both of these directory services.

Note: The WebCenter topology described in this guide uses a Single Sign-On configuration where both the WebCenter System and the Single Sign-On System are in the same network domain (mycompany.com). For a multi-domain configuration, please refer to the required configuration steps in "Chapter 7, Configuring Single Sign-On," of the *Oracle Access Manager Access Administration Guide*.

10.3.2 Prerequisites for Oracle Access Manager

The setup for Oracle Access Manager (OAM) assumes an existing OAM installation complete with Access Managers and a policy protecting the Policy Manager. For more information on installing and configuring an OAM installation, see *Oracle Fusion Middleware Enterprise Deployment Guide for Oracle Identity Management*.

10.3.3 Install WebGate

You must install a WebGate on each of the WEBHOST machines where an HTTP Server has already been installed. Section 10.3.3 and Section 10.3.4 should be repeated for each WEBHOST in the deployment environment.

10.3.3.1 Installing GCC Libraries

Before using the WebGate installer, the libgcc_s and libstdc++ libraries must exist in a common directory. This directory is specified during the installation process. Create a directory on your disk and copy the libraries according to Table 10–1.

Table 10–1 Versions of GCC Third-Party Libraries for Linux and Solaris

Operating System	Architecture	GCC Libraries	Required Library Version
Linux 32-bit	x86	libgcc_s.so.1 libstdc++.so.5	3.3.2
Linux 64-bit	x64	libgcc_s.so.1 libstdc++.so.6	3.4.6
Solaris 64-bit	SPARC	libgcc_s.so.1 libstdc++.so.5	3.3.2

These libraries should reside on the disk, if they do not reside on the dick, see the administration guide for your operating system distribution for the location of these libraries.

10.3.3.2 Installing WebGate

This section describes the procedures for installing WebGate.

Launching the Installer

The Installer program for Oracle HTTP Server 11g Webgate for Oracle Access Manager is included in the webgate.zip file.

To start the installation wizard:

1. Extract the contents of the webgate.zip file to a directory. By default, this directory is named `webgate`.
2. Move to the Disk1 directory under the webgate folder.
3. Start the installer using the following command:

```
$ ./runInstaller -jreLoc <WebTier_Home>/jdk
```

> **Note:** When you install Oracle HTTP Server, the jdk directory is created under the *WebTier_Home* directory. You must enter the absolute path of the JRE folder located in this JDK when launching the installer.

After the installer starts, the Welcome screen appears.

Installation Flow and Procedure

If you need additional help with any of the installation screens, click **Help** to access the online help.

To install Oracle HTTP Server 11g Webgate for Oracle Access Manager:

1. In the Welcome screen, click **Next**.
2. In the Prerequisite Checks screen, click **Next**.

3. In the Specify Installation Location screen, specify the Middleware Home and Oracle Home locations.

   Note: The Middleware Home contains an Oracle Home for Oracle Web Tier.

   Click **Next**.

4. In the Specify GCC Library screen, specify the directory that contains the GCC libraries, and click **Next**.

5. In the Installation Summary screen, verify the information on this screen and click **Install** to begin the installation.

6. In the Installation Progress screen, you may be prompted to run the *ORACLE_HOME*/oracleRoot.sh script to set up the proper file and directory permissions.

   Click **Next** to continue.

7. In the Installation Complete screen, click **Finish** to exit the installer.

10.3.3.3 Post-Installation Steps

Complete the following procedure after installing Oracle HTTP Server 11g Webgate for Oracle Access Manager:

1. Move to the following directory under your Oracle Home for Webgate:

   ```
   $ cd Webgate_Home/webgate/ohs/tools/deployWebGate
   ```

2. On the command line, run the following command to copy the required bits of agent from the Webgate_Home directory to the Webgate Instance location:

   ```
   $ ./deployWebgateInstance.sh -w Webgate_Instance_Directory -oh Webgate_Oracle_Home
   ```

   Where *Webgate_Oracle_Home* is the directory where you have installed Oracle HTTP Server Webgate and created as the Oracle Home for Webgate, as in the following example:

   ```
   MW_HOME/Oracle_OAMWebGate1
   ```

   The *Webgate_Instance_Directory* is the location of Webgate Instance Home, which is same as the Instance Home of Oracle HTTP Server, as in the following example:

   ```
   MW_HOME/Oracle_WT1/instances/instance1/config/OHS/ohs1
   ```

   Note: an Instance Home for Oracle HTTP Server is created after you configure Oracle HTTP Server.

3. Run the following command to ensure that the LD_LIBRARY_PATH variable contains *Oracle_Home_for_Oracle_HTTP_Server*/lib:

   ```
   $ export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:Oracle_Home_for_Oracle_HTTP_Server/lib
   ```

4. From your present working directory, move up one directory level:

   ```
   $ cd Webgate_Home/webgate/ohs/tools/setup/InstallTools
   ```

5. On the command line, run the following command to copy the apache_webgate.template from the *Webgate_Home* directory to the Webgate Instance location (renamed to webgate.conf) and update the httpd.conf file to add one line to include the name of webgate.conf:

```
$ ./EditHttpConf -w Webgate_Instance_Directory [-oh Webgate_Oracle_Home] [-o
output_file]
```

> **Note:** The -oh *WebGate_Oracle_Home* and -o *output_file* parameters are optional.

Where *WebGate_Oracle_Home* is the directory where you have installed Oracle HTTP Server Webgate for Oracle Access Manager and created as the Oracle Home for Webgate, as in the following example:

```
MW_HOME/Oracle_OAMWebGate1
```

The *Webgate_Instance_Directory* is the location of Webgate Instance Home, which is same as the Instance Home of Oracle HTTP Server, as in the following example:

```
MW_HOME/Oracle_WT1/instances/instance1/config/OHS/ohs1
```

The *output_file* is the name of the temporary output file used by the tool, as in the following example:

```
Edithttpconf.log
```

10.3.4 Register the WebGate Agent

This section describes the procedures for registering the WebGate Agent.

10.3.4.1 The RREG Tool

The RREG tool is part of the OAM 11g installation. If it is not already available, extract it using the following procedure:

1. After installing and configuring Oracle Access Manager, navigate to the following location:

```
IDM_Home/oam/server/rreg/client
```

2. On the command line, untar the RREG.tar.gz file using gunzip, as in the following example:

```
gunzip RREG.tar.gz

tar -xvf RREG.tar
```

The tool used to register the agent is located in the following location:

```
RREG_Home/bin/oamreg.sh
```

RREG_Home is the directory to which you extracted the contents of RREG.tar.gz/rreg.

10.3.4.2 Updating the OAM11gRequest file

In the *RREG_Home*/input directory there are template files named `OAM11gRequest.xml`. This file should be copied and edited in order to create the policies for the WebCenter installation. After editing, the file should look as follows:

> **Note:** Replace $$webtierhost$$, $$oamadminserverport$$, and $$oamhost$$ with the hostnames in your installation.

```
<?xml version="1.0" encoding="UTF-8"?>

<!-- Copyright (c) 2009, 2010, Oracle and/or its affiliates. All rights reserved.

   NAME: OAM11GRequest_short.xml - Template for OAM 11G Agent Registration request
file
 (Shorter version - Only mandatory values - Default values will be used for all
other fields)
   DESCRIPTION: Modify with specific values and pass file as input to the tool.

-->
<OAM11GRegRequest>
    <serverAddress>http://$$oamhost$$:$$oamadminserverport$$</serverAddress>
    <hostIdentifier>$$webtierhost$$_webcenter</hostIdentifier>
    <agentName>$$webtierhost$$_webcenter</agentName>
    <applicationDomain>$$webtierhost$$_webcenter</applicationDomain>
    <logOutUrls>
        <url></url>
    </logOutUrls>
    <protectedResourcesList>
        <resource>/em</resource>
        <resource>/console</resource>
        <resource>/webcenter/adfAuthentication</resource>
        <resource>/webcenter/content</resource>
        <resource>/webcenter/content/.../*</resource>
        <resource>/integration/worklistapp</resource>
        <resource>/integration/worklistapp/.../*</resource>

<resource>/workflow/sdpmessagingsca-ui-worklist/faces/adf.task-flow</resource>
        <resource>/workflow/WebCenterWorklistDetail/faces/adf.task-flow</resource>
        <resource>/workflow/sdpmessagingsca-ui-worklist</resource>
        <resource>/workflow/sdpmessagingsca-ui-worklist/.../*</resource>
        <resource>/sdpmessaging/userprefs-ui</resource>
        <resource>/sdpmessaging/userprefs-ui/.../*</resource>
        <resource>/rss/rssservlet</resource>
        <resource>/owc_discussions/login!withRedirect.jspa</resource>
        <resource>/owc_discussions/login!default.jspa</resource>
        <resource>/owc_discussions/login.jspa</resource>
        <resource>/owc_discussions/admin</resource>
        <resource>/owc_discussions/admin/.../*</resource>
        <resource>/rest/api/resourceIndex</resource>
        <resource>/rest/api/spaces</resource>
        <resource>/rest/api/spaces/.../*</resource>
        <resource>/rest/api/discussions</resource>
        <resource>/rest/api/discussions/.../*</resource>
        <resource>/rest/api/tags</resource>
        <resource>/rest/api/tags/.../*</resource>
        <resource>/rest/api/taggeditems</resource>
        <resource>/rest/api/taggeditems/.../*</resource>
        <resource>/rest/api/activities</resource>
```

```
    <resource>/rest/api/activities/.../*</resource>
    <resource>/rest/api/activitygraph</resource>
    <resource>/rest/api/activitygraph/.../*</resource>
    <resource>/rest/api/feedback</resource>
    <resource>/rest/api/feedback/.../*</resource>
    <resource>/rest/api/people</resource>
    <resource>/rest/api/people/.../*</resource>
    <resource>/rest/api/messageBoards</resource>
    <resource>/rest/api/messageBoards/.../*</resource>
    <resource>/rest/api/searchresults</resource>
    <resource>/rest/api/searchresults/.../*</resource>
    <resource>/activitygraph-engines</resource>
    <resource>/activitygraph-engines/.../*</resource>
    <resource>/wcps/api</resource>
    <resource>/wcps/api/.../*</resource>
    <resource>/adfAuthentication</resource>
    <resource>/pageletadmin</resource>
    <resource>/pageletadmin/.../*</resource>
    <resource>/authenticateWithApplicationServer</resource>
    <resource>/em</resource>
    <resource>/em/…/*</resource>
    <resource>/console</resource>
    <resource>/console/…/*</resource>
    <resource>/soa/composer</resource>
    <resource>/soa/composer/…/*</resource>
    <resource>/soa-infra</resource>
    <resource>/soa-infra/deployer</resource>
    <resource>/soa-infra/deployer/…/*</resource>
    <resource>/soa-infra/events/edn-db-log</resource>
    <resource>/soa-infra/events/edn-db-log/…/*</resource>
    <resource>/soa-infra/cluster/info</resource>
    <resource>/soa-infra/cluster/info/…/*</resource>
    <resource>/inspection.wsil</resource>
    <resource>/cs/idcplg</resource>
    <resource>/cs/idcplg/…/*</resource>
    <resource>/cs/groups</resource>
    <resource>/cs/groups/…/*</resource>
</protectedResourcesList>
<publicResourcesList>
    <resource>/webcenter</resource>
    <resource>/webcenter/…/*</resource>
    <resource>/owc_discussions</resource>
    <resource>/owc_discussions/…/*</resource>
    <resource>/rss</resource>
    <resource>/rss/…/*</resource>
    <resource>/workflow</resource>
    <resource>/workflow/…/*</resource>
    <resource>/rest/api/cmis/…/*</resource>
    <resource>/cs</resource>
    <resource>/cs/…/*</resource>
    <resource>/soa-infra/services/…/*</resource>
    <resource>/soa-infra/directWSDL</resource>
    <resource>/integration/services</resource>
    <resource>/integration/services/…/*</resource>

</publicResourcesList>
<userDefinedParameters>
    <userDefinedParam>
        <name>ipValidationExceptions</name>
        <value>10.1.1.1</value>
```

```
        </userDefinedParam>
    </userDefinedParameters>
</OAM11GRegRequest>
```

10.3.4.3 Running the oamreg Tool

Run the oamreg tool using the following command:

```
$ ./RREG_Home/bin/oamreg.sh inband input/OAM11GRequest.xml
```

When prompted for the agent credentials, enter your OAM administrator credentials.

The run should look as follows:

```
-----------------------------------------------
Welcome to OAM Remote Registration Tool!
Parameters passed to the registration tool are:
Mode: inband
Filename: /scratch/aime1/install/MW_HOME/Oracle_
IDM1/oam/server/rreg/input/WebCenterOAM11gRequest.xml
Enter your agent username:weblogic
Username: weblogic
Enter agent password:
Do you want to enter a Webgate password?(y/n):
y
Enter webgate password:
Enter webgate password again:
Password accepted. Proceeding to register..
Aug 16, 2010 1:22:30 AM
oracle.security.am.engines.rreg.client.handlers.request.OAM11GRequestHandler
getWebgatePassword
INFO: Passwords matched and accepted.
Do you want to import an URIs file?(y/n):
n
----------------------------------------
Request summary:
OAM11G Agent Name:WEBHOST1_webcenter
URL String:WEBHOST1_webcenter
Registering in Mode:inband
Your registration request is being been sent to the Admin server at:
http://oamserver.mycompany.com:7001
----------------------------------------
Inband registration process completed successfully! Output artifacts are created
in the output folder.
```

10.3.4.4 Copy Access files to WEBHOSTs

The following two files are generated in *RREG_Home*/output/$$webtierhost$$_webcenter:

- ObAccessClient.xml
- cwallet.sso

Copy these files to the Webgate instance (*Webgate_Instance_Home*/config/OHS/ohsN/webgate/config/) location on the WEBHOST machine.

10.3.4.5 Set REST policies

Logon to the OAM Administration Console, and follow these steps:

1. Select **Application Domain**, **$$webtierhost$$_webcenter**, and then **Authentication Policies**, and create a new policy underneath it named **WebCenter REST Auth Policy**. Choose Authentication scheme as **BASICScheme**.
2. Select **Application Domain**, **$$webtierhost$$_webcenter**, and then **Authentication Policies**, and then **Protected Resource Policy**, and remove all entries starting with `/rest`.
3. Go back to **WebCenter REST Auth Policy** created in step 1 and add all entries removed in step 2. See below for reference and click **Apply**.

The REST must follow the BASIC authentication scheme, so that external clients, such as outlook plugins and iphone applications can connect to WebCenter REST protected by SSO.

10.3.5 Setting Up the WebLogic Authenticators

This section assumes that you have already set up the LDAP authenticator by following the steps in Section 10.1.2.1, "Creating the LDAP Authenticator." If you have not already created the LDAP authenticator, do it before continuing with this section.

This section includes the following topics:

- Section 10.3.5.1, "Back Up Configuration Files"
- Section 10.3.5.2, "Setting Up the OAM ID Asserter"
- Section 10.3.5.3, "Setting the Order of Providers"

10.3.5.1 Back Up Configuration Files

To be safe, first back up the relevant configuration files:

```
ORACLE_BASE/admin/domain_name/aserver/domain_name/config/config.xml
ORACLE_BASE/admin/domain_name/aserver/domain_name/config/fmwconfig/jps-con
fig.xml
ORACLE_BASE/admin/domain_name/aserver/domain_name/config/fwmconfig/system-
jazn-data.xml
```

In addition, back up the `boot.properties` file for the Administration Server.

10.3.5.2 Setting Up the OAM ID Asserter

To set up the OAM ID Asserter:

1. Log into Weblogic Console, if not already logged in.
2. Navigate to `SecurityRealms\<Default Realm Name>\Providers`.
3. Click **New** and Select **OAM Identity Asserter** from the dropdown menu.
4. Name the asserter (for example, **OAM ID Asserter**) and click **Save**.
5. Click the newly added asserter to see the configuration screen for OAM Identity Asserter.
6. Set the control flag to **'REQUIRED'** .
7. Select both the **ObSSOCookie** and **OAM_REMOTE_USER** options under active types.
8. Save the settings.

Finally, log in as admin to WLST console and run the following command:

```
addOAMSSOProvider(loginuri="/${app.context}/adfAuthentication",
```

```
logouturi="/oamsso/logout.html")
```

10.3.5.3 Setting the Order of Providers

Reorder the OAM Identity Asserter, OID Authenticator, and Default Authenticator by ensuring that the control flag for each authenticator is set as follows:

- OAM Identity Asserter: REQUIRED
- OID LDAP Authenticator (or OVD LDAP Authenticator): SUFFICIENT
- Default Authenticator: SUFFICIENT

10.3.6 Understanding Virtual Host configuration

The WebCenter Suite includes applications that use "/" as the context root. To route these applications through Oracle HTTP Server without virtual hosts you can add the following entry to `mod_wl_ohs.conf` file:

```
<Location  />
      SetHandler weblogic-handler
      WebLogicHost webcenter.example.com
      WebLogicPort 8889
</Location>
```

However, this would affect all context roots not explicitly defined.

The term virtual host refers to the practice of running more than one Web site (such as www.company1.com and www.company2.com) on a single machine. Virtual hosts can be IP-based, where you have a different IP address for each Web site, or name-based, where you have multiple names running on each IP address.

You must configure virtual hosts both on the HTTP Server and on the load balancer. On the load balancer, configure an externally-facing URL, such as wcedg-pagelet.mycompany.com. This configuration routes to the virtual host configured on the HTTP Servers. For example:

- wcedg.mycompany.com -> webhostn:7777
- wcedg-pagelet.mycompany.com -> webhostn-pagelet:7777

The steps for configuring the virtual host on the HTTP Server are outlined in Section 10.3.7, "Configuring Virtual Hosts for OAM11g."

10.3.7 Configuring Virtual Hosts for OAM11g

To configure OAM 11g for virtual hosts, bypass single sign-on and the authentication end points for RSS and the SES crawler, as their use by external RSS readers and SES only support BASIC authorization. In addition, these integrations do not require single sign-on.

To configure virtual hosts for OAM 11g:

1. Locate and comment out the following configuration in webgate.conf:

```
#Comment out this and move to VirtualHost configuration
      #<LocationMatch "/*">
      #AuthType Oblix
      #require valid-user
      #</LocationMatch>
```

   This entry causes the WebGate to intercept all requests and process them.

2. Move this entry into the virtual host configuration where single sign-on is required. as shown in the example below:

```
NameVirtualHost *:7777

<VirtualHost *:7777>
        ServerName webhost1.example.com
<LocationMatch "/*">
          AuthType Oblix
          require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName https://wc.mycompany.com:443
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName admin.mycompany.com:80
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
ServerName wcinternal.mycompany.com:80
<LocationMatch "/*">
AuthType Oblix
require valid-user
</LocationMatch>
</VirtualHost>

<VirtualHost *:7777>
        ServerName webhost1-pagelet.example.com
<Location  />
            SetHandler weblogic-handler
            WLExcludePathOrMimeType /oamsso
            WebLogicCluster wchost1:9001,wchost2:9001
            AuthType Oblix
            require valid-user
</Location>
</VirtualHost>
```

3. Restart Oracle HTTP Server. Also be sure to update the DNS with entries for webhost1-pagelet.example.com

10.4 Configuring WebCenter Applications

This section covers the following topics:

- Section 10.4.1, "Configuring System Properties"
- Section 10.4.2, "Configuring the WebCenter Administrator Role"
- Section 10.4.3, "Setting Up Discussions Server to Use OAM as SSO Provider"

10.4.1 Configuring System Properties

There is a system property that tells WebCenter and ADF that the application is configured in SSO mode and some special handling is required. The following system property is required in this mode:

Table 10–2 System Property

Property	Value	Comment
oracle.webcenter.spaces.osso	true	This flag tells WebCenter that SSO is being used, so no login form should be displayed on the default landing page. Instead, it will render a login link that the user can click to invoke the SSO authentication.

To set this property for WCHOST1 and WCHOST2, edit the `setDomainEnv.sh` script which is located in your *<managedserver_domain_home>/bin* directory. Add the property to the `EXTRA_JAVA_PROPERTIES` variable, as follows:

```
EXTRA_JAVA_PROPERTIES="-Dweblogic.security.SSL.ignoreHostnameVerification=true
 -Doracle.mds.bypassCustRestrict=true -Djps.update.subject.dynamic=true
-Doracle.webcenter.spaces.osso=true -noverify ${EXTRA_JAVA_PROPERTIES}"
```

10.4.2 Configuring the WebCenter Administrator Role

After Oracle Internet Directory or Oracle Virtual Directory is configured as primary authenticator in WebCenter, the "weblogic" user should not be used as the WebCenter administrator. Create a user in Oracle Internet Directory and make that user the WebCenter administrator, either using WLST or Enterprise Manager:

- Section 10.4.2.1, "Granting the WebCenter Spaces Administrator Role Using WLST"
- Section 10.4.2.2, "Granting the WebCenter Spaces Administrator Role Using Enterprise Manager"

10.4.2.1 Granting the WebCenter Spaces Administrator Role Using WLST

To grant the WebCenter Administrator role using WLST:

1. Start WLST.
2. Connect to the WebCenter Spaces Administration Server for the target domain with the following command:

   ```
   connect('<user_name>','<password>, '<host_id:port>')
   ```

   Where:

   - *<user_name>* is the name of the user account with which to access the Administration Server (for example, `weblogic`)
   - *<password>* is the password with which to access the Administration Server
   - *<host_id>* is the host ID of the Administration Server
   - *<port>* is the port number of the Administration Server (for example, `7001`).
3. Create a user in the LDAP Store named **WCAdmin**.

   This user will be assigned the role.

4. Grant the WebCenter Spaces administrator application role to the user in LDAP using the `grantAppRole` command as shown below:

```
grantAppRole(appStripe="webcenter", appRoleName="s8bba98ff_4cbb_40b8_beee_
296c916a23ed#-#Administrator",
principalClass="weblogic.security.principal.WLSUserImpl",
principalName="WCAdmin")
```

   where *<WCAdmin>* is the name of the administrator account.

   Note: Before `grantAppRole` is called, `WCAdmin` must exist in LDAP. For user creation details, see Section 10.1.2.2.1, "Provisioning Admin Users and Groups in an LDAP Directory."

5. To test the new account, log in to WebCenter Spaces using the new account name.

   The Administration link should appear, and you should be able to perform all administrator operations.

10.4.2.2 Granting the WebCenter Spaces Administrator Role Using Enterprise Manager

This section describes how to grant the WebCenter Spaces administrator role to a user account other than the default "weblogic" account.

To grant the WebCenter Spaces Administrator role using Enterprise Manager:

1. Log into Fusion Middleware Control and select the WebLogic domain for WebCenter Spaces.
2. From the WebLogic Domain menu, select **Security**, and then **Application Roles**.

   The Application Roles page displays.
3. Search for the Administration application role by selecting the **Application** name for WebCenter Spaces (`WC_Spaces/webcenter`), and providing the following internal identifier used by WebCenter Spaces as the **Role Name**:

```
s8bba98ff_4cbb_40b8_beee_296c916a23ed#-#Administrator
```

   The search should return `s8bba98ff_4cbb_40b8_beee_296c916a23ed#-#Administrator`, which is the administrator role identifier.
4. Click the administrator role name (`s8bba98ff_4cbb_40b8_beee_296c916a23ed#-#Administrator`) in the Role Name column.

   The Edit Application Role page displays.
5. Click **Add User**.

   The Add User pop-up displays.
6. Use the Search function to search for the user to assign the Administrator role to.
7. Use the arrow keys to move the user from the Available Users column to the Selected Users column, and click **OK**.
8. On the Edit Application Role page, click **OK**.
9. Restart the `WC_Spaces` managed server.

   When you log in to WebCenter Spaces, the Administration link should appear and you should be able to perform all administrator operations.

10.4.3 Setting Up Discussions Server to Use OAM as SSO Provider

When associating the domain with a identity store that does not contain the group "Administrators", you must assign some other valid user or group the admin role for the discussions server. You can do this by issuing the following command in the wlst console:

```
cd ORACLE_HOME/common/bin/

./wlst.sh

connect('weblogic', 'weblogic', 'ADMINVHN:7001')

addDiscussionsServerAdmin(appName='owc_discussions', name='weblogic_wc',
type='USER', server='wc_collaboration1')
```

or:

```
addDiscussionsServerAdmin(appName='owc_discussions',
name='discussions-admin-group', type='GROUP', server='wc_collaboration1')
```

Where *weblogic_wc* is an example of the user you want to assign the administrator role for the discussions server.

To configure Oracle WebCenter Discussions Server for OAM single sign-on:

1. Log in to the Oracle WebCenter Discussions Server Admin Console at:

   `http://host:port/owc_discussions/admin`

   Where *host* and *port* are the host ID and port number of the **WC_Collaboration** managed server.

2. Open the System Properties page and edit, (if it already exists), or add the `owc_discussions.sso.mode` property, setting its value to `true`.

3. Edit or add the `jiveURL` property to point to the base URL of the SSO server. For example:

   ```
   jiveURL = example.com:8890/owc_discussions
   ```

10.4.4 Configuring the Worklist Service for SSO

After completing the setup required for OAM SSO, run the following command on the WebCenter Administration server so that the Worklist service changes to take effect:

```
> setBPELConnection('webcenter','WebCenter-Worklist',
'https://wc.mycompany.com',server='wc_spaces1')
```

10.5 Configuring WebCenter and BPEL Authentication

This section covers the following topics:

- Section 10.5.1, "Set Authenticator"
- Section 10.5.2, "Set Role Members for BPMWorkflowAdmin Application Role in soa-infra"
- Section 10.5.3, "Configure SOA Callback URLs"

10.5.1 Set Authenticator

Ensure that the SOA domain is using the same authenticators as the WebCenter domain and has been configured for OAM Authentication.

10.5.2 Set Role Members for BPMWorkflowAdmin Application Role in soa-infra

When associating the domain with a identity store that does not contain the user "weblogic", you must assign some other valid user into the application role BPMWorkflowAdmin. To assign the role to a valid user, the following may be done:

1. Create a user in LDAP Store, in this case named WCAdmin, who will be assigned the role.
2. Assign the role. This can be done using wlst from the SOA Oracle home:

   For example:

```
cd ORACLE_HOME/common/bin/
wlst.sh

connect('weblogic','weblogic', 'SOAADMINHOST:7001')
revokeAppRole(appStripe="soa-infra", appRoleName="BPMWorkflowAdmin",
principalClass="oracle.security.jps.service.policystore.ApplicationRole",
principalName="SOAAdmin")
grantAppRole(appStripe="soa-infra", appRoleName="BPMWorkflowAdmin",
principalClass="weblogic.security.principal.WLSUserImpl",
principalName="WCAdmin")
```

10.5.3 Configure SOA Callback URLs

In order for Worklist to work properly when Oracle Access Manager is enabled, it is mandatory that the SOA Callback URLs are configured correctly. For information about callback URLs, see Section 5.17, "Setting the Frontend HTTP Host and Port."

The Callback Server URL should be set to `http://wcinternal.mycompany.com` for both the Callback Server URL and for the Server URL. To modify this URL using Fusion Middleware Control:

1. Select **Farm_wcedg_domain**, **SOA**, **soa-infra (wls_soa1)**, **SOA**, **Infrastructure**, **SOA Administration**, and then **Common Properties**.
2. Enter **http://wcinternal.mycompany.com**.
3. Restart the SOA severs.

10.6 Backing Up the Installation

After you have verified that the extended domain is working, back up the installation. This is a quick backup for the express purpose of immediate restore in case of problems in the further steps. The backup destination is the local disk. This backup can be discarded once the enterprise deployment setup is complete. At this point, the regular deployment-specific backup and recovery process can be initiated. The *Oracle Fusion Middleware Administrator's Guide* provides further details. For information on describing the Oracle HTTP Server data that must be backed up and restored, refer to the "Backup and Recovery Recommendations for Oracle HTTP Server" section in this guide. For information on how to recover components, see "Recovery of Components" and "Recovery After Loss of Component" sections in the guide. For recommendations specific to recovering from the loss of a host, see the "Recovering Oracle HTTP Server

to a Different Host" in the guide. Also refer to the *Oracle Database Backup and Recovery User's Guide* for information on database backup.

To back up the installation a this point, complete these steps:

1. Back up the web tier:
   a. Shut down the instance using `opmnctl`.

      ORACLE_BASE/admin/*instance_name*/bin/opmnctl stopall

   b. Back up the Middleware Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web.tar $MW_HOME
      ```

   c. Back up the Instance Home on the web tier using the following command (as root):

      ```
      tar -cvpf BACKUP_LOCATION/web_instance.tar $ORACLE_INSTANCE
      ```

   d. Start the instance using `opmnctl`:

      ORACLE_BASE/admin/*instance_name*/bin/opmnctl startall

2. Back up the AdminServer domain directory. Perform a backup to save your domain configuration. The configuration files all exist under the `ORACLE_BASE/admin/<domain_name>` directory.

   ```
   SOAHOST1> tar -cvpf edgdomainback.tar ORACLE_BASE/admin/domain_name
   ```

11 Managing the Topology

This chapter describes some operations that you can perform after you have set up the topology. These operations include monitoring, scaling, and backing up your topology.

This chapter contains the following sections:

11.1 Monitoring the Topology

For information on monitoring the topology, see chapter 15 of the *Oracle Fusion Middleware Administrator's Guide for Oracle WebCenter*.

11.2 Configuring UMS Drivers

UMS driver configuration is not automatically propagated in a SOA cluster. This implies that users need to:

1. Apply the configuration of UMS drivers in each and every one of the servers in the Enterprise Deployment topology that is using the driver.
2. When server migration is used, servers are moved to a different node's domain directory. It is necessary to pre-create the UMS driver configuration in the failover node. The UMS driver configuration file location is:

   ```
   ORACLE_BASE/admin/<domain_name>/mserver/<domain_name>/servers/<server_name>/
   tmp/_WL_user/<ums_driver_name>/*/configuration/driverconfig.xml
   ```

   (where '*' represents a directory whose name is randomly generated by WLS during deployment, for example, "3682yq").

In order to create the file in preparation for possible failovers, users can force a server migration and copy the file from the source node.

It is required to restart the driver for these changes to take effect (that is, for the driver to consume the modified configuration). To restart the driver:

1. Log on to the Oracle WebLogic Administration console.
2. Expand the environment node on the navigation tree.
3. Click on **Deployments**.
4. Select the driver.
5. Click **Stop->When work completes** and confirm the operation.
6. Wait for the driver to transition to the "Prepared" state (refresh the administration console page, if required).
7. Select the driver again, and click **Start->Servicing all requests** and confirm the operation.

Make sure that you verify in Oracle Enterprise Manager Fusion Middleware Control that the properties for the driver have been preserved.

11.3 Managing Space in the SOA Infrastructure Database

Although not all composites may use the database frequently, the service engines generate a considerable amount of data in the CUBE_INSTANCE and MEDIATOR_ INSTANCE schemas. Lack of space in the database may prevent SOA composites from functioning. Watch for generic errors, such as "oracle.fabric.common.FabricInvocationException" in the Oracle Enterprise Manager Fusion Middleware Control console (dashboard for instances). Search also in the SOA server's logs for errors, such as:

```
Error Code: 1691
...
ORA-01691: unable to extend lob segment
SOAINFRA.SYS_LOB0000108469C00017$$ by 128 in tablespace SOAINFRA
```

These messages are typically indicators of space issues in the database that may likely require adding more data files or more space to the existing files. The SOA Database Administrator should determine the extension policy and parameters to be used when adding space. Additionally, old composite instances can be purged to reduce the SOA Infrastructure database's size. Oracle does not recommend using the Oracle Enterprise Manager Fusion Middleware Control for this type of operation as in most cases the operations cause a transaction time out. There are specific packages provided with the Repository Creation Utility to purge instances. For example:

```
DECLARE
  FILTER INSTANCE_FILTER := INSTANCE_FILTER();

   MAX_INSTANCES NUMBER;
  DELETED_INSTANCES NUMBER;
  PURGE_PARTITIONED_DATA BOOLEAN := TRUE;
 BEGIN
   .
  FILTER.COMPOSITE_PARTITION_NAME:='default';
  FILTER.COMPOSITE_NAME := 'FlatStructure';
  FILTER.COMPOSITE_REVISION := '10.0';
  FILTER.STATE := fabric. STATE_UNKNOWN;
  FILTER.MIN_CREATED_DATE := to_timestamp('2010-09-07','YYYY-MM-DD');
  FILTER.MAX_CREATED_DATE := to_timestamp('2010-09-08','YYYY-MM-DD');
  MAX_INSTANCES := 1000;
 .
  DELETED_INSTANCES := FABRIC.DELETE_COMPOSITE_INSTANCES(
    FILTER => FILTER,
```

```
    MAX_INSTANCES => MAX_INSTANCES,
    PURGE_PARTITIONED_DATA => PURGE_PARTITIONED_DATA
  );
```

This deletes the first 1000 instances of the FlatStructure composite (version 10) created between '2010-09-07' and '2010-09-08' that are in "UNKNOWN" state. Refer to Chapter 8, "Managing SOA Composite Applications" in the *Oracle Fusion Middleware Administrator's Guide for Oracle SOA Suite* for more details on the possible operations included in the SQL packages provided. Always use the scripts provided for a correct purge. Deleting rows in just the composite_dn table may leave dangling references in other tables used by the Oracle Fusion Middleware SOA Infrastructure.

11.4 Scaling the Topology

You can scale out and or scale up the enterprise topology. When you scale up the topology, you add new managed servers to nodes that are already running on one or more managed servers. When you scale out the topology, you add new managed servers to new nodes.

This section covers includes the topics:

- Section 11.4.1, "Scaling Up the Topology (Adding Managed Servers to Existing Nodes)"
- Section 11.4.2, "Scaling Out the Topology (Adding Managed Servers to New Nodes)"

11.4.1 Scaling Up the Topology (Adding Managed Servers to Existing Nodes)

This section describes how to scale up a topology. Scaling up the topology includes adding managed servers to already existing nodes.

11.4.1.1 Scaling up SOA and WSM

When you scale up the topology, you already have a node that runs a managed server that is configured with SOA components or a managed server with WSM-PM. The node contains a WebLogic Server home and an Oracle Fusion Middleware SOA home in shared storage. Use existing these installations (such as WebLogic Server home, Oracle Fusion Middleware home, and domain directories), when you create the new managed servers called WLS_SOA and WLS_WSM. You do not need to install WLS or SOA binaries at a new location or to run `pack` and `unpack`.

1. Using the Oracle WebLogic Server Administration Console, clone WLS_SOA1 or WLS_WSM1 into a new managed server. The source managed server to clone should be one that already exists on the node where you want to run the new managed server.

   To clone a managed server, complete these steps:

   a. From the Domain Structure window of the Oracle WebLogic Server Administration Console, expand the **Environment** node and then **Servers**. The Summary of Servers page appears.

   b. Click **Lock and Edit** and select the managed server that you want to clone (for example, WLS_SOA1).

   c. Click **Clone**.

Name the new managed server WLS_SOA*n*, where *n* is a number that identifies the new managed server. In this case, assume that you are adding a new server to Node 1, where WLS_SOA1 was running.

The remainder of the steps assume that you are adding a new server to SOAHOST1, which is already running WLS_SOA1.

2. For the listen address, assign the host name or IP to use for this new managed server. If you are planning to use server migration as recommended for this server, enter the VIP (also called a floating IP) to enable it to move to another node. The VIP should be different from the one used by the managed server that is already running.
3. For WLS_WSM servers, run the Java Object Cache configuration utility again to include the new server in the JOC distributed cache as described in Section 4.17, "Configuring the Java Object Cache for Oracle WSM." You can use the same discover port for multiple WSM-PM servers in the same node. Repeat the steps provided in Section 4.17 for each WSM-PM server and the server list is updated.
4. Create JMS servers for SOA and UMS on the new managed server.
   a. Use the Oracle WebLogic Server Administration Console to create a new persistent store for the new SOAJMSServer (which will be created in a later step) and name it, for example, **SOAJMSFileStore_N**. Specify the path for the store as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure" as the directory for the JMS persistent stores:

      ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/SOAJMSFileStore_N

      Note: This directory must exist before the managed server is started or the start operation will fail.

   b. Create a new JMS server for SOA: for example, **SOAJMSServer_N**. Use the SOAJMSFileStore_N for this JMS server. Target the SOAJMSServer_N server to the recently created managed server (WLS_SOA*n*).
   c. Create a new persistence store for the new UMS JMS server (which will be created in a later step) and name it, for example, **UMSJMSFileStore_N**. Specify the path for the store as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure" as the directory for the JMS persistent stores:

      ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/UMSJMSFileStore_N

      Note: This directory must exist before the managed server is started or the start operation will fail.

      Note: It is also possible to assign SOAJMSFileStore_N as the store for the new UMS JMS servers. For the purpose of clarity and isolation, individual persistent stores are used in the following steps.

   d. Create a new JMS Server for UMS: for example, **UMSJMSServer_N**. Use the UMSJMSFileStore_N for this JMS server. Target the UMSJMSServer_N server to the recently created managed server (WLS_SOA*n*).

e. **For BPM Systems only**: Create a new persistence store for the new BPMJMSServer, for example, **BPMJMSFileStore_N**. Specify the path for the store. This should be a directory on shared storage as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure."

   ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/BPMJMSFileStore_N.

   Note: This directory must exist before the managed server is started or the start operation fails.

   You can also assign SOAJMSFileStore_N as store for the new BPM JMS Servers. For the purpose of clarity and isolation, individual persistent stores are used in the following steps.

f. **For BPM systems only**: Create a new JMS Server for BPM, for example, BPMJMSServer_N. Use the BPMJMSFileStore_N for this JMSServer. Target the BPMJMSServer_N Server to the recently created Managed Server (WLS_SOAn).

g. Target the UMSJMSSystemResource to the SOA_Cluster as it may have changed during extend operations. To do this, expand the **Services** node and then expand the **Messaging** node. Choose JMS Modules from the Domain Structure window of the Oracle WebLogic Server Administration Console. The JMS Modules page appears. Click UMSJMSSytemResource and open the Targets tab. Make sure all of the servers in the SOA_Cluster appear selected (including the recently cloned WLS_SOA*n*).

h. Update the SubDeployment Targets for SOA, UMS and BPM JMS Modules (if applicable) to include the recently created JMS servers.

   To do this, expand the **Services** node and then expand the **Messaging** node. Choose **JMS Modules** from the **Domain Structure** window of the Oracle WebLogic Server Administration Console. The JMS Modules page appears. Click on the JMS module (for SOA: SOAJMSModule, for BPM: BPMJMSMOdule and for UMS: UMSSYtemResource) represented as a hyperlink in the **Names** column of the table. The Settings page for module appears. Open the **SubDeployments** tab. The subdeployment for the deployment module appears.

   Note: This subdeployment module name is a random name in the form of SOAJMSServerXXXXXX, UMSJMSServerXXXXXX, or BPMJMSServerXXXXXX, resulting from the Configuration Wizard JMS configuration for the first two servers (WLS_SOA1 and WLS_SOA2).

   Click on it. Add the new JMS Server (for UMS add UMSJMSServer_N, for SOA add SOAJMSServer_N). Click **Save and Activate**.

5. Configuring Oracle Coherence for deploying composites for the new server as described in Section 5.5, "Configuring Oracle Coherence for Deploying Composites."

Note: Only the **localhost** field must be changed for the server. Replace the localhost with the listen address of the new server added:

```
Dtangosol.coherence.localhost=SOAHOST1VHNn
```

6. Configure the persistent store for the new server. This should be a location visible from other nodes as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure."

   From the Administration Console, select the **Server_name** , and then the **Services** tab. Under **Default Store**, in **Directory**, enter the path to the folder where you want the default persistent store to store its data files.

7. Disable host name verification for the new managed server. Before starting and verifying the WLS_SOAN managed server, you must disable host name verification. You can re-enable it after you have configured server certificates for the communication between the Oracle WebLogic Administration Server and the Node Manager in SOAHOST*n*.

   If the source server from which the new one has been cloned had already disabled hostname verification, these steps are not required (the hostname verification settings is propagated to the cloned server).

   To disable host name verification:

   a. In the Oracle Fusion Middleware Enterprise Manager Console, select **Oracle WebLogic Server Administration Console**.

   b. Expand the **Environment** node in the **Domain Structure** window.

   c. Click **Servers**.

      The Summary of Servers page appears.

   d. Select **WLS_SOAn** in the **Names** column of the table.

      The Settings page for server appears.

   e. Click the **SSL** tab.

   f. Click **Advanced**.

   g. Set Hostname Verification to **None**.

   h. Click **Save**.

8. Configure server migration for the new managed server.

   Note: Because this is a scale-up operation, the node should already contain a Node Manager and environment configured for server migration that includes netmask, interface, wlsifconfig script superuser privileges, and so on. The floating IP for the new SOA managed server should also be already present.

   To configure server migration using the Oracle WebLogic Server Administration Console, complete these steps:

   a. In the Domain Structure window, expand the **Environment** node and then click **Servers**. The Summary of Servers page appears.

b. Click the name of the server (represented as a hyperlink) in Name column of the table for which you want to configure migration. The settings page for the selected server appears.

c. Click the **Migration** subtab.

d. In the Migration Configuration section, select the servers that participate in migration in the Available window by clicking the right arrow. Select the same migration targets as for the servers that already exist on the node.

For example, for new managed servers on SOAHOST1, which is already running WLS_SOA1, select SOAHOST2. For new managed servers on SOAHOST2, which is already running WLS_SOA2, select SOAHOST1.

Note: The appropriate resources must be available to run the managed servers concurrently during migration.

---

e. Choose the **Automatic Server Migration Enabled** option. This enables the Node Manager to start a failed server on the target node automatically.

f. Click **Save**.

g. Restart the Administration Server, managed servers, and Node Manager.

To restart the Administration Server, use the procedure in Section 4.7, "Starting the Administration Server on SOAHOST1."

9. Update the cluster address to include the new server:

a. In the Administration Console, select **Environment**, and then **Cluster**.

b. Click the **SOA_Cluster** server.

The Settings screen for the SOA_Cluster appears.

c. Click **Lock and Edit**.

d. Add the new server's address and port to the **Cluster address** field. For example:
ADMINVHN:8011,SOAHOST2VHN1:8011,SOAHOST1VHN1:8001

e. Save and activate the changes.

10. Test server migration for this new server. To test migration, perform the following from the node where you added the new server:

a. Stop the WLS_SOAn managed server.

To do this, `run kill -9 <pid>` on the PID of the managed server. You can identify the PID of the node using `ps -ef | grep WLS_SOAn`.

b. Monitor the Node Manager Console for a message indicating that WLS_SOA1's floating IP has been disabled.

c. Wait for the Node Manager to attempt a second restart of WLS_SOAn. Node Manager waits for a fence period of 30 seconds before trying this restart.

d. Once Node Manager restarts the server, stop it again. The Node Manager should log a message indicating that the server will not be restarted again locally.

11.4.1.2 Scaling Up WebCenter

In this case, you already have a node that runs a managed server configured with Oracle WebCenter components. The node contains a Middleware home and a WebCenter directory in shared storage.

You can use the existing installations (Middleware home, and domain directories) for creating new Oracle WebCenter managed servers. You do not need to install WebCenter binaries in a new location, or run pack and unpack commands.

> **Note:** Running multiple managed servers on one node is supported only for the WC_Spaces servers and the WC_Portlet servers.

To scale up the topology:

1. Using the Administration Console, clone WC_Spaces1 or WC_Portlet1 into a new managed server. The source managed server to clone should be one that already exists on the node where you want to run the new managed server.

   To clone a managed server:

   a. In the Administration Console, select **Environment**, and then **Servers**.

   b. Select the managed server that you want to clone, for example, **WC_Spaces1** or **WC_Portlet1**.

   c. Select **Clone**.

   d. Name the new managed server SERVER_NAME*n*, where *n* is a number to identify the new managed server.

2. For the listen address, assign the host name or IP to use for this new managed server, which should be the same as an existing server.

   Ensure that the port number for this managed server is available on this node.

3. Add the new managed server to the Java Object Cache Cluster. For details, see Section 6.13, "Setting Up the Java Object Cache."

4. Reconfigure the Oracle HTTP Server module with the new member in the cluster. For more information see Section 6.19, "Configuring Oracle HTTP Server for the WC_Spacesn, WC_Portletn, and WC_Collaborationn Managed Servers on WCHOST2." Add the host and port of the new server to the end of the `WebLogicCluster` parameter.

   - For Spaces, add the member to the Location blocks for `/webcenter`, `/webcenterhelp`, `/rss`, `/rest`, `/wcsdocs`.
   - For Portlet, add the member to the Location blocks for `/portalTools`, `/wsrp-tools`, `/richtextportlet`, `/pageletadmin`, `/wcps`.

11.4.2 Scaling Out the Topology (Adding Managed Servers to New Nodes)

When you scaling out the topology, you add new managed servers configured with SOA and or WSM-PM to new nodes.

11.4.2.1 Scaling out SOA and WSM

Before performing the steps in this section, check that you meet these requirements:

Prerequisites

- There must be existing nodes running managed servers configured with SOA and WSM-PM within the topology
- The new node can access the existing home directories for WebLogic Server and SOA. (Use the existing installations in shared storage for creating a new WLS_SOA or WLS_WSM managed server. You do not need to install WebLogic Server or SOA binaries in a new location but you do need to run `pack` and `unpack` to bootstrap the domain configuration in the new node.)
- When an ORACLE_HOME or WL_HOME is shared by multiple servers in different nodes, it is recommended that you keep the Oracle Inventory and Middleware home list in those nodes updated for consistency in the installations and application of patches. To update the oraInventory in a node and "attach" an installation in a shared storage to it, use *ORACLE_HOME/oui/bin/attachHome.sh*. To update the Middleware home list to add or remove a WL_HOME, edit the *<user_home>/bea/beahomelist* file. See the steps below.

To scale out the topology, complete these steps:

1. On the new node, mount the existing MW_Home, which should include the SOA installation and the domain directory, and ensure that the new node has access to this directory, just like the rest of the nodes in the domain.
2. To attach ORACLE_HOME in shared storage to the local Oracle Inventory, execute the following command:

   ```
   SOAHOSTn>cd ORACLE_COMMON_HOME/oui/bin/attachHome.sh
   SOAHOSTn>./attachHome.sh -jreLoc ORACLE_BASE/fmw/jrockit_160_<version>
   ```

   To update the Middleware home list, create (or edit, if another WebLogic installation exists in the node) the *$HOME/bea/beahomelist* file and add `MW_HOME` to it.
3. Log in to the Oracle WebLogic Administration Console.
4. Create a new machine for the new node that will be used, and add the machine to the domain.
5. Update the machine's Node Manager's address to map the IP of the node that is being used for scale out.
6. Use the Oracle WebLogic Server Administration Console to clone WLS_SOA1/WLS_WSM1 into a new managed server. Name it WLS_SOAn/WLS_WSM-PMn, where *n* is a number.

   Note: These steps assume that you are adding a new server to node *n*, where no managed server was running previously.

7. Assign the host name or IP to use for the new managed server for the listen address of the managed server.

   If you are planning to use server migration for this server (which Oracle recommends) this should be the VIP (also called a floating IP) for the server. This VIP should be different from the one used for the existing managed server.
8. For WLS_WSM servers, run the Java Object Cache configuration utility again to include the new server in the JOC distributed cache as described in Section 4.17, "Configuring the Java Object Cache for Oracle WSM."

9. Create JMS Servers for SOA, BPM, (if applicable) and UMS on the new managed server.

   Note: These steps are not required for scaling out the WSM_PM managed server, only for WLS_SOA managed servers. They are not required either to scale up the BAM Web Applications system.

   Create the JMS servers for SOA and UMS as follows:

   a. Use the Oracle WebLogic Server Administration Console to create a new persistent store for the new SOAJMSServer (which will be created in a later step) and name it, for example, **SOAJMSFileStore_N**. Specify the path for the store as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure," as the directory for the JMS persistent stores:

      ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/SOAJMSFileStore_N

      Note: This directory must exist before the managed server is started or the start operation will fail.

   b. Create a new JMS server for SOA, for example, SOAJMSServer_N. Use the SOAJMSFileStore_N for this JMS server. Target the SOAJMSServer_N Server to the recently created managed server (WLS_SOA*n*).

   c. Create a new persistence store for the new UMSJMSServer, and name it, for example, **UMSJMSFileStore_N**. As the directory for the persistent store, specify the path recommended in Section 2.3, "Shared Storage and Recommended Directory Structure," as the directory for the JMS persistent stores:

      ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/UMSJMSFileStore _N

      Note: This directory must exist before the managed server is started or the start operation will fail.

      Note: It is also possible to assign SOAJMSFileStore_N as the store for the new UMS JMS servers. For the purpose of clarity and isolation, individual persistent stores are used in the following steps.

   d. Create a new JMS server for UMS: for example, **UMSJMSServer_N**. Use the UMSJMSFileStore_N for this JMS server. Target the UMSJMSServer_N Server to the recently created managed server (WLS_SOA*n*).

   e. **For BPM Systems only**: Create a new persistence store for the new BPMJMSServer, for example, **BPMJMSFileStore_N**. Specify the path for the store. This should be a directory on shared storage as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure."

      ORACLE_BASE/admin/*domain_name*/*cluster_name*/jms/BPMJMSFileStore_N.

Note: This directory must exist before the managed server is started or the start operation fails.

You can also assign SOAJMSFileStore_N as store for the new BPM JMS Servers. For the purpose of clarity and isolation, individual persistent stores are used in the following steps.

f. **For BPM systems only**: Create a new JMS Server for BPM, for example, BPMJMSServer_N. Use the BPMJMSFileStore_N for this JMSServer. Target the BPMJMSServer_N Server to the recently created Managed Server (WLS_SOAn).

g. Update the SubDeployment targets for the SOA JMS Module to include the recently created SOA JMS server. To do this, expand the **Services** node and then expand the **Messaging** node. Choose JMS Modules from the Domain Structure window of the Oracle WebLogic Server Administration Console. The JMS Modules page appears. Click SOAJMSModuleUDDs (represented as a hyperlink in the Names column of the table). The Settings page for SOAJMSModuleUDDs appears. Open the SubDeployments tab. The SOAJMSSubDM subdeployment appears.

Note: This subdeployment module results from updating the JMS configuration for the first two servers (WLS_SOA1 and WLS_SOA2) with the Uniform Distributed Destination Script (*soa-createUDD.py*), which is required for the initial Enterprise Deployment topology setup.

Click on it. Add the new JMS server for SOA called SOAJMSServer_N to this subdeployment. Click **Save**.

h. Target the UMSJMSSystemResource to the SOA_Cluster as it may have changed during extend operations. To do this, expand the **Services** node and then expand the **Messaging** node. Choose JMS Modules from the Domain Structure window of the Oracle WebLogic Server Administration Console. The JMS Modules page appears. Click UMSJMSSytemResource and open the Targets tab. Make sure all of the servers in the SOA_Cluster appear selected (including the recently cloned WLS_SOA*n*).

i. Update the SubDeployment Targets for SOA, UMS and BPM JMS Modules (if applicable) to include the recently created JMS servers.

To do this, expand the **Services** node and then expand the **Messaging** node. Choose **JMS Modules** from the **Domain Structure** window of the Oracle WebLogic Server Administration Console. The JMS Modules page appears. Click on the JMS module (for SOA: SOAJMSModule, for BPM: BPMJMSMOdule and for UMS: UMSSYtemResource) represented as a hyperlink in the **Names** column of the table. The Settings page for module appears. Open the **SubDeployments** tab. The subdeployment for the deployment module appears.

Note: This subdeployment module name is a random name in the form of SOAJMSServerXXXXXX, UMSJMSServerXXXXXX, or BPMJMSServerXXXXXX, resulting from the Configuration Wizard JMS configuration for the first two servers (WLS_SOA1 and WLS_SOA2).

Click on it. Add the new JMS Server (for UMS add UMSJMSServer_N, for SOA add SOAJMSServer_N). Click **Save and Activate**.

10. Run the `pack` command on SOAHOST1 to create a template pack as follows:

```
SOAHOST1> cd ORACLE_COMMON_HOME/common/bin

SOAHOST1> ./pack.sh -managed=true -domain=ORACLE_BASE/admin/domain_
name/aserver/domain_name
-template=soadomaintemplateScale.jar -template_name=soa_domain_templateScale
```

Run the following command on SOAHOST1 to copy the template file created to SOAHOSTN

```
SOAHOST1> scp soadomaintemplateScale.jar oracle@SOAHOSTN:/ ORACLE_COMMON_
HOME/common/bin
```

Run the `unpack` command on SOAHOSTN to unpack the template in the managed server domain directory as follows:

```
SOAHOSTN> cd ORACLE_COMMON_HOME/common/bin

SOAHOSTN> ./unpack.sh -domain=ORACLE_BASE/admin/domain_name
/mserver/domain_name/
-template=soadomaintemplateScale.jar
-app_dir=ORACLE_BASE/admin/domain_name/mserver/apps
```

11. Configuring Oracle Coherence for deploying composites for the new server as described in Section 5.5, "Configuring Oracle Coherence for Deploying Composites."

Note: Only the **localhost** field needs to be changed for the server. Replace the localhost with the listen address of the new server added:

```
Dtangosol.coherence.localhost=SOAHOST1VHNn
```

---

12. Configure the persistent store for the new server. This should be a location visible from other nodes as recommended in Section 2.3, "Shared Storage and Recommended Directory Structure."

    From the Administration Console, select the **Server_name**, and then the **Services** tab. Under **Default Store**, in **Directory**, enter the path to the folder where you want the default persistent store to store its data files.

13. Disable host name verification for the new managed server. Before starting and verifying the WLS_SOA*n* managed server, you must disable host name verification. You can re-enable it after you have configured server certificates for the communication between the Oracle WebLogic Administration Server and the Node Manager in SOAHOST*n*.

If the source server from which the new one has been cloned had already disabled hostname verification, these steps are not required (the hostname verification settings is propagated to the cloned server).

To disable host name verification:

a. In the Oracle Fusion Middleware Enterprise Manager Console, select **Oracle WebLogic Server Administration Console**.

b. Expand the **Environment** node in the **Domain Structure** window.

c. Click **Servers**.

   The Summary of Servers page appears.

d. Select **WLS_SOAn** in the **Names** column of the table.

   The Settings page for server appears.

e. Click the **SSL** tab.

f. Click **Advanced**.

g. Set Hostname Verification to **None**.

h. Click **Save**.

14. Start Node Manager on the new node. To start Node Manager, use the installation in shared storage from the existing nodes, and start Node Manager by passing the host name of the new node as a parameter as follows:

```
SOAHOSTN> WL_HOME/server/bin/startNodeManager
```

15. Start and test the new managed server from the Oracle WebLogic Server Administration Console.

    a. Ensure that the newly created managed server, WLS_SOAn, is running.

    b. Access the application on the load balancer (`https://soa.mycompany.com/soa-infra`). The application should be functional.

> **Note:** The HTTP Servers in the topology should round robin requests to the newly added server (a few requests, depending on the number of servers in the cluster, may be required to hit the new server). Its is not required to add all servers in a cluster to the WebLogicCluster directive in Oracle HTTP Server's `mod_wl_ohs.conf` file. However, routing to new servers in the cluster takes place only if at least one of the servers listed in the WebLogicCluster directive is running.

16. Configure server migration for the new managed server.

> **Note:** Because this new node uses an existing shared storage installation, the node already is using a Node Manager and an environment configured for server migration that includes netmask, interface, wlsifconfig script superuser privileges. The floating IP for the new SOA Managed Server is already present in the new node.

Log into the Oracle WebLogic Server Administration Console and configure server migration following these steps:

a. Expand the **Environment** node in the Domain Structure windows and then choose Servers. The Summary of Servers page appears.

b. Select the server (represented as hyperlink) for which you want to configure migration from the Names column of the table. The Setting page for that server appears.

c. Click the **Migration** tab.

d. In the Available field of the Migration Configuration section, click the right arrow to select the machines to which to allow migration.

Note: Specify the least-loaded machine as the migration target for the new server. The required capacity planning must be completed so that this node has enough available resources to sustain an additional managed server.

---

e. Select **Automatic Server Migration Enabled**. This enables the Node Manager to start a failed server on the target node automatically.

f. Click **Save**.

g. Restart the Administration Server, managed servers, and the Node Manager.

To restart the Administration Server, use the procedure in Section 4.7, "Starting the Administration Server on SOAHOST1."

17. Update the cluster address to include the new server:

a. In the Administration Console, select **Environment**, and then **Cluster**.

b. Click the **SOA_Cluster** server.

The Settings screen for the SOA_Cluster appears.

c. Click **Lock and Edit**.

d. Add the new server's address and port to the **Cluster address** field. For example:
ADMINVHN:8011,SOAHOST2VHN1:8011,SOAHOSTNVHN1:8001

e. Save and activate the changes.

18. Test server migration for this new server. Follow these steps from the node where you added the new server:

a. Abruptly stop the WLS_SOA*n* managed server by running `kill -9 <pid>` on the PID of the managed server. You can identify the PID of the node using `ps -ef | grep WLS_SOAn`.

b. In the Node Manager Console you should see a message indicating that WLS_SOA1's floating IP has been disabled.

c. Wait for the Node Manager to try a second restart of WLS_SOA*n*. Node Manager waits for a fence period of 30 seconds before trying this restart.

d. Once Node Manager restarts the server, stop it again. Now Node Manager should log a message indicating that the server will not be restarted again locally.

11.4.2.2 Scaling Out WebCenter

In scaling out your topology, you add new managed servers, configured with Oracle WebCenter applications, to new nodes.

Before performing the steps in this section, check that you meet these requirements:

- In your topology, there are existing nodes running managed servers configured with WebCenter applications.
- The new node can access the existing home directories for WebLogic Server and Oracle WebCenter. You use the existing installations in shared storage for creating a new managed server. There is no need to install WebLogic Server or WebCenter binaries in a new location, although you need to run pack and unpack to create a managed server domain.
- WC_Spaces and WC_Utilities servers must be either both scaled out on the new node, or both not scaled out. This is because of the local affinity between WebCenter Spaces and the Analytics application.

To scale out the topology:

1. On the new node, mount the existing Middleware home, which should include the WebCenter installation and the domain directory, and ensure that the new node has access to this directory, just as the rest of the nodes in the domain do.
2. To attach ORACLE_HOME in shared storage to the local Oracle Inventory, execute the following commands:

   ```
   WCHOSTn> cd ORACLE_BASE/product/fmw/wc/
   WCHOSTn> ./attachHome.sh -jreLoc ORACLE_BASE/fmw/jrockit_160_<version>
   ```

   To update the Middleware home list, create (or edit, if another WebLogic installation exists in the node) the *MW_HOME*/bea/beahomelist file and add *ORACLE_BASE*/product/fmw to it.
3. Log into the Oracle WebLogic Administration Console.
4. Create a new machine for the new node that will be used, and add the machine to the domain.
5. Update the machine's Node Manager's address to map the IP address of the node that is being used for scale out.
6. Use the Oracle WebLogic Server Administration Console to clone either WC_Spaces1 or WC_Portlet1 or WC_Collaboration1 or WC_Utilities1 into a new managed server. Name it WLS_XXX*n*, where *n* is a number and assign it to the new machine.
7. For the listen address, assign the host name or IP to use for the new managed server. Perform these steps to set the managed server listen address:
   a. Log into the Oracle WebLogic Server Administration Console.
   b. In the **Change Center**, click **Lock & Edit**.
   c. Expand the **Environment** node in the **Domain Structure** window.
   d. Click **Servers**. The Summary of Servers page appears.
   e. Select the managed server with the listen address you want to update in the **Names** column of the table. The Setting page for that managed server appears.
   f. Set the **Listen Address** to WCHOST*n* where WCHOST*n* is the DNS name of your new machine.

g. Click **Save**.

h. Save and activate the changes.

The changes do not take effect until the managed server is restarted.

8. Run the pack command on SOAHOST1 to create a template pack and unpack onto WCHOST*n*.

These steps are documented in Section 6.7, "Propagating the Domain Configuration to SOAHOST2, WCHOST1, and WCHOST2 Using the unpack Utility."

9. Start the Node Manager on the new node. To start the Node Manager, use the installation in shared storage from the existing nodes, and start Node Manager by passing the host name of the new node as a parameter as follows:

```
WCHOSTn> WL_HOME/server/bin/startNodeManager new_node_ip
```

10. If this is a new Collaboration managed server:

a. Ensure that you have followed the steps in Section 6.15, "Configuring Clustering for Discussions Server," to configure clustering for the new Discussions Server.

b. Ensure also that the steps in Section 6.14, "Converting Discussions Forum from Multicast to Unicast" are performed, using the hostname of the new host for the `coherence.localhost` parameter.

11. If this is a new Utilities managed server, ensure that Activity Graph is disabled by following the steps in Section 6.17, "Configuring Activity Graph." Ensure also that the steps for configuring a new Analytics Collector in Section 6.16, "Configuring the Analytics Collectors" have been followed for the Utilities and the local Spaces Server.

12. Start and test the new managed server from the Oracle WebLogic Server Administration Console:

a. Ensure that the newly created managed server, WLS_SOAn, is running.

b. Access the application on the load balancer (`https://soa.mycompany.com/soa-infra`). The application should be functional.

Note: The HTTP Servers in the topology should round robin requests to the newly added server (a few requests, depending on the number of servers in the cluster, may be required to hit the new server). Its is not required to add all servers in a cluster to the WebLogicCluster directive in Oracle HTTP Server's `mod_wl_ohs.conf` file. However, routing to new servers in the cluster takes place only if at least one of the servers listed in the WebLogicCluster directive is running.

11.5 Performing Backups and Recoveries

Table 11–1 lists the static artifacts to back up in the 11*g* Oracle WebCenter enterprise deployment.

Table 11–1 Static Artifacts to Back Up in the 11g Oracle WebCenter Enterprise Deployment

Type	Host	Location	Tier
ORACLE HOME (DB)	RAC Database hosts - CUSTDBHOST1 and CUSTDBHOST2	The location is user-defined	Directory Tier
MW HOME (SOA + WC)	SOAHOST1 and SOAHOST2 - SOA WCHOST1 and WCHOST2 - WC	MW_HOME on all hosts	Application Tier
ORACLE HOME (OHS)	WEBHOST1 and WEBHOST2	ORACLE_BASE/admin/<instance_name>	Web Tier
ORACLE HOME (OCS)	WCHOST1 and WCHOST2	On shared disk: /share/oracle/ucm On each host, local files at ORACLE_HOME/ucm	Application Tier
Installation-related files		OraInventory, <user_home>/bea/beahomelist, oraInst.loc, oratab	

Table 11–2 lists the runtime artifacts for back up in the 11g Oracle WebCenter enterprise deployment.

Table 11–2 Run-Time Artifacts to Back Up in the 11g Oracle WebCenter Enterprise Deployment

Type	Host	Location	Tier
DOMAIN HOME	SOAHOST1 SOAHOST2 WCHOST1 WCHOST2	ORACLE_BASE/admin/<domain_name>/mserver/<domain_name>	Application Tier
Application artifacts (ear and war files)	SOAHOST1 SOAHOST2 WCHOST1 WCHOST2	Look at all the deployments through admin console and get all the application artifacts	Application Tier
OHS INSTANCE HOME	WEBHOST1 and WEBHOST2	On WEBHOST1, ORACLE_HOME/ohs_1/instances/instance1 On WEBHOST2, ORACLE_HOME/ohs_2/instances/instance2	Web Tier
OHS OCS configuration files	WEBHOST1 and WEBHOST2	On each host, at /share/oracle/ucm, which is a local file system.	Web Tier
RAC databases	CUSTDBHOST1 and CUSTDBHOST2	The location is user-defined	Directory Tier
OCS content repository		Database-based	Directory Tier

For more information on backup and recovery of Oracle Fusion Middleware components, see *Oracle Fusion Middleware Administrator's Guide*.

Note: ORACLE_HOME should be backed up if any changes are made to the XEngine configuration that are part of your B2B setup. These files are located under `ORACLE_HOME/soa/thirdparty/edifecs/XEngine`. To back up ORACLE_HOME, execute the following command:

```
SOAHOST1> tar -cvpf fmwhomeback.tar MW_HOME
```

11.6 Troubleshooting

This section covers the following topics:

- Section 11.6.1, "Administration Server Fails to Start After a Manual Failover"
- Section 11.6.2, "Error While Activating Changes in Administration Console"
- Section 11.6.3, "OAM Configuration Tool Does Not Remove URLs"
- Section 11.6.4, "Portlet Unavailable After Database Failover"
- Section 11.6.5, "Redirecting of Users to Login Screen After Activating Changes in Administration Console"
- Section 11.6.6, "Redirecting of Users to Administration Console's Home Page After Activating Changes to OAM"
- Section 11.6.7, "Configured JOC Port Already in Use"
- Section 11.6.8, "Restoring a JMS Configuration"
- Section 11.6.9, "Spaces Server Does Not Start after Propagation of Domain"

11.6.1 Administration Server Fails to Start After a Manual Failover

Problem: Administration Server fails to start after the Administration Server node failed and manual failover to another nodes is performed. The Administration Server output log reports the following:

```
<Feb 19, 2009 3:43:05 AM PST> <Warning> <EmbeddedLDAP> <BEA-171520> <Could not
obtain an exclusive lock for directory: ORACLE_BASE/admin/soadomain/aserver/
soadomain/servers/AdminServer/data/ldap/ldapfiles. Waiting for 10 seconds and then
retrying in case existing WebLogic Server is still shutting down.>
```

Solution: When restoring a node after a node crash and using shared storage for the domain directory, you may see this error in the log for the Administration Server due to unsuccessful lock cleanup. To resolve this error, remove the file *ORACLE_BASE/admin/<domain_name>/aserver/<domain_name>/servers/AdminServer/data/ldap/ldapfiles/EmbeddedLDAP.lok*.

11.6.2 Error While Activating Changes in Administration Console

Problem: Activation of changes in Administration Console fails after changes to a server's start configuration have been performed. The Administration Console reports the following when clicking "Activate Changes":

```
An error occurred during activation of changes, please see the log for details.
 [Management:141190]The commit phase of the configuration update failed with an
```

```
exception:
In production mode, it's not allowed to set a clear text value to the property:
PasswordEncrypted of ServerStartMBean
```

Solution: This may happen when start parameters are changed for a server in the Administration Console. In this case, either provide username/password information in the server start configuration in the Administration Console for the specific server whose configuration was being changed, or remove the `<password-encrypted></password-encrypted>` entry in the *config.xml* file (this requires a restart of the Administration Server).

11.6.3 OAM Configuration Tool Does Not Remove URLs

Problem: The OAM Configuration Tool has been used and a set of URLs was added to the policies in Oracle Access Manager. One of multiple URLs had a typo. Executing the OAM Configuration Tool again with the correct URLs completes successfully; however, when accessing Policy Manager, the incorrect URL is still there.

Solution: The OAM Configuration Tool only adds new URLs to existing policies when executed with the same app_domain name. To remove a URL, use the Policy Manager Console in OAM. Log on to the Access Administration site for OAM, click on My Policy Domains, click on the created policy domain (SOA_EDG), then on the Resources tab, and remove the incorrect URLs.

11.6.4 Portlet Unavailable After Database Failover

Problem: While creating a page inside WebCenter Spaces, if you add a portlet to the page and a database failover occurs, an error component may added to the page with the following message showing on it:

```
"Error"
"Portlet unavailable"
```

This message remains even if you refresh the page or log out and back in again.

Solution: To resolve this issue, delete the component and add it again.

11.6.5 Redirecting of Users to Login Screen After Activating Changes in Administration Console

Problem: After configuring OHS and load balancer to access the Oracle WebLogic Administration Console, some activation changes cause the redirection to the login screen for the admin console.

Solution: This is the result of the console attempting to follow changes to port, channel, and security settings as a user makes these changes. For certain changes, the console may redirect to the Administration Server's listen address. Activation is completed regardless of the redirection. It is not required to log in again; users can simply update the URL to `wc.mycompany.com/console/console.portal` and directly access the home page for the Administration Console.

Note: This problem will not occur if you have disabled tracking of the changes described in this section.

11.6.6 Redirecting of Users to Administration Console's Home Page After Activating Changes to OAM

Problem: After configuring OAM, some activation changes cause the redirection to the Administration Console's home page (instead of the context menu where the activation was performed).

Solution: This is expected when OAM SSO is configured and is the result of the redirections performed by the Administration Server. Activation is completed regardless of the redirection. If required, users may "manually" navigate again to the desired context menu.

11.6.7 Configured JOC Port Already in Use

Problem: Attempts to start a Managed Server that uses the Java Object Cache, such as OWSM or WebCenter Spaces Managed Servers, fail. The following errors appear in the logs:

```
J2EE JOC-058 distributed cache initialization failure
J2EE JOC-043 base exception:
J2EE JOC-803 unexpected EOF during read.
```

Solution: Another process is using the same port that JOC is attempting to obtain. Either stop that process, or reconfigure JOC for this cluster to use another port in the recommended port range.

11.6.8 Restoring a JMS Configuration

Problem: A mistake in the parameters passed to the `soa-createUDD.py` script, or some other mistake causes the JMS configuration for SOA or BAM clusters to fail.

Solution: Use `soa-createUDD.py` to restore the configuration.

If a mistake is made while running the `soa-createUDD.py` script after the SOA cluster is created from the Oracle Fusion Middleware Configuration Wizard (an incorrect option is used, a target is modified, or a module is deleted accidentally). In these situations you can use the `soa-createUDD.py` script to restore the appropriate JMS configuration using the following steps:

1. Delete the existing SOA JMS resources (JMS Modules owned by the soa-infrastructure system).
2. Run the `soa-createUDD.py` again. The script assume the JMS Servers created for SOA are preserved and creates the destinations and subdeployment modules required to use Uniform Distributed Destinations for SOA. In this case, the script should be executed with the option `--soacluster`. After running the script again, verified from the WebLogic Server Administration Console that the following artifacts exist (**Domain Structure**, **Services**, **Messaging**, **JMS Modules**):

```
SOAJMSModuleUDDs        ---->SOAJMSSubDM targeted to SOAJMSServer_auto_1 and
SOAJMSServer_auto_2
UMSJMSSystemResource    ---->UMSJMSSubDMSOA targeted to UMSJMSServer_auto_1 and
UMSJMSServer_auto_2
```

11.6.9 Spaces Server Does Not Start after Propagation of Domain

Problem: Spaces server fails to start after propagation of the domain configuration to SOAHOST2, WCHOST1 and WCHOST2 using the unpack utility:

```
[Deployer:149158]No application files exist at '/u01/app/oracle/admin/wcedg_
domain/apps/wcedg_domain/custom.webcenter.spaces.fwk'...
```

Solution: Copy all the files from the managed server applications location to the one expected by the managed server deployer. For example:

```
cp /u01/app/oracle/admin/wcedg_domain/mserver/apps/* /u01/app/oracle/admin/wcedg_
domain/apps/wcedg_domain/
```

Note: Make sure `/u01/app/oracle/admin/wcedg_domain/apps/wcedg_domain/` exists before copying the contents.

11.7 Best Practices

This section covers the following topics:

- Section 11.7.1, "Preventing Timeouts for SQLNet Connections"
- Section 11.7.2, "Auditing"

11.7.1 Preventing Timeouts for SQLNet Connections

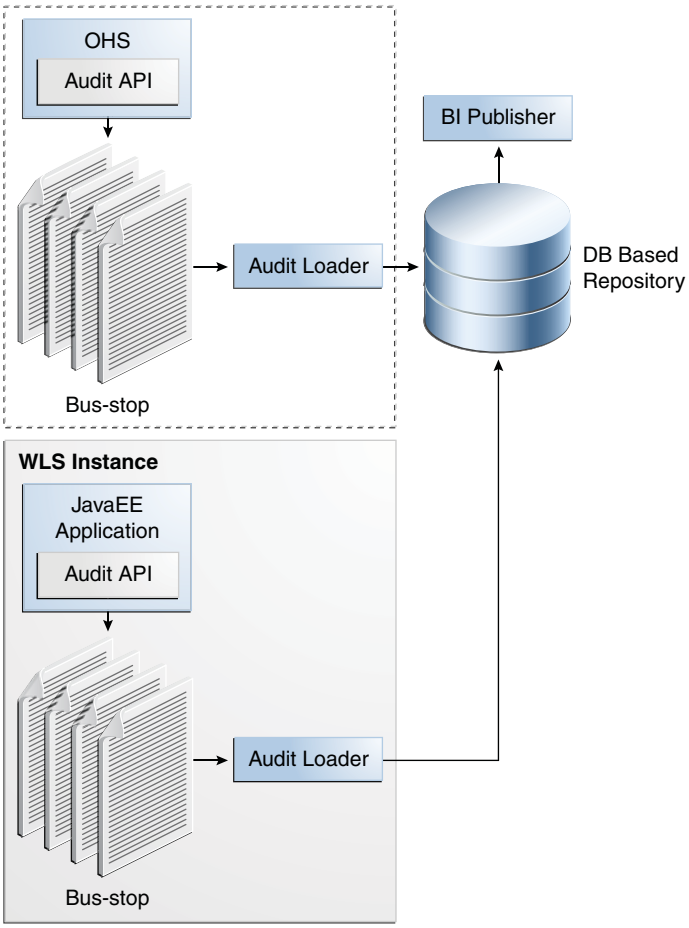
Much of the Enterprise Deployment production deployment involves firewalls. Because database connections are made across firewalls, Oracle recommends that the firewall be configured so that the database connection is not timed out. For Oracle Real Application Clusters (RAC), the database connections are made on Oracle RAC VIPs and the database listener port. You must configure the firewall to not time out such connections. If such a configuration is not possible, set the`*SQLNET.EXPIRE_TIME=n*` parameter in the `ORACLE_HOME/network/admin/sqlnet.ora` file on the database server, where `n` is the time in minutes. Set this value to less than the known value of the timeout for the network device (that is, a firewall). For RAC, set this parameter in all of the Oracle home directories.

11.7.2 Auditing

Oracle Fusion Middleware Audit Framework is a new service in Oracle Fusion Middleware 11*g*, designed to provide a centralized audit framework for the middleware family of products. The framework provides audit service for platform components such as Oracle Platform Security Services (OPSS) and Oracle Web Services. It also provides a framework for JavaEE applications, starting with Oracle's own JavaEE components. JavaEE applications will be able to create application-specific audit events. For non-JavaEE Oracle components in the middleware such as C or JavaSE components, the audit framework also provides an end-to-end structure similar to that for JavaEE applications.

Figure 11–1 is a high-level architectural diagram of the Oracle Fusion Middleware Audit Framework.

Figure 11–1 Audit Event Flow



The Oracle Fusion Middleware Audit Framework consists of the following key components:

- **Audit APIs**

  These are APIs provided by the audit framework for any audit-aware components integrating with the Oracle Fusion Middleware Audit Framework. During runtime, applications may call these APIs where appropriate to audit the necessary information about a particular event happening in the application code. The interface allows applications to specify event details such as username and other attributes needed to provide the context of the event being audited.

- **Audit Events and Configuration**

  The Oracle Fusion Middleware Audit Framework provides a set of generic events for convenient mapping to application audit events. Some of these include common events such as authentication. The framework also allows applications to define application-specific events.

  These event definitions and configurations are implemented as part of the audit service in Oracle Platform Security Services. Configurations can be updated through Enterprise Manager (UI) and WLST (command-line tool).

- **Audit Bus-stop**

  Bus-stops are local files containing audit data before they are pushed to the audit repository. In the event where no database repository is configured, these bus-stop

files can be used as a file-based audit repository. The bus-stop files are simple text files that can be queried easily to look up specific audit events. When a DB-based repository is in place, the bus-stop acts as an intermediary between the component and the audit repository. The local files are periodically uploaded to the audit repository based on a configurable time interval.

- **Audit Loader**

  As the name implies, audit loader loads the files from the audit bus-stop into the audit repository. In the case of platform and JavaEE application audit, the audit loader is started as part of the JavaEE container start-up. In the case of system components, the audit loader is a periodically spawned process.

- **Audit Repository**

  Audit Repository contains a pre-defined Oracle Fusion Middleware Audit Framework schema, created by Repository Creation Utility (RCU). Once configured, all the audit loaders are aware of the repository and upload data to it periodically. The audit data in the audit repository is expected to be cumulative and will grow overtime. Ideally, this should not be an operational database used by any other applications - rather, it should be a standalone RDBMS used for audit purposes only. In a highly available configuration, Oracle recommends that you use an Oracle Real Application Clusters (RAC) database as the audit data store.

- **Oracle Business Intelligence Publisher**

  The data in the audit repository is exposed through pre-defined reports in Oracle Business Intelligence Publisher. The reports allow users to drill down the audit data based on various criteria. For example:

  - Username
  - Time Range
  - Application Type
  - Execution Context Identifier (ECID)

For more introductory information for the Oracle Fusion Middleware Audit Framework, see the "Introduction to Oracle Fusion Middleware Audit Framework" chapter in the *Oracle Fusion Middleware Security Guide*.

For information on how to configure the repository for Oracle Fusion Middleware Audit Framework, see the "Configuring and Managing Auditing" chapter in the *Oracle Fusion Middleware Security Guide*.

The Enterprise Deployment topology does not include Oracle Fusion Middleware Audit Framework configuration. The ability to generate audit data to the bus-stop files and the configuration of the audit loader will be available once the products are installed. The main consideration is the audit database repository where the audit data is stored. Because of the volume and the historical nature of the audit data, it is strongly recommended that customers use a separate database from the operational store or stores being used for other middleware components.

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