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Installation Guide

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Glossary

Preface

The *Oracle Fusion Applications Installation Guide* provides information about setting up Oracle Fusion Applications Provisioning and using it to install and provision a new Oracle Fusion Applications environment. It includes specific instructions for installing prerequisite components; installing, configuring, and deploying applications product offerings; and deinstalling an environment.

If Oracle VM environments are used, see the *Oracle Fusion Applications Installing and Managing in an Oracle VM Environment Installation Guide* guide. This guide describes how to install, configure, and manage instances of Oracle VM environments created from the Oracle VM templates for Oracle Fusion Applications. This document is applicable for the environments created from the official releases of Oracle VM templates for Oracle Fusion Applications Release 12 (11.12.x.0.0) and higher. The content is not applicable for any Oracle VM environments that are created using other methods.

In this user guide, the nomenclature “11.12.x.0.0”, where “x” is a number, is used to indicate the release and patch releases for which the guide is applicable. When using this document, be sure to replace “x” with the number of the release that is being used.

Audience

This document is intended for users who are provisioning an Oracle Fusion Applications environment and installing product offerings for the first time and who are comfortable with system administration tasks such as installing Oracle Identity Management, setting up and configuring Oracle Database 12*c* (12.1.0.2), and applying patches on the computer where the product offerings are installed. Users installing on a UNIX system need `root` access to run some of the scripts.

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Related Documents

For more information, see the following documents:

- *Oracle Fusion Applications Administrator's Guide*
- *Oracle Fusion Applications Patching Guide*
- *Oracle Fusion Applications Upgrade Guide*
- *Oracle Fusion Applications Installing and Managing in an Oracle VM Environment Installation Guide*
- *Oracle Fusion Applications Installation Workbook*
- *Oracle Business Intelligence Applications Installation Guide*
- *Oracle Database Installation Guide* for a specific platform
- *Oracle Fusion Applications Common Implementation Guide*

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.

News

This section introduces the new and changed installation features of Oracle Fusion Applications that are described in this guide, and provides pointers to additional information.

New and Changed Features for Release 12 (11.12.x.0.0)

Oracle Fusion Applications Release 12 (11.12.x.0.0) includes the following new and changed features for this document.

- The nomenclature “11.12.x.0.0”, where “x” is a number, is used to indicate the release and patch releases for which the guide is applicable.
- Added HED related schemas and also FUSION_OPSS schema to section Schema and Password Requirements (page 4-25).
- Removed information about AIX platform as this operating system is not supported.
- Updated recommended initialization parameters for Oracle Database. See Minimum Configuration Parameteres for Oracle Database (page 8-4).
- Removed note about running the Fusion Applications provisioning wizard in Windows platforms as it is not supported.
- Updated values for the Database Configuration screen in the Fusion Applications provisioning wizard. See Wizard Screens and Instructions (page 12-5).
- Updated values for the Identity Management Configuration screen in the Fusion Applications provisioning wizard. See Identity Management Configuration (page 12-26).
- Updated values for the Access and Policy Management Configuration screen in the Fusion Applications provisioning wizards. See Access and Policy Management Configuration (page 12-28).

1
Overview

This section introduces Oracle Fusion Applications Provisioning and discusses how its interrelated components orchestrate the installation, configuration, and deployment of Oracle Fusion Applications database, product offerings and their middleware dependencies.
It includes the following topics:

- Introduction to Installing Oracle Fusion Applications (page 1-1)
- Roles and Responsibilities (page 1-2)
- Prerequisites and Dependencies (page 1-8)
- Features of Provisioning (page 1-10)
- Provision a Multiple Host Installation (page 1-14)
- Plan for Provisioning (page 1-15)
- What to Do Next (page 1-16)

1.1 Introduction to Installing Oracle Fusion Applications

Provisioning is the entire set of operations required to install, configure, and deploy applications product offerings from a system point of view. It performs these operations:

- Installation provides the operations related to laying down all the component needed to create an Oracle Fusion Applications environment
- Configuration tailors components based on the applications topology, the creation of Oracle WebLogic Server Managed Servers and clusters, and the updating of endpoints and virtual hosts
- Deployment starts the Managed Servers and clusters and facilitates the actual use of product offerings

This orchestration by a single processing engine ensures that all components interact smoothly and consistently in the applications environment.

The main tasks to be completed when provisioning an Oracle Fusion Applications environment are:

- **Planning**: The first step to provisioning an Oracle Fusion Applications environment is planning the environment, specifically its topology, including the number and configuration of hardware units; and its components, including: storage, network, database, Oracle Identity Management, and security configuration. For more information about planning an environment, see Plan the Topology and Provisioning of the Installation (page 3-1).
- **Preparing**: Prior to provisioning an Oracle Fusion Applications environment, hardware and networking components must be prepared and configured, shared disk storage must be set up. The relevant software dependencies must be

installed. For more information about preparing components for an installation, see Prepare for an Installation (page 5-1).

- **Installing Databases**: The next step is installing the databases for Oracle Fusion Applications, including the Oracle Identity Management and Oracle Fusion Applications transaction databases. Repository creation utilities are provided to help create the repositories required for an Oracle Fusion Applications environment. For more information about installing the databases for Oracle Fusion Applications, see Install Databases for Oracle Identity Management (page 7-1) and Install Oracle Fusion Applications Transaction Database (page 8-1).
- **Provisioning**: After the environment has been planned, prepared, and the relevant databases installed, it is time to provision the Oracle Identity Management and Oracle Fusion Applications environments. The provisioning process installs and configures Oracle Identity Management and Oracle Fusion Applications and all their related components, such as the product offerings to be installed and the applications used to manage, monitor, and troubleshoot an Oracle Fusion Applications environment. Provisioning frameworks are installed to help accomplish this task. For more information about the provisioning procedure, see Oracle Identity Management Provisioning (page 10-1) and Create a Response File for a New Oracle Fusion Applications Environment (page 12-1).
- **Completing Post-Install Tasks**: Having provisioned a working Oracle Fusion Applications environment, the next step is completing a set of post-installation tasks. These tasks include a number of required and optional steps, and specific steps required for particular product offerings. For more information about the post-installation tasks, see Complete Mandatory Post-Installation Tasks (page 15-1).

The process of provisioning is undertaken by a team composed of various specialists and technicians, each taking on different roles and responsibilities, as discussed in greater detail in Roles and Responsibilities (page 1-2). All told, a typical installation and provisioning process can take about five to fourteen days, not counting post-installation tasks.

1.2 Roles and Responsibilities

There are a number of roles and responsibilities to be undertaken in the context of provisioning Oracle Fusion Applications. These include the following:

- Business sponsor
- Project manager
- IT director
- Architect
- System administrator
- Network engineer
- Database administrator
- Oracle Identity Management and security specialist
- Oracle Fusion Applications technical lead or system administrator
- Oracle Fusion Applications functional lead
- Oracle Fusion Applications developer

- Oracle Business Intelligence and DW reporting specialist
- Support technician
- Oracle Fusion Applications system integrator

Some of these roles may overlap, and the same individual may fulfill more than one role. For example, many Oracle Fusion Applications technical leads are also database administrators, and an IT director may also act as the project manager for the duration of an Oracle Fusion Applications deployment. Similarly, Oracle Fusion Applications technical leads may inherit support technician duties after most of the deployment tasks have been completed.

On the other hand, it is common to have a number of people on call to fulfill a particular role. For example, it is typical to have a pool of system or database administrators on call at all times during the course of a deployment, as it is critical for back-end systems to be available and responsive so as to complete technical setup and configuration. For training purposes, several individuals may share principal Oracle Fusion Applications technical or functional Lead responsibilities among themselves.

The mapping of deployment tasks and responsibilities to organizational roles may vary across different types of enterprises depending on corporate culture and organizational structure.

1.2.1 Business Sponsor

The business sponsor is responsible for the Oracle Fusion Applications deployment, and determines the business needs to be met by the deployment. As a business sponsor, work with Oracle to determine licensing, sizing, functional requirements, and selecting Oracle Fusion Applications components. Work also with systems integrators who assist with deployment and functional setup.

In the context of the organization, determine the budget, scheduling, resource allocation, and staffing for the deployment and ongoing support after rolling out the system.

The primary tasks of a business sponsor are as follows:

- Communicating requirements, licensing, sizing
- Budgeting
- High level scheduling
- Managing system interfaces (functional)
- Staffing and project management
- Filling out the Oracle Fusion Applications Offerings table in the Provisioning tab in the *Oracle Fusion Applications Installation Workbook* .

1.2.2 Project Manager

The project manager is responsible for the day-to-day management of the deployment on several levels. This mainly involves reconciling the aggressive schedules set by business sponsors with the realities of staffing resources.

The main tasks include creating and managing the detailed project schedule, breaking down sets of tasks, and assigning them to team members acting in specialized

functional roles. Daily project management requires to monitor successful task completion against milestone targets identified in the project schedule. The project manager may need to re-allocate resources to keep the deployment project on schedule. The project manager may also need to adjust the project schedule on occasion due to unexpected events or changes in staffing resources.

The primary tasks of a project manager are:

- Coordinating among staff performing technical and functional roles
- Building the project time line and task list
- Monitoring completed tasks against the project time line
- Project status reporting
- Managing the completion of the *Oracle Fusion Applications Installation Workbook*

1.2.3 IT Director

The IT director oversees and prioritizes all past, present, and future IT projects. The IT director works closely with business sponsors to assess organizational needs and the importance of the Oracle Fusion Applications deployment relative to other ongoing projects. The IT director also coordinates resource allocations and staffing requirements with the project manager.

The primary tasks of an IT director are:

- Managing the following:
  - Staffing and resource allocations
  - Budgeting
  - System interfaces
- Managing licensing and sizing
- Project management
- Making topology decisions
- Coordinating the completion of the *Oracle Fusion Applications Installation Workbook*

1.2.4 Architect

The job of the enterprise architect straddles the middle ground between fulfillment of business requirements and technical implementation. The enterprise architect is responsible for making most of the key technical decisions after consulting with IT specialists in the system administration, networking, security, and database roles.

Along with the system administrator, the enterprise architect ensures the technical correctness and completeness of the system in its entirety, including the base Oracle Fusion Applications installation and all extensions, customizations, and integrations with other external systems.

The primary tasks of an enterprise architect are:

- Making topology decisions
- Managing system interfaces

- Delineating security requirements
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook*:
  - Environment tab: Environment Info table
  - Provisioning tab: Post-Install Tasks table
  - Topology tab: All
  - Network - Virtual Hosts tab: All

1.2.5 System Administrator

The system administrator is responsible for the critical hardware and operating system layers of the Oracle Fusion Applications deployment. The system administrator ensures that all hardware meets with organizational standards and, along with the architect, that operating systems are configured in accordance with Oracle Fusion Applications requirements.

The system administrator is also responsible for overall systems testing, and coordinating all necessary system and subcomponent migrations from testing to QA, and, finally, production platforms.

The primary tasks of the system administrator are:

- Procuring and setting up hardware
- Installing and configuring operating systems
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook*:
  - Topology tab: All
  - Storage tab: All
  - Network - Ports tab: All

1.2.6 Network Engineer

The network engineer is responsible for the setup and ongoing maintenance and monitoring of all components that facilitate communication among computers within the enterprise computing infrastructure. The tasks of a network engineer include the configuration and setup of machine interfaces such as hosts tables, network cards, network interfaces, IP address allocations, and network equipment such as switches, routers, gateways, and load balancers.

The primary tasks of a network engineer are:

- Setting up and configuring machine interfaces and network equipment
- Monitoring and maintaining the network infrastructure
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook*:
  - Environment tab: Email Server table
  - Environment tab: Web Proxy table
  - Topology tab: Topology table

  - Network - Virtual Hosts tab: All
  - Storage tab: All
  - Network - Ports tab: All

1.2.7 Database Engineer

The database engineer manages the database layer of the Oracle Fusion Applications deployment, and fills out the Database tab in the *Oracle Fusion Applications Installation Workbook*.

1.2.8 Oracle Identity Management and Security Specialist

A security specialist creates and maintains policies to protect corporate data and computing resources from a variety of real and potential threats.

In the context of Oracle Identity Management, the tasks of a security specialist include creating and managing the enterprise computing components that authenticate, authorize, and account for individual access to computing resources and systems. The security specialist also controls the corporate LDAP directories and their associated AAA systems.

Oracle Fusion Applications deployments require creating and configuring identity and policy stores that may differ from pre-existing Oracle Identity Management components in the enterprise. As such, the security specialist must coordinate the effort to install and manage Oracle Identity Management components bearing in mind the effects the new components may have on existing components in the enterprise.

The primary tasks of a security specialist are:

- Creating and managing authentication and authorization enterprise computing components
- Creating and configuring identity and policy stores for Oracle Identity Management, in conjunction with existing Oracle Identity Management components
- Managing security certificates
- Managing password policies (functional security)
- Managing roles and responsibilities (functional setup)
- Managing system account password maintenance policies
- Setting up the database (Vault, if applicable)
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook*:
  - Provisioning tab: Oracle Identity Management Products table
  - Identity Management tab: All
  - SSL and Certificates tab: All
  - Topology tab: DMZ column in the Topology table
  - Environment tab: Web Proxy table

1.2.9 Oracle Fusion Applications Technical Lead or System Administrator

The Oracle Fusion Applications technical lead works closely with other IT specialists, including the database, network, and system administrators as they install and configure the Oracle Fusion Applications infrastructure. The main responsibility of the technical lead is the hands-on management of low-level tasks to be completed during technical setup and validation.

The primary tasks of a technical lead are:

- Managing technical setup and validation tasks during Oracle Fusion Applications deployment
- Managing system interfaces

1.2.10 Oracle Fusion Applications Functional Lead

The Oracle Fusion Applications functional lead is responsible for the functional setup of Oracle Fusion Applications following the completion of its technical deployment. The functional lead works closely with the business sponsor to ensure the system is configured in accordance with business requirements, and with technical leads and architects to ensure the successful completion of post-installation tasks.

It is useful to have a background in performing systems integration and specializing in the Oracle Fusion Applications pillars being installed and configured.

The primary tasks of a functional lead are:

- Managing the functional setup of Oracle Fusion Applications
- Managing system interfaces
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook* :
  - Provisioning tab: Post-Install Tasks table

1.2.11 Oracle Fusion Applications Developer

The Oracle Fusion Applications developer is responsible for extending or customizing Oracle Fusion Applications pillars to meet specific enterprise business requirements. Typically, Oracle Fusion Applications are customized and extended after the provisioning the installation. However, it may be useful to participate in provisioning so as to establish continuity between the installation and customization.

1.2.12 Oracle Business Intelligence or Data Warehouse Reporting Specialist

If the organization's particular Oracle Fusion Applications deployment requires reporting and data warehouse capabilities, a reporting specialist has a primary role in the technical deployment. The expertise of the reporting specialist is mostly be required for the functional setup of the project, after reporting requirements have been determined and implemented.

The primary tasks of the reporting specialist are:

- Depending on the requirements of the organization, assisting in the technical deployment and functional setup
- Filling out the following tabs in the *Oracle Fusion Applications Installation Workbook*:
  - Databases tab: Oracle Fusion Applications Data Warehouse Database

1.2.13 Support Technician

The support technician is responsible to assist end users with any computing applications in the enterprise. The Oracle Fusion Applications deployment is usually one of many systems the support technician might cover.

Many organizations have technical and functional areas of specialization within the support technician role.

1.2.14 Oracle Fusion Applications Systems Integrator

Some organizations choose to hire Oracle Fusion Applications system integrators on a consulting basis who can fill gaps in technical expertise when necessary. Depending on the enterprise and the scope and scale of the deployment, an external Oracle Fusion Applications system integrator might be hired for a short or long period. Ideally, the systems integration consulting team is able to transfer substantial knowledge to support staff.

1.3 Prerequisites and Dependencies

The following prerequisites are needed before provisioning an Oracle Fusion Applications environment:

- Oracle Database
- Oracle Identity Management
- Oracle Business Intelligence

1.3.1 Oracle Database

A transaction database must have been installed and configured before installing product offerings. The Provisioning Wizard can be used to create an empty, single-instance database instance. This is a discrete and separate task from the other provisioning options. Alternatively, the database can be installed manually without using the wizard.

In either case, finish the database installation by running the Oracle Fusion Applications Repository Creation Utility (Applications RCU) to load applications and middleware content into the database. This process creates the applications and middleware schemas, loads seed data, and creates the tablespaces, as well all other required packages.

1.3.2 Oracle Business Intelligence

Oracle Business Intelligence is a portfolio of technology and applications comprising an integrated toolset (for querying, reporting, analysis, alerts, mobile analytics, data integration and management, and desktop integration), as well as financial performance management, applications, operational business intelligence applications, and data warehousing.

Typically, Oracle Business Intelligence products are integrated with, and accessible from, other operational applications, such as Oracle Fusion Applications. This integration provides business metrics in the context of an organization's business function and industry.

The Oracle Business Intelligence products integrated with Oracle Fusion Applications include:

- Oracle Business Intelligence Enterprise Edition (Oracle BI EE): A suite of business intelligence tools that delivers a full range of analytic and reporting capabilities.

  Oracle Business Intelligence Enterprise Edition is installed and provisioned as part of the Oracle Fusion Applications installation and provisioning process. The BI Provisioning step creates a WebLogic domain, the BI Web application (J2EE) components, and the BI Server and BI Presentation Services, which are deployed on the computer that hosts the domain. The resulting environment is referred to as the "Business Intelligence domain" or "BI Domain."

- Oracle Business Intelligence Applications: Uses Oracle Business Analytics Warehouse, a unified data repository for all customer-centric data that supports the analytical requirements of Oracle Business Intelligence Applications. Oracle Business Intelligence Applications supplies the warehouse database schema, as well as the logic that extracts data from the Oracle Fusion Applications transactional database and loads it to the warehouse.

  The Oracle Fusion Applications installation and provisioning process installs the Oracle BI Applications software components in the Business Intelligence Oracle Home but does no further setup. To finish setting up Oracle BI Applications, follow the instructions in Overview of Functional Configuration in Oracle BI Applications in the *Oracle Business Intelligence Applications Configuration Guide*.

- Oracle Transactional Business Intelligence: An ad hoc query and self-service reporting solution offered to all Oracle Fusion Applications customers. Paired with Oracle BI EE, it provides business users with an easy-to-use interface for performing current state analysis of their business applications. Constructed queries and reports are executed in real time against the transactional schema supported by a layer of view objects. This product is configured and deployed during provisioning.

- Oracle Essbase: An online analytical processing (OLAP) server that provides an environment for deploying prepackaged applications or developing custom analytic and enterprise performance management applications.

- Oracle Business Intelligence Publisher: An enterprise reporting solution for authoring, managing, and delivering reports from multiple data sources in multiple formats via multiple channels.

  For more information about reporting, see Managing Report Delivery Servers in the *Oracle Fusion Applications Administrator's Guide*.

- Oracle Real-Time Decisions: A platform that combines both rules and predictive analytics to apply real-time business intelligence at the point of contact. It optimizes all interactions with the customers by infusing analytical decisions into each transaction.

  For more information Oracle Real-Time Decisions, see About Oracle Real-Time Decisions Installation in the *Oracle Real-Time Decisions Installation and Administration Guide*.

1.3.3 Oracle Identity Management

Oracle Identity Management enables enterprises to manage the end-to-end life cycle of user identities across all enterprise resources — both within and beyond the firewall. An installation of Oracle Fusion Applications relies on Oracle Identity Management components to provide web Single Sign-on capability and to act as the policy, credential, and identity store. Although the majority of these components fall within the prerequisite environment, the resource WebGate that acts as the proxy for user authentication must be provisioned along with the applications.

The Oracle Identity Management components required to be present in an Oracle Fusion Applications environment are:

- Oracle Access Manager (OAM): Manages authentication and authentication policies, including Oracle Single Sign-On, security functions, user self-service, policy management, and delegated administration
- Oracle Internet Directory (OID): A general-purpose directory service that enables fast retrieval and centralized management of information about dispersed users and network resources

1.4 Features of Provisioning

Oracle Fusion Applications Provisioning is a full-featured process that provides all the tool to set up a repository of installers and installation-related processes, present product configurations that can be installed in an environment, provide a means to collect configuration details about those offerings, and run the installation phases necessary to perform configuration and deployment tasks.

1.4.1 Oracle Fusion Applications Provisioning Repository

The Oracle Fusion Applications software provides a repository of installers, each called silently when needed to perform application-specific tasks during the provisioning of the new environment. During the creation of the response file, indicate the location of the repository in the Provisioning Wizard interview.

The provisioning repository must be on a network drive that is visible to all hosts that are associated with the Oracle Fusion Applications environment. See Create the Oracle Fusion Applications Provisioning Repository (page 5-25).

1.4.2 Oracle Fusion Applications Provisioning Framework

The provisioning installer (`faprov`) creates the Oracle Fusion Applications Provisioning framework. It includes the following components:

- **Provisioning Wizard**: A question-and-answer interview that guides through the process of installing a database, creating or updating a response file, and installing or deinstalling the components of an Oracle Fusion Applications environment. The Provisioning Wizard can only be used on the database host to install a single instance database, or on the primordial host (refer to Types of Hosts in a Multiple-Host Environment (page 1-14)) for the other provisioning options such as creating a response file, updating a response file, provisioning an applications environment and deinstalling an applications environment.
- **Provisioning Command-Line Interface (CLI)**: Used for starting the provisioning wizard and running installation phases on the primary, secondary, and DMZ hosts (when present). Use also provisioning CLI on the primordial host for manual cleanup and restore, and for running provisioning phases as needed.
- **Provisioning-related files and utilities**: Repository of ANT utilities, binary files, library files, templates, locations of saved response files and provisioning build scripts, and other provisioning utilities required for performing provisioning tasks. Choose a location to install these utilities, for example, *framework_location*`/provisioning`.

See Install the Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks (page 6-1).

1.4.3 System Requirements

This release of Oracle Fusion Applications relies on supported platforms documentation for Oracle Fusion Applications (page 1-11) to supply certified versions of Oracle components. This documentation provides details about hardware and software, minimum disk space and memory requirements, required system libraries, packages, or patches, and minimum database requirements. Consult an Oracle Fusion Applications sizing-certified representative to obtain specific, customized system hardware requirements.

Please note that the self-signed certificate is set to three years when provisioning is complete.

1.4.3.1 Download Instructions

To download the Oracle Fusion Applications Release 12 Media Pack, use the UnZip / 7-Zip utility to extract the Oracle software to a preferred location (*REPOSITORY_LOCATION*). UnZip is a freeware tool that is available on the Info-ZIP website.

1.4.4 Supported Platforms

For information about the supported platforms for Oracle Fusion Applications, see the latest certification information published at My Oracle Support.

As the Oracle Fusion Applications Release 12 Media Pack is specific for a platform, Oracle Fusion Applications must be installed on the same platform. This includes the Oracle Database, Oracle Identity Management, and Oracle Fusion Applications.

1.4.5 Oracle Identity Management Provisioning Wizard

The Oracle Identity Management Provisioning Wizard steps through all Identity Management provisioning tasks. Using the wizard, create or update a response

file, configure the Identity Management environment, install an Identity Management database, and configure a load balancer.

The wizard allows to accomplish the following tasks.

- **Response File Creation**. Create a response file before provisioning the Identity Management environment. Use a pre-existing response file, if one exists, or create a new one. Response file information includes the name, version, creation date, and so on.
- **Install Location Configuration**. Specify the software repository and installation locations, as well as the shared configuration location.
- **Node Topology Configuration**. Select Identity Management node configuration options and provide information about hosts and products.
- **Virtual Hosts Configuration**. Configure virtual hosts for the Identity Management servers, as required for Oracle Fusion Applications.
- **Common Passwords**. Set the common password for all administrative Identity Management users and keystores.
- **Oracle Internet Directory Configuration**. Specify the distinguished name of the Oracle Internet Directory realm.
- **Oracle Directory Services Manager Configuration**. Select configuration options for Oracle Directory Services Manager (ODSM).
- **Oracle HTTP Server for Identity Management Configuration**. Change the installation ports used for Oracle HTTP Server (OHS).
- **Oracle Access Manager Configuration**. Use the OAM Configuration Page to select installation options for Oracle Access Manager.
- **Oracle Identity Management Database Configuration** Use the IDM DB Configuration Page to enter information about the Database that contains the schemas for Oracle Internet Directory and Oracle Access Manager.
- **Load Balancer Configuration**. Configure the load balancer for multiple host installations.

1.4.6 Oracle Fusion Applications Provisioning Wizard

The Provisioning Wizard steps through all provisioning-related tasks. Using the wizard, install a transaction database, create or update a response file, provision a new environment, and deinstall an applications environment.

- **Install an Applications Transaction Database**. Install a database to hold transactional data *before* creating a response file. Then, enter the database configuration values set up during the database installation in the response file. The provisioning process uses those values to connect the database to the new applications environment. Complete the process by running Oracle Fusion Applications RCU to create schemas and tablespaces, load seed data, and perform other database configuration tasks.
- **Create a New Applications Environment Response File**. A response file is a provisioning configuration file containing information about credentials, applications, and middleware hosts; used to install a new environment. Specify the location of this response file to provision the new environment. The wizard also allows to update an existing response file.

- **Update an Existing Response File**. Select this option to add or change the details in a partially completed response file or to update a completed response file that has not yet been used to provision an applications environment.
- **Provision an Oracle Fusion Applications Environment**. Select this option and specify the location of a response file as the first step in initiating the installation, configuration, and deployment of the product offerings. In a multiple host environment, the installation runs on each host individually, in phase order, using a combination of the provisioning wizard and command line interface.
- **Deinstall an Oracle Fusion Applications Environment**. Selecting this option removes all components installed to an existing Oracle Fusion Applications environment using the wizard. Run this process on all hosts. The wizard does *not* remove the database and LDAP.

1.4.7 Response File

With the Provisioning Wizard question-and-answer interview tool, specify one or more provisioning configurations and collect details associated with the product offerings in those configurations. These responses are the basis for creating a **response file**. This response file contains the structural outline of the applications environment topology that are being implemented. To provision the environment, specify the location of the response file and initiate the installation process.

The wizard interview questions fall into the following general areas:

- Global and contextual
- Database configuration and application dependency
- Shared middleware services

Global and Contextual Questions

These questions set the context and define the focus of the questions to be asked later in the interview. The approach is to progressively refine the scope of the questions, starting with the most generic and narrowing down to a specific path based on the selected provisioning configurations. For example, the **Installation Location** screen captures global information about the location of installation and configuration directories, and the **Database Configuration** screen records information about the transactional database.

Database Configuration and Application Dependency Questions

The interview is tied directly to the provisioning of one or more product configurations. With the product configuration chosen, the interview guides through the questions related to the product offerings and their dependencies. Dependencies include application and middleware products required by Oracle Fusion Applications, as well as details about the transaction database. For example, the **Domain Topology Configuration** screen collects information about the hosts where domains are to be deployed.

Shared Middleware Questions

At the conclusion of the application interview, move to interview questions about middleware services that are shared across domains, for example, the **Web Tier Configuration**, **Load Balancer Configuration**, **Web Proxy Configuration**, **Identity Management Configuration**, and **IDM Database Configuration** screens.

1.4.8 Provisioning Configurations

During the creation of a response file, select one or more offerings in any of the provisioning configurations listed in the wizard interview. During the actual provisioning process, all application and middleware products (components) associated with the selections are installed, configured, and deployed. However, only the Managed Servers for the product offerings that were selected are started.

Later, to start using an offering that was part of the initial provisioning configuration but has not yet been enabled, navigate to the Oracle Fusion Applications Setup Manager and start the Managed Servers for that offering.

For example, in the Oracle Fusion Customer Relationship Management configuration, there are two product offerings: Oracle Sales and Oracle Marketing. If only Oracle Sales is selected, the Managed Servers for that offering are started when the new environment is provisioned. To enable Oracle Marketing later, use the Oracle Fusion Applications Functional Setup Manager. There is no need to run provisioning a second time.

See Select Product Offerings (page 12-2) for more information about provisioning configurations.

1.5 Provision a Multiple Host Installation

Oracle Fusion Applications must be provisioned on multiple hosts for a production deployment and installed from a shared drive that is accessible to all hosts. To properly install all the necessary components for an applications environment on multiple hosts, run the physical installation in phases across all hosts.

1.5.1 Types of Hosts in a Multiple-Host Environment

The classification of hosts in a multiple-host environment determines the order in which the installation is run. The following types of hosts are available.

- **Primordial host**: Location of the common domain, specifically the administration server of the common domain. There is one primordial host in each provisioned environment where the administration server of the common domain will be.
- **Primary host**: Location of the administration server for a domain. Only one primary host exists in a domain.
- **Secondary host**: Location of the managed servers for any application when they are not on the same host as the administration server of the same domain. This term is typically used along with primary host to differentiate the physical hosts when a domain spans across them.
- **DMZ host**: A host that cannot access the shared storage behind the firewall is said to be in a demilitarized zone (DMZ). Typically used to install Oracle HTTP Server so as to enforce restrictions on communication with components behind the firewall.

For information about Oracle Fusion Applications environments, see Oracle Fusion Applications Topologies (page 2-13).

1.5.2 Installation Phases

Installation actions are completed in phases, across all hosts, in a prescribed phase order. Each phase must be completed on all hosts before running the next phase. For example, the preverify phase must be completed on hosts A, B, and C successfully before running the install phase on any other host. Any one phase can run simultaneously on multiple hosts. For example, run the install phase on hosts A, B, and C simultaneously. Oracle recommends to start the installation on the primordial host.

The provisioning installation phases are as follows (listed in phase order). See Installation Phases and Types of Hosts in a Multiple-Host Environment (page 13-2) for complete details.

- **Preverify**: Checks to see that the prerequisites for an installation are met.
- **Install**: Installs middleware and applications components and applies database patches shipped with provisioning (for databases created with the wizard).
- **Preconfigure**: Updates the Oracle Application Development Framework (Oracle ADF) configuration.
- **Configure**: Creates domains, Managed Servers, and clusters. Configures data sources and performs Node Manager registration of servers on the primordial and primary hosts.
- **Configure-secondary**: Performs the configuration actions on a primary or secondary host (or both), registers Managed Servers with the Node Manager on secondary hosts, and creates a web tier instance. If there are no primary or secondary hosts, or if there are only primary hosts, this phase runs, but takes no action.
- **Post-Configure**: Configures Oracle SOA Suite composite deployment and Oracle HTTP Server, and populates policies and grants. Configures middleware and applications that require servers to be online.
- **Startup**: Starts the Administration Server and Managed Servers on the current host. Performs online configuration, including global unique identifier (GUID) reconciliation and Financial/IPM configuration.
- **Validate**: Validates the deployment configuration and starts the Managed Servers.

1.6 Plan for Provisioning

Before creating a response file for the new Oracle Fusion Applications environment, decide what the topology should look like, including what product offerings to install, port allocations, and the type and number of hosts that are configure in the domains created for the product offerings. For example, Oracle recommends to choose a separate host for each domain that is installed. However, even in that scenario, some large product configurations must be split across multiple hosts.

Determine the necessary system requirements to complete the provisioning of a new environment, based on how the environment is used. For example, if a single instance database is being installed for use as a test system, the requirements differ from the installation of a multi-instance database to use for the production environment. Determine also the access privileges for the database administrator (DBA) or system administrator who performs the provisioning tasks.

Supply directory locations, user names, and passwords associated with the prerequisite installations of Oracle Database and Oracle Identity Management components. These installations must be completed before creating a response file.

1.7 Next Steps

Following is an overview of the Oracle Fusion Applications provisioning process flow.

Table 1-1 Provisioning Process Flow

Task	Description	Link
Planning	This section describes how to plan the topology and provisioning of an installation, and the configuration of the components of the installation: storage, network, databases, and Oracle Identity Management.	Plan the Topology and Provisioning of the Installation (page 3-1)
Preparing for provisioning	This section describes the components required to prepare for provisioning, including storage, servers, the network, and the provisioning repository; and how to install the Oracle Fusion Applications and Oracle Identity Management provisioning frameworks.	Prepare for an Installation (page 5-1)
Installing databases	This section explains how to install and troubleshoot databases for Oracle Identity Management database, the Oracle Fusion Applications transactional databases, and the Oracle Fusion Applications repository.	Install Database for Oracle Identity Management (page 7-1)
Provisioning Oracle Identity Management	This section describes how to provision and troubleshoot Oracle Identity Management for basic and enterprise topologies.	Oracle Identity Management Provisioning (page 10-1)
Provisioning Oracle Fusion Applications	This section describes how to use the Provisioning Wizard to create a response file, install the provisioning framework, and provision and troubleshoot Oracle Fusion Applications.	Create a Response File for a New Oracle Fusion Applications Environment (page 12-1)
Completing Post-Installation tasks	After provisioning the Oracle Fusion Applications installation, configure the installed components to suit the business and functional requirements. This part describes the post-installation tasks, both optional and required.	Complete Mandatory Post-Installation Tasks (page 15-1)
Incremental Provisioning	Incremental provisioning gives the flexibility to add product offerings, either newly introduced in the current release, or existing ones from prior release that have not been already provisioned, using the same Provisioning Wizard interview process.	Extend an Oracle Fusion Applications Environment Using Incremental Provisioning During Upgrade (page 27-1)

Table 1-1 (Cont.) Provisioning Process Flow

Task	Description	Link
Uninstalling	This section explains how to uninstall Oracle Fusion Applications, clean up after uninstalling, deleting the database, and uninstalling the Oracle Fusion Applications Provisioning Framework.	Uninstall an Oracle Fusion Applications Environment (page 28-1)

The next section explains in detail what the provisioned Oracle Fusion Applications environment looks like. It covers topics such as sample topologies, directory structures, and the products to be installed.

2

Understand What the Oracle Fusion Applications Environment Looks Like

This section describes the topology, directory structure, and installed products and components of Oracle Fusion Applications.
It includes the following topics:

- Introduction to What the Oracle Fusion Applications Environment Looks Like (page 2-1)
- Oracle Fusion Applications Topologies (page 2-13)
- Oracle Fusion Applications Directory Structure (page 2-24)
- Oracle Fusion Applications Runtime Processes (page 2-37)
- Access Oracle Fusion Applications (page 2-40)
- What to Do Next (page 2-40)

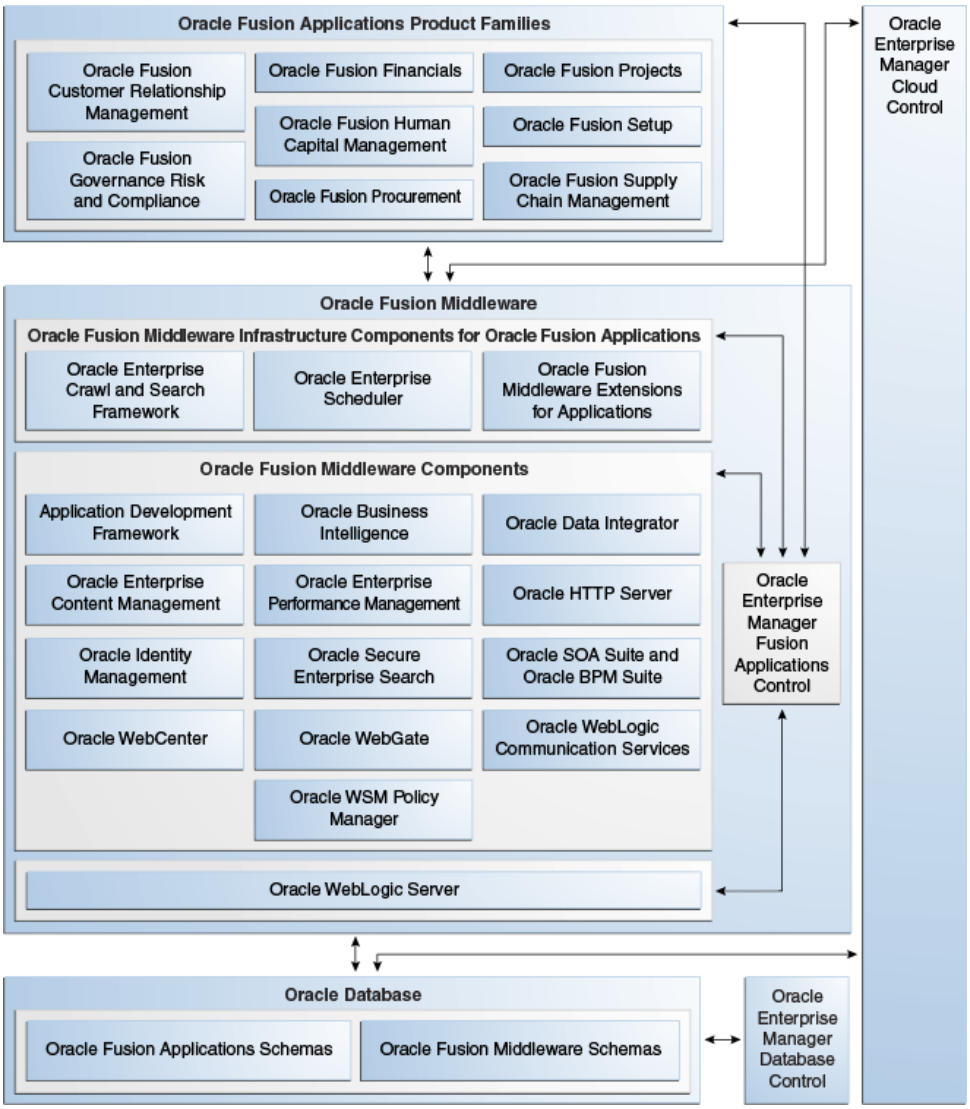
2.1 Introduction to What the Oracle Fusion Applications Environment Looks Like

Once fully installed, the Oracle Fusion Applications environment contains several Oracle as well as third party products which make up its technology stack. Oracle Fusion Applications is built on the Oracle Fusion Middleware stack and uses Oracle Database.

Understanding what the environment looks like after the installation process is complete helps to better understand the installation process, and plan for the installation so as to fit the desired environment configuration.

The Oracle Fusion Applications architecture is depicted in the following diagram.

Figure 2-1 Oracle Fusion Applications Architecture



2.1.1 Oracle Fusion Applications Product Families and Product Offerings

An installation of Oracle Fusion Applications is logically broken up into groups of features. Each set of features is known as **product offerings**, which represent the highest-level collection of functionality that can be licensed and implemented. A **product family** is a collection of one or more product offerings. During installation, select a product offering or a combination of offerings as a way to install the Oracle Fusion Applications products to be used.

Product families are dependent on companion applications—for example, Oracle Fusion Human Capital Management relies on Oracle Fusion Financials payroll—and Oracle Fusion Middleware components such as Oracle SOA Suite. The wizard allows for application and middleware configuration at the domain level during domain topology configuration.

When selecting particular product offerings within a configuration rather than all of them, the wizard starts the managed servers only for the selected offerings. However, because the dependency details for the entire configuration are included in the response file, additional functionality can be activated later using Oracle Fusion Applications Functional Setup Manager to start the other managed servers.

Oracle Fusion Applications includes the product families and product offerings described in the following table.

Table 2-1 Product Offerings

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offerings	Description
Oracle Fusion Customer Relationship Management	• Sales • Marketing • Customer Data Hub • Enterprise Contracts	Manages customers, contracts, and resources, including data quality configuration.
Oracle Fusion Financials	• Financials • Accounting Hub	Manages financial flows, including assets, ledgers, cash cycle, invoices and payments, accounts receivable, collections, and setup of subledger accounting and tax configuration.
Oracle Fusion Governance, Risk, and Compliance (**Not** installed by Oracle Fusion Applications.)	This product family is not installed by Oracle Fusion Applications. Download the software from Oracle Software Delivery Cloud and install it separately.	Provides critical business controls to manage risk, multi-regulatory compliance, and controls enforcement. The connector for Oracle Fusion Applications provides a prebuilt solution for managing Separation of Duties (SoD) within and across product families. Use also Oracle Fusion Governance, Risk, and Compliance to analyze suspect transactions and configuration settings based on user defined conditions. This allows organizations to actively determine the risk that exists within their application that can materially impact the reliability of the information that exists for reporting and decision making purposes. Finally, Oracle Fusion Governance, Risk, and Compliance can apply preventive controls that will limit what a user can see and do within an Oracle Fusion Applications user interface according to user-defined conditions. The objective is to pro-actively mitigate the risk of extraneous access or improper transactions from existing.
Oracle Fusion Human Capital Management	• Compensation Management • Workforce Development • Workforce Development	Provides employee management for an organization.

Table 2-1 (Cont.) Product Offerings

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offerings	Description
Oracle Fusion Procurement	Procurement	Manages the procurement process including requisitions, purchase orders, and supplier negotiations.
Oracle Fusion Project Portfolio Management	Projects	Manages projects, including how to plan, budget, forecast, collect costs, bill customers, and report performance.
Oracle Fusion Supply Chain Management	• Product Management • Order Orchestration • Manufacturing and Supply Chain Material Management • Price Management • Value Chain Planning • Material Management and Logistics • Supply Chain Financial Orchestration	Integrates and automates all key supply chain processes, from design, planning and procurement to manufacturing and fulfillment, providing a complete solution set to enable companies to power information-driven value chains.
Oracle Fusion Setup	This product family is installed along with all product offerings.	Supports the other product families. In addition to Oracle Fusion Functional Setup Manager for setting up functional data, this product family includes applications to assist application users: • The Oracle Fusion Home page provides a Welcome dashboard with a collection of portlets and task flows for answering common questions. • Oracle Fusion Applications Help delivers content users need to complete their tasks. Optionally, install a local version of Oracle Fusion Applications Help, enabling to extend and customize the help.

Table 2-2 Product Offering and Dependent Weblogic Server Domains

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offering	Provisioned Weblogic Server Domains (Primary + Dependent Domains)
Oracle Fusion Customer Relationship Management	Customer Data Management	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management

Table 2-2 (Cont.) Product Offering and Dependent Weblogic Server Domains

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offering	Provisioned Weblogic Server Domains (Primary + Dependent Domains)
Oracle Fusion Customer Relationship Management	Enterprise Contracts	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management
Oracle Fusion Customer Relationship Management	Marketing	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Customer Relationship Management	Sales	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Incentive Compensation	Incentive Compensation	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Incentive Compensation
Oracle Fusion Financials	Financials	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Project Portfolio Management, Oracle Fusion Supply Chain Management
Oracle Fusion Financials	Fusion Accounting Hub	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management

Table 2-2 (Cont.) Product Offering and Dependent Weblogic Server Domains

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offering	Provisioned Weblogic Server Domains (Primary + Dependent Domains)
Oracle Fusion Human Capital Management	Compensation Management	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management
Oracle Fusion Human Capital Management	Workforce Deployment	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management
Oracle Fusion Human Capital Management	Workforce Development	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management
Oracle Fusion Procurement	Procurement	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Project Portfolio Management, Oracle Fusion Supply Chain Management
Oracle Fusion Project Portfolio Management	Projects	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Procurement, Oracle Fusion Project Portfolio Management, Oracle Fusion Supply Chain Management
Oracle Fusion Supply Chain Management	Materials Management and Logistics	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management

Table 2-2 (Cont.) Product Offering and Dependent Weblogic Server Domains

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offering	Provisioned Weblogic Server Domains (Primary + Dependent Domains)
Oracle Fusion Supply Chain Management	Order Orchestration	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Supply Chain Management	Product Management	Oracle Business Intelligence, Common, Oracle Identity Management,Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Supply Chain Management	Supply Chain Financial Orchestration	Oracle Business Intelligence, Common Oracle Identity Management, Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Supply Chain Management	Manufacturing and Supply Chain Material Management	Oracle Business Intelligence, Common Oracle Identity Management, Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management
Oracle Fusion Supply Chain Management	Price Management	Oracle Business Intelligence, Common Oracle Identity Management, Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management

Table 2-2 (Cont.) Product Offering and Dependent Weblogic Server Domains

Oracle Fusion Applications Product Families	Oracle Fusion Applications Product Offering	Provisioned Weblogic Server Domains (Primary + Dependent Domains)
Oracle Fusion Supply Chain Management	Value Chain Planning	Oracle Business Intelligence, Common, Oracle Identity Management, Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Supply Chain Management

2.1.2 New Product Offerings, Applications, Oracle WebLogic Server Managed Servers, and Clusters for Release 12

The following new product offerings, applications, Oracle WebLogic Server Managed Servers, and clusters were added in this release.

Component	On Premise	SaaS	Comments
Product Offering	NA	Student Management	Available for SaaS
Product Offering	NA	Recruiting and Candidate Experience	Available for SaaS
Domain	NA	HigherEd (HED)	Available for SaaS
Applications	NA	(HED) Campus Community	Available for SaaS
Applications	NA	(HED) Financials Management	Available for SaaS
Applications	NA	(HED) Records Management	Available for SaaS
Applications	NA	(HED) Ess	Available for SaaS
Applications	NA	(HED) SOA	Available for SaaS
Applications	Applications Core Ess	Applications Core Ess	Available for on premise and SaaS
Applications	NA	Learn	Available for SaaS
Applications	NA	Recruiting and Candidate Experience	Available for SaaS
Applications	NA	HCM Sem Search	Available for SaaS
Managed Server / Cluster	NA	(HED) Campus Community	Available for SaaS
Managed Server / Cluster	NA	(HED) Campus Community	Available for SaaS
Managed Server / Cluster	NA	(HED) Records Management	Available for SaaS

Component	On Premise	SaaS	Comments
Managed Server / Cluster	NA	(HED) Ess	Available for SaaS
Managed Server / Cluster	NA	(HED) SOA	Available for SaaS
Managed Server / Cluster	NA	Recruiting	Available for SaaS
Managed Server / Cluster	NA	Hcm Sem Search	Available for SaaS

2.1.3 Oracle Fusion Middleware Infrastructure Components

The product families use the following common core framework and infrastructure for Oracle Fusion Applications described in the following table.

Table 2-3 Oracle Fusion Middleware Infrastructure Components

Oracle Fusion Middleware Infrastructure Component	Description
Oracle Fusion Middleware Extensions for Applications (Applications Core)	Provides design time and runtime infrastructure to help standardize complex development patterns for Oracle Fusion Applications. It simplifies the development process of these patterns and provides a consistent user experience. Examples of these patterns include extensibility (Flexfields), hierarchical relationships (Trees), data security, and UI patterns. Applications Core creates simplified methods of implementing these complex requirements by providing robust metadata and comprehensive UI components and services. All of the Applications Core components have been intricately integrated with the rest of the Oracle Fusion Middleware infrastructure so they are available across every layer of the Oracle Fusion Applications platform. Applications Core provides shared libraries referenced by all the Oracle Fusion Applications, a standalone application for application setup and configuration, an Oracle JDeveloper extension to seamlessly integrate our components with the rest of the Oracle Fusion Applications technology stack, PLSQL APIs, C libraries, and common seed data.
Oracle Enterprise Scheduler	Enables to manage and schedule jobs for Oracle Fusion Applications.
Oracle Enterprise Crawl and Search Framework (ECSF)	Oracle Enterprise Crawl and Search Framework (ECSF) enables Oracle Fusion Applications Search for performing full-text searches securely and simultaneously against multiple logical business objects. Any application that connects to multiple data sources or manages a significant amount of unstructured (non-database) information—or both—needs advanced search capabilities so that application users can easily locate and take action on data that is relevant to them.

2.1.4 Oracle Fusion Middleware Components

A complete installation of Oracle Fusion Applications includes several Oracle and third party products. The majority of installed products form the core of the Oracle

Fusion Applications environment, and are installed regardless of the offerings selected during provisioning. Some products are installed only when selecting particular product offerings, while others must be installed manually following provisioning.

Oracle Fusion Middleware includes the components described in the following table.

Except where otherwise stated, all products are installed during Oracle Fusion Applications provisioning and are enabled by default.

MANDATORY: Install Oracle Database Server before running Oracle Fusion Applications provisioning.

MANDATORY: Before running the Oracle Identity Management Provisioning Wizard, install Oracle Java HotSpot and Oracle Database Server and run the Oracle Fusion Middleware RCU.

Table 2-4 Oracle Fusion Middleware Components

Oracle Fusion Middleware Components	Description
Oracle Access Manager	Provides the core functionality of Web Single Sign On (SSO), authentication, authorization, centralized policy administration and agent management, real-time session management, and auditing. Installed by Oracle Identity Management provisioning.
Oracle Application Development Framework	Provides an end-to-end application framework that builds on Java Platform, Enterprise Edition (Java EE) standards and open-source technologies to simplify and accelerate implementing service-oriented applications.
Oracle BI Enterprise Edition and Oracle Business Intelligence Applications	Oracle Business Intelligence provides a complete, integrated solution of analytics and reporting for Oracle Fusion Applications. Oracle Business Intelligence Applications is installed **manually** post-provisioning, and is **not** enabled by default. The Oracle Fusion Applications installation and provisioning process installs the Oracle BI Applications software components in the Business Intelligence Oracle home but does no further setup. To finish setting up Oracle BI Applications, follow the instructions in Installing and Setting Up Oracle Business Intelligence Applications in the *Oracle Business Intelligence Applications Installation Guide*.
Oracle Database Server and Client	The Oracle Database contains the schemas and tablespaces required for both the Oracle Fusion Applications and for the applications. Oracle Fusion Applications does not support other databases. Oracle Database Server must be installed before running Oracle Fusion Applications provisioning and Oracle Identity Management provisioning.
Oracle Data Integrator	Oracle Data Integrator provides a comprehensive data integration platform that covers bulk data movement requirements for Oracle Fusion Applications.
Oracle Directory Services Manager	Provides a graphical administrative interface for Oracle Internet Directory. Installed by Oracle Identity Management provisioning.

Table 2-4 (Cont.) Oracle Fusion Middleware Components

Oracle Fusion Middleware Components	Description
Oracle Global Order Promising	A comprehensive order promising solution that determines, based on the current and projected demands and supplies across a supply chain and on an extended supply chain, when a customer order can be fulfilled. This is installed only when selecting Oracle Supply Chain Management.
Oracle HTTP Server	Provides a web listener for applications and the framework for hosting static and dynamic pages and applications over the web. Based on the proven technology of the Apache HTTP Server, Oracle HTTP Server includes significant enhancements that facilitate load balancing, administration, and configuration. Installed by Oracle Identity Management provisioning.
Oracle Internet Directory	A general-purpose LDAPv3 compliant directory storage, Oracle Internet Directory serves as the central user repository for Oracle Identity Management. Installed by Oracle Identity Management provisioning.
Oracle Java HotSpot	Oracle Java HotSpot is installed by Oracle Fusion Applications provisioning. Oracle Java HotSpot JDK must be installed prior to running Oracle Identity Management provisioning.
Oracle Secure Enterprise Search	Provides a search engine for Oracle Fusion Applications Search.
Oracle WebCenter Content	Provides a comprehensive suite of digital content management tools. These tools can be used across the enterprise to cohesively track, manage, and dispose of content whether written, in digital images, or as email.
Oracle WebCenter Portal	Enables to create social applications, enterprise portals, collaborative communities, and composite applications, built on a standards-based, service-oriented architecture. Oracle WebCenter Portal combines dynamic user interface technologies with which to develop rich internet applications, the flexibility and power of an integrated, multichannel portal framework, and a set of horizontal Enterprise 2.0 capabilities delivered as services that provide content, collaboration, presence, and social networking capabilities. Based on these components, Oracle WebCenter Portal also provides an out-of-the-box, enterprise-ready customizable application, WebCenter Spaces, with a configurable work environment that enables individuals and groups to work and collaborate more effectively.
WebGate for Oracle Access Manager	Acts as a communicator plug-in that accepts users requests through Oracle HTTP Server and communicates with Oracle Access Manager. Installed by Oracle Identity Management provisioning.
Oracle WebLogic Communication Services	Provides click-to-dial functionality for applications primarily through contextual actions. Contextual actions provide related information and actions to users within the immediate context of the object instances upon which they act.

Table 2-4 (Cont.) Oracle Fusion Middleware Components

Oracle Fusion Middleware Components	Description
Oracle WebLogic Server	Supports the deployment of mission-critical applications in a robust, secure, highly available, and scalable environment. Oracle WebLogic Server is an ideal foundation for building applications based on service-oriented architecture (SOA). Installed by Oracle Identity Management provisioning.
Oracle Web Tier	Includes components that interact with end users at the outermost tier of application grid infrastructure, typically through HTTP requests and responses. Hosts web pages and provides security and high performance along with built-in clustering, load balancing, and failover features

2.1.4.1 Products Installed to the Desktop

In addition to the server-side products installed by the provisioning tools, Oracle Fusion Applications uses the following products that are installed on the desktop.

- Oracle BI Enterprise Edition plus client
- Oracle Data Integrator Studio
- Oracle JDeveloper

2.1.4.2 Other Related Products

The following Oracle and third-party products are sometimes used to interact directly with Oracle Fusion Applications.

- **Microsoft Active Directory**: Used to integrate with Oracle Identity Management to provide identity information to Oracle Fusion Applications.
- **Other Applications**: Additional applications such as Oracle eBusiness Suite, Oracle PeopleSoft Human Capital Management, and Oracle Siebel Customer Relationship Management can be configured to integrate with Oracle Fusion Applications.

2.1.5 Oracle Database

The Oracle Database contains the schemas and tablespaces required for both the Oracle Fusion Applications and for the applications. Oracle Fusion Applications does not support other databases.

Oracle Fusion Applications encryption APIs mask data such as credit card numbers in application user interface fields. For encryption and masking beyond that, Transparent Data Encryption (TDE) and Oracle Database Vault (ODV) are certified but optional with Oracle Fusion Applications.TDE and ODV provide information life cycle protections, such as the following:

- Data access restrictions on database administrators and other privileged users
- Sensitive data at rest in database files and file backups
- Sensitive data in transit

- Sensitive attributes in non-production databases

ODV establishes limitations on the power of privileged users to access sensitive data through segregation of duties policies on DBA roles and by securely consolidating application data in the database. These limitations prevent DBAs and other privileged users from overriding the protections placed on sensitive data by the Virtual Private Database (VPD). Oracle Fusion Applications deploys with the ODV enabled when it is installed. TDE prevents access to personally identifiable information in the file system or on backups or disk. TDE protects confidential data, such as credit card and social security numbers. TDE encrypts sensitive table data stored in data files at the tablespace level.

2.1.6 Oracle Fusion Applications Management Tools

The primary administrative management tool for Oracle Fusion Applications is Enterprise Manager Cloud Control. It provides an integrated interface to manage the entire environment. For information about Enterprise Manager Cloud Contol, see Get Started with Enterprise Manager Cloud Control in the *Oracle Fusion Applications Administrator's Guide*.

A collection of native tools, including Oracle Enterprise Manager Fusion Applications Control and WebLogic Server Control, still exist in the environment. Information about accessing them can be found in Use Other Oracle Fusion Applications Administration Tools in the *Oracle Fusion Applications Administrator's Guide*.

2.2 Oracle Fusion Applications Topologies

Both Oracle Identity Management and Oracle Fusion Applications provisioning offer several topology options which allow to tailor the Oracle Fusion Applications environment, including server allocation, networking, and availability.

There are numerous possible topological permutations, but most topologies fall into a few categories with small variations (such as the use of a demilitarized zone, shared servers, or reverse proxy). These categories are:

- **Basic topology**. This is the simplest type of topology possible directly out-of-the-box.
- **Enterprise topology**. This type of topology is ideal for testing environments where high availability is not necessary.
- **Enterprise topology with high availability**. This type of topology is ideal for Oracle Fusion Applications production environments.

The diagrams in each topology example show logical units, rather than individual servers, representing components of the Oracle Fusion Applications installation. Each unit can be installed to its own server, or multiple units can share a single server, depending on the needs of your enterprise.

2.2.1 Topology Tiers

The Oracle Fusion Applications topologies use a tier-based model that is logically grouped into three tiers: the database tier, middle tier (split into directory and application tiers in Oracle Identity Management), and web tier.

This tier-based model is useful when mapping the Oracle Fusion Applications topology to the type of environment created, fitting the topology to the corporate network location policies, and, consequently, determining where the components should reside in the network.

For example:

- The company may have a firewall-protected subnet reserved for all production databases. Typically, this is where the databases are deployed, and the database tier resides.
- The company may have a demilitarized zone (DMZ) where all externally-accessible web servers reside. Typically, this is where the web tier resides, and the web tier components such as the Oracle HTTP Servers and Webgate for Oracle Access Manager are deployed.
- The company may have a policy that specifies that application-specific HTTP servers may not reside in the DMZ. In such cases, the web tier should be deployed to the internal network along with the mid tier, with a reverse proxy in the DMZ that forwards all external requests to the web tier in the internal network.

Topology tiers are also related to high availability requirements. For a highly available Oracle Fusion Applications environment, each tier must be handled and scaled out independently.

2.2.1.1 Database Tier

In an Oracle Fusion Applications environment, the database tier includes all the databases used for both Oracle Fusion Applications and Oracle Identity Management. For more information about the databases that are part of the Oracle Fusion Applications environment, see Database Instances and Other Processes (page 2-38).

2.2.1.2 Middle Tier

The middle tier includes all the components between the database tier and the web tier. Components in the middle tier include Oracle WebLogic Servers and the applications deployed on the servers, among other things.

Middle tier components are not accessible directly by end users. Access to the applications in the middle tier is achieved through the web tier, which is ideal for environments where complete isolation between end users and the application is required.

The middle tier consumes information provided from all other tiers as well as itself:

1. The middle tier accesses data stored in any of the Oracle Fusion Applications or Oracle Identity Management databases on the database tier via JDBC or SQL*Net.
2. The middle tier directly accesses the Oracle Identity Management directory tier via LDAP for identity, policy, and credential data.
3. Certain middle tier applications and components communicate amongst themselves using direct calls via protocols such as T3, HTTP, and TCP sockets.
4. For HTTP requests, certain middle tier applications and components communicate amongst each other through calls to the web tier, which then forwards the request to other components in the middle tier.

For Oracle Identity Management, the middle tier is split into two tiers: the directory tier and application tier.

2.2.1.2.1 Oracle Identity Management Directory Tier

The Oracle Identity Management directory tier is the deployment tier where all the LDAP services reside. This tier includes products such as Oracle Internet Directory. The directory tier is managed by directory administrators providing enterprise LDAP service support.

The Directory Tier stores identity information, which contains information about users and groups.

Although the topology diagrams do not show LDAP directories other than Oracle Internet Directory, use Microsoft Active Directory to store identity information. However, always store policy information in Oracle Internet Directory. Store identity information in Oracle Internet Directory or another directory.

2.2.1.2.2 Oracle Identity Management Application Tier

The Oracle Identity Management application tier is the place where Oracle Identity Management Java EE applications are deployed. The main Java EE components deployed to this tier include Oracle Directory Services Manager and Oracle Enterprise Manager Fusion Middleware Control.

The Oracle Identity Management applications on the application tier interact with the directory tier for enterprise identity information and, in some cases, for application metadata. Oracle Enterprise Manager Fusion Middleware Control and Oracle Directory Services Manager provide allow to manage and administer the components in the application and directory tiers.

2.2.1.3 Web Tier

The web tier contains the Oracle HTTP Servers as well as Webgate for Oracle Access Manager. It is the only tier that can be accessed by end users in Oracle Fusion Applications, and forwards end-user HTTP requests to the applications and components running in the middle tier.

In Oracle Fusion Applications, the web tier can have a load balancer or reverse proxy as a front end. The load balancer or reverse proxy handle all HTTP requests meant for the web tier.

The web tier can be placed in the DMZ if desired, providing end-user access to the services from the middle tier on that side of the firewall.

2.2.2 Network Components

The enterprise and enterprise with high availability topologies involve the use of a load balancer or reverse proxy.

- **Reverse proxy**: The reverse proxy stands between the Oracle Fusion Applications web tier and HTTP clients (end users and external applications). The main purpose of a reverse proxy is to act as a gateway to Oracle Fusion Applications, particularly for network configurations in which clients are using a different subnet from Oracle Fusion Applications. Reverse proxies are recommended for environments using the enterprise topology.

- **Load balancer**: The load balancer is the intermediary between the Oracle Fusion Applications environment and both internal and external clients, where internal clients are Oracle Fusion Applications components and external applications include end users and external applications. The load balancer distributes HTTP requests among servers in the web tier, and TCP requests among the LDAP servers hosting the identity store, policy store, and Oracle Universal Content Management. The load balancer also acts as a gateway for external clients to the Oracle Fusion Applications environment, much like the reverse proxy.

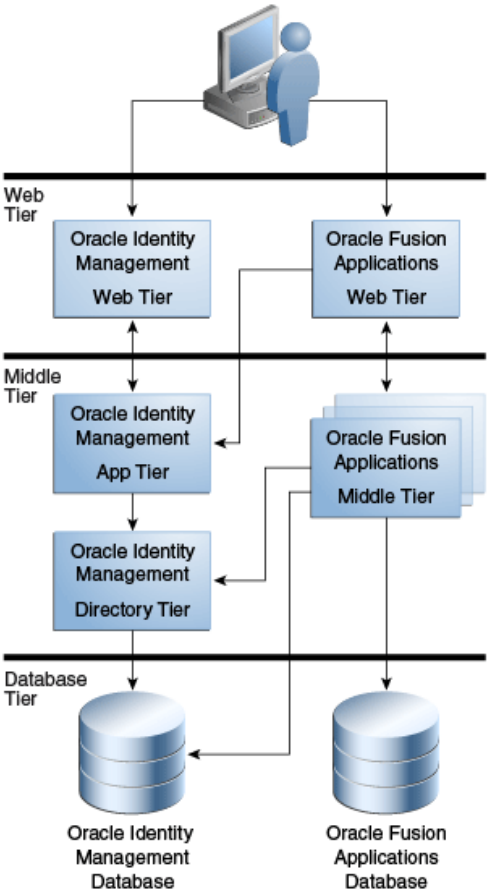
From the perspective of provisioning, the configuration for a load balancer or reverse proxy is essentially the same. The following table summarizes the differences between using a reverse proxy and a load balancer in the context of Oracle Fusion Applications.

Table 2-5 Load Balancer or Reverse Proxy

Functionality	Load Balancer	Reverse Proxy
Acts as an HTTP gateway to Oracle Fusion Applications.	Yes	Yes
Provides high availability through load balancing.	Yes	No
Used for external HTTP traffic.	Yes	Yes
Used for internal HTTP traffic.	Yes	Yes or no
Used for LDAP traffic.	Yes	No
Used for TCP traffic to Oracle WebCenter Content (UCM).	Yes	No

2.2.3 Basic Topology

Figure 2-2 Oracle Fusion Applications Basic Topology



The basic topology is the most rudimentary of possible Oracle Fusion Applications environments, making it a good choice for development or demonstration or proof of concept purposes. It is also the easiest to install, with minimal hardware requirements. In fact, all the components can be installed to the same server, given sufficiently robust hardware. Alternatively, Oracle Fusion Applications domains can be installed to more than one machine so as to better support Oracle Fusion Applications memory requirements. No additional network components are required as all communication is server-to-server.

The features of an Oracle Fusion Applications environment with a basic topology are shown in the following table.

Table 2-6 Features of the Basic Topology

Feature	Used in Topology?
Nodes	2 or more

Table 2-6 (Cont.) Features of the Basic Topology

Feature	Used in Topology?
Oracle Identity Management and Oracle Fusion Applications shared node for middle and web tiers	Yes
Oracle Identity Management and Oracle Fusion Applications web tier DMZ setup	No
Reverse proxy or load balancer	No
High availability	No
Expandable post-installation	Limited

Sample configurations of the basic topology are shown in the following table. The following notation is used in the table:

- Oracle Fusion Applications: FA
- Oracle Identity Management: IDM
- Oracle Fusion Applications Database: FA DB
- Oracle Identity Management Database: IDM DB

The asterisk (*) following FA indicates that Oracle Fusion Applications can be split among multiple nodes.

MANDATORY: Install Oracle Identity Management Middle Tier and Oracle Fusion Applications Middle Tier on different hosts. Installing Oracle Identity Management and Oracle Fusion Applications on the same host is not a supported topology.

MANDATORY: Do not share the same database instance for Oracle Identity Management and Oracle Fusion Applications.

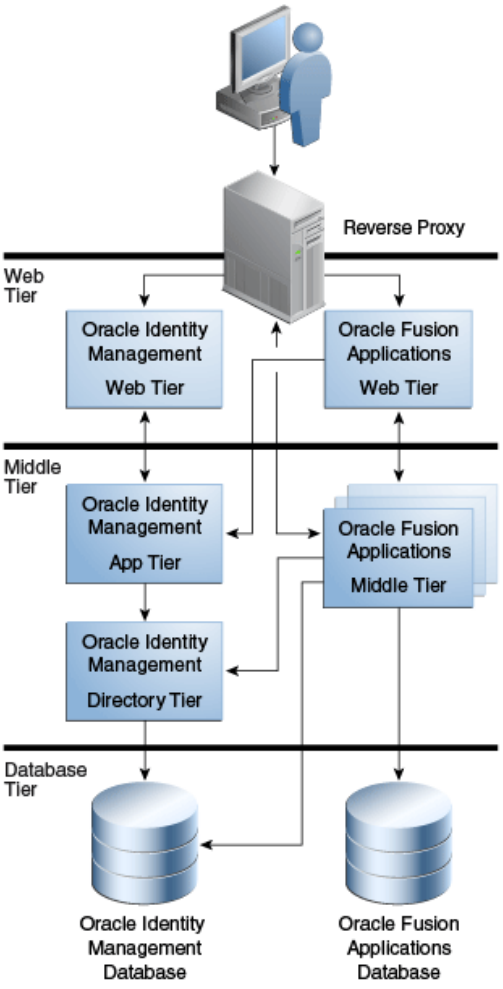
MANDATORY: The database instances must also be running on physical host(s).

Table 2-7 Sample Configurations of the Basic Topology

Number of Nodes	Components per Node	Sample Host Names
2	• **Node 1**: FA*, FA DB • **Node 2**: IDM, IDM DB	fahostN.mycompany.com idmhost.mycompany.com
3	• **Node 1**: FA* • **Node 2**: IDM • **Node 3**: FA DB, IDM DB	fahostN.mycompany.com idmhost.mycompany.com dbhost.mycompany.com
3	• **Node 1**: FA* • **Node 2**: FA DB • **Node 3**: IDM, IDM DB	fahostN.mycompany.com fadbhost.mycompany.com idmhost.mycompany.com
4	• **Node 1**: FA* • **Node 2**: FADB • **Node 3**: IDM • **Node 4**: IDMDB	fahostN.mycompany.com fadbhost.mycompany.com idmhost.mycompany.com Idmdbhost.mycompany.com

2.2.4 Enterprise Topology

Figure 2-3 Oracle Fusion Applications Enterprise Topology



The enterprise topology is the most flexible of Oracle Fusion Applications environments, in that it can be expanded following installation. This topology is useful for testing environments in which high availability is not required. The topology features a clear differentiation amongst the web, application, and data tiers. Install Oracle Fusion Applications domains to more than one machine so as to better support memory requirements. The Oracle Identity Management middle tier can be installed to a maximum of two nodes using the Oracle Identity Management Provisioning Wizard, but additional nodes can be added manually post-install. The use of a reverse proxy is recommended for greater flexibility.

The features of an enterprise topology Oracle Fusion Applications environment are shown in the following table.

Table 2-8 Features of the Enterprise Topology

Feature	Used in Topology?
Nodes	4 or more
Oracle Identity Management and Oracle Fusion Applications shared node for middle and web tiers	No
Oracle Identity Management and Oracle Fusion Applications web tier DMZ setup	Optional
Reverse proxy or load balancer	Recommended
High availability	No
Expandable post-installation	Yes

Sample configurations of the enterprise topology are shown in the following table. The following notation is used in the table:

- Oracle Fusion Applications: FA Web
- Oracle Fusion Applications Middle Tier: FA Mid
- Oracle Identity Management: IDM Mid
- Oracle Identity Management Web Tier: IDM Web
- Oracle Fusion Applications Database: FA DB
- Oracle Identity Management Database: IDM DB

The asterisk (*) following FA Mid indicates that the Oracle Fusion Applications middle tier can be split among multiple nodes. The asterisk (*) following IDM Mid indicates that the Oracle Identity Management middle tier can be split amongst two nodes.

Table 2-9 Sample Configurations of the Enterprise Topology

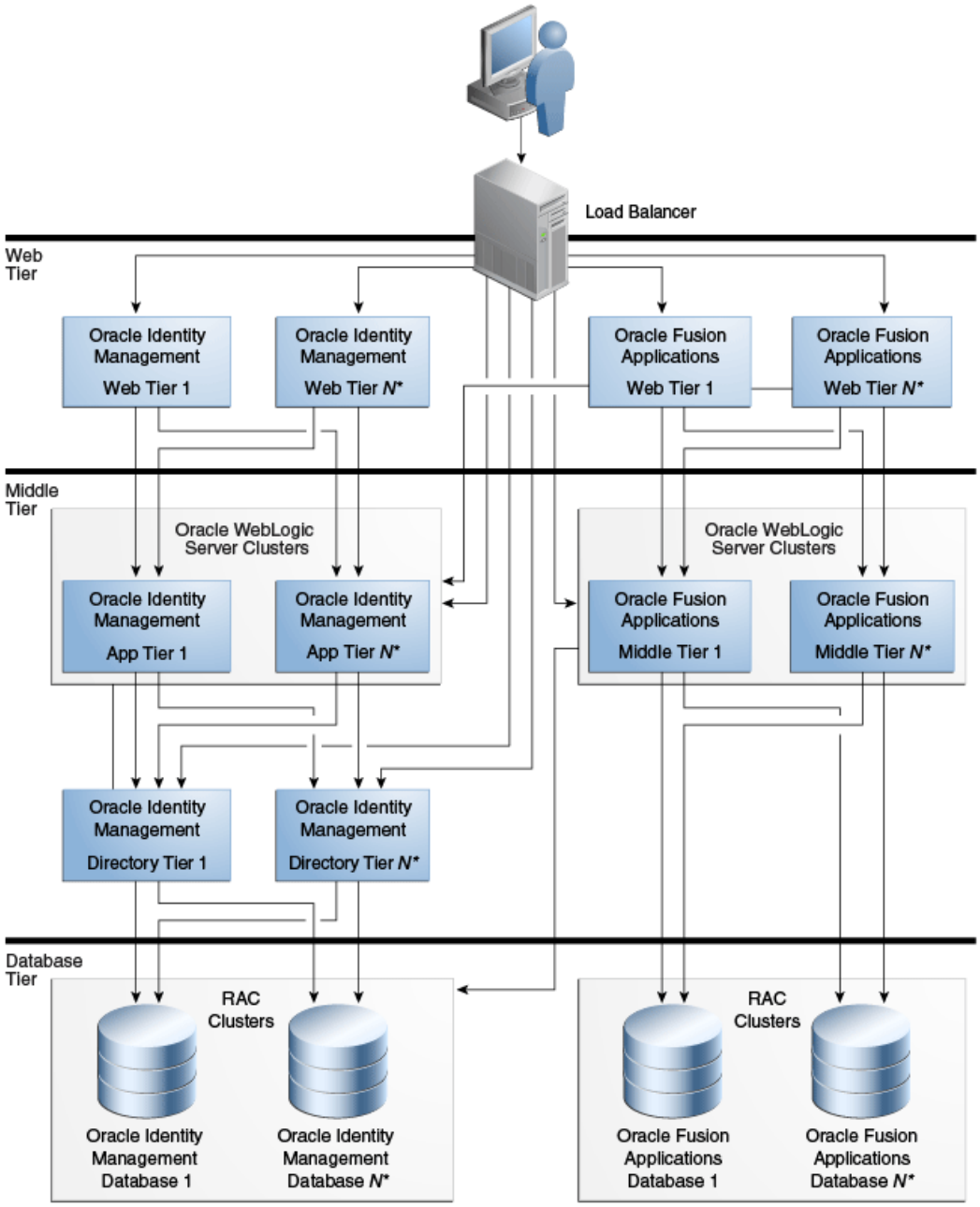
Number of Nodes	Node Contains	Sample Host Names
4	• **Node 1**: IDM Web, FA Web • **Node 2**: FA Mid* • **Node 3**: IDM Mid* • **Node 4**: FA DB, IDM DB	webhost.mycompany.com fahost.mycompany.com idmhost.mycompany.com dbhost.mycompany.co
4	• **Node 1**: IDM Web, FA Web • **Node 2**: FA Mid* • **Node 3**: IDM Mid*, IDM DB • **Node 4**: FA DB	webhost.mycompany.com fahost.mycompany.com idmhost.mycompany.com fadbhost.mycompany.com
5	• **Node 1**: IDM Web, FA Web • **Node 2**: FA Mid* • **Node 3**: IDM Mid* • **Node 4**: IDM DB • **Node 5**: FA DB	webhost.mycompany.com fahost.mycompany.com idmhost.mycompany.com idmdbhost.mycompany.com fadbhost.mycompany.com

Table 2-9 (Cont.) Sample Configurations of the Enterprise Topology

Number of Nodes	Node Contains	Sample Host Names
6	• **Node 1**: IDM Web • **Node 2**: FA Web • **Node 3**: FA Mid* • **Node 4**: IDM Mid* • **Node 5**: IDM DB • **Node 6**: FA DB	idmwebhost.mycompany.com fawebhost.mycompany.com fahost.mycompany.com idmhost.mycompany.com idmdbhost.mycompany.com fadbhost.mycompany.com

2.2.5 Enterprise Topology with High Availability

Figure 2-4 Oracle Fusion Applications Enterprise Topology with High Availability



*The Oracle Fusion Applications Middle Tier can be installed to multiple nodes. The Oracle Identity Management Middle Tier is installed in a single node and can be scaled out to multiple nodes.

The enterprise topology with high availability is the ideal Oracle Fusion Applications topology for production environments. The topology features a clear differentiation amongst the web, application, and data tiers. Install Oracle Fusion Applications domains to more than one machine so as to better support memory requirements. The

Oracle Identity Management middle tier can be installed to a maximum of two nodes using the Oracle Identity Management Provisioning Wizard, but additional nodes can be added manually post-installation. The use of a reverse load balancer is required to manage HTTP and TCP traffic.

The features of an enterprise topology Oracle Fusion Applications environment with high availability are shown in the following table.

Table 2-10 Features of the Enterprise Topology with High Availability

Feature	Used in Topology?
Nodes	8 or more
Oracle Identity Management and Oracle Fusion Applications shared node for middle and web tiers	No
Oracle Identity Management and Oracle Fusion Applications web tier DMZ setup	Optional
Reverse proxy or load balancer	Yes
High availability	Yes
Expandable post-installation	Yes

Sample configurations of the enterprise topology with high availability are shown in the following table. The following notation is used in the table:

- Oracle Fusion Applications: FA Web
- Oracle Fusion Applications Middle Tier: FA Mid
- Oracle Identity Management: IDM Mid
- Oracle Identity Management Web Tier: IDM Web
- Oracle Fusion Applications Database: FA DB
- Oracle Identity Management Database: IDM DB

The asterisk (*) following FA Mid indicates that the Oracle Fusion Applications middle tier can be split among multiple nodes. The asterisk (*) following IDM Mid indicates that the Oracle Identity Management middle tier can be split amongst two nodes.

Table 2-11 Sample Configurations of the Enterprise Topology with High Availability

Number of Nodes	Node Contains	Sample Host Names
8	• **Nodes 1-2**: IDM Web, FA Web • **Nodes 3-4**: FA Mid* • **Nodes 5-6**: IDM Mid* • **Nodes 7-8**: FA DB, IDM DB	webhost1.mycompany.com… webhost*N*.mycompany.com fahost1.mycompany.com… fahost*N*.mycompany.com idmhost1.mycompany.com… idmhost*N*.mycompany.com dbhost1.mycompany.com… dbhost*N*.mycompany.com

Table 2-11 (Cont.) Sample Configurations of the Enterprise Topology with High Availability

Number of Nodes	Node Contains	Sample Host Names
8	• **Nodes 1-2**: IDM Web, FA Web • **Nodes 3-4**: FA Mid* • **Nodes 5-6**: IDM Mid*, IDM DB • **Nodes 7-8**: FA DB	webhost1.mycompany.com… webhost*N*.mycompany.com fahost1.mycompany.com… fahost*N*.mycompany.com idmhost1.mycompany.com… idmhost*N*.mycompany.com fadbhost1.mycompany.com… fadbhost*N*.mycompany.com
10	• **Nodes 1-2**: IDM Web, FA Web • **Nodes 3-4**: FA Mid* • **Nodes 5-6**: IDM Mid* • **Nodes 7-8**: IDM DB • **Nodes 9-10**: FA DB	webhost1.mycompany.com… webhost*N*.mycompany.com fahost1.mycompany.com… fahost*N*.mycompany.com idmhost1.mycompany.com… idmhost*N*.mycompany.com idmdbhost1.mycompany.com… idmdbhost*N*.mycompany.com fadbhost1.mycompany.com… fadbhost*N*.mycompany.com
12	• **Nodes 1-2**: IDM Web • **Nodes 3-4**: FA Mid • **Nodes 5-6**: FA* • **Nodes 7-8**: IDM Mid* • **Nodes 9-10**: IDM DB • **Nodes 11-12**: FA DB	idmwebhost1.mycompany.com… idmwebhost*N*.mycompany.com fawebhost1.mycompany.com… fawebhost*N*.mycompany.com fahost1.mycompany.com... fahost*N*.mycompany.com idmhost1.mycompany.com… idmhost*N*.mycompany.com idmdbhost1.mycompany.com… idmdbhost*N*.mycompany.com fadbhost1.mycompany.com… fadbhost*N*.mycompany.com

2.3 Oracle Fusion Applications Directory Structure

After the Oracle Fusion Applications environment has been installed, the storage and directory layout will vary depending on the following factors:

- Paths selected during the provisioning process
- Whether the local configuration option was selected during the provisioning process
- Host names provided during the provisioning process

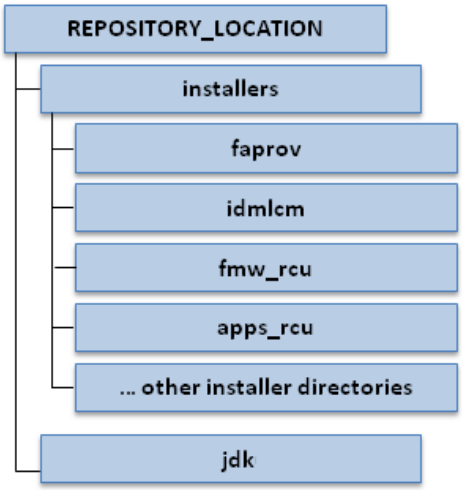
2.3.1 Installation Repository

The following diagram depicts the directory structure for the installation repository, which is created from the Oracle Fusion Applications install zip files that are

downloaded. The installation repository should be placed on a shared disk. The installation repository is only required during the installation process. It is no longer needed once the installation is complete.

The root directory for the installation repository is `REPOSITORY_LOCATION`.

Figure 2-5 Directory Structure for the Installation Repository



The directory structure is as follows, as shown in the previous diagram:

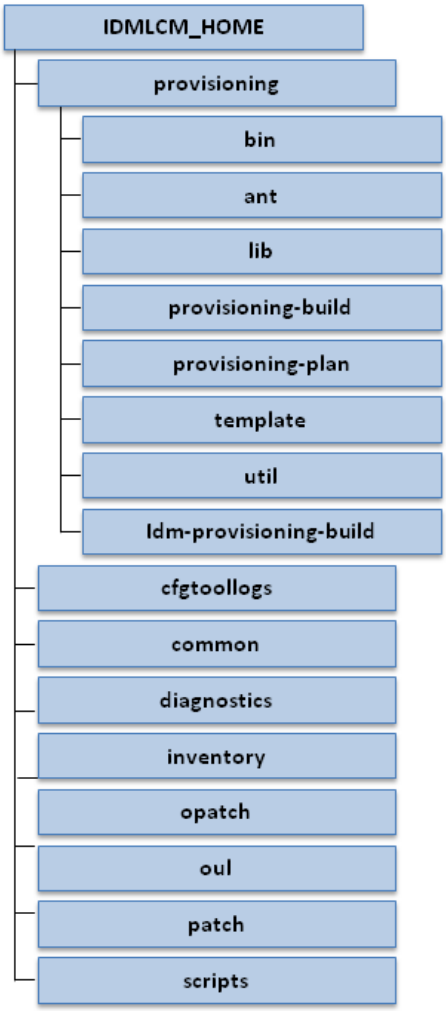
- `REPOSITORY_LOCATION`
- `REPOSITORY_LOCATION/installers`
- `REPOSITORY_LOCATION/installers/faprov`
- `REPOSITORY_LOCATION/installers/idmlcm`
- `REPOSITORY_LOCATION/installers/fmw_rcu`
- `REPOSITORY_LOCATION/installers/apps_rcu`
- `REPOSITORY_LOCATION/jdk`

2.3.2 Oracle Identity Management Provisioning Framework Directory Structure

The Oracle Identity Management provisioning framework should be installed on a shared disk. The framework will have the directory layout shown in the following figure.

The directory to which the Oracle Identity Management provisioning framework is to be installed is `IDMLCM_HOME`.

Figure 2-6 Oracle Identity Management Provisioning Framework Directory Structure



The directory structure shown in the previous figure is listed as follows:

- `IDMLCM_HOME`
- `IDMLCM_HOME/provisioning`
- `IDMLCM_HOME/provisioning/bin`
- `IDMLCM_HOME/provisioning/ant`
- `IDMLCM_HOME/provisioning/lib`
- `IDMLCM_HOME/provisioning/provisioning-build`
- `IDMLCM_HOME/provisioning/provisioning-plan`
- `IDMLCM_HOME/provisioning/template`
- `IDMLCM_HOME/provisioning/util`
- `IDMLCM_HOME/provisioning/idm-provisioning-build`
- `IDMLCM_HOME/cfgtoollogs`

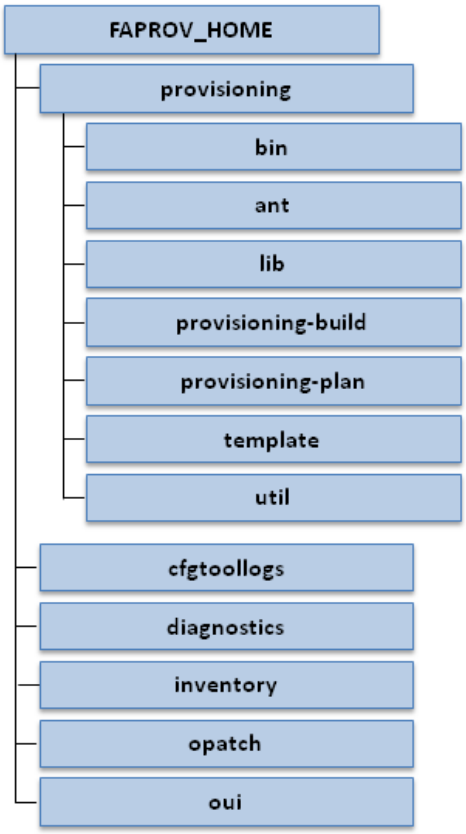
- IDMLCM_HOME/common
- IDMLCM_HOME/diagnostics
- IDMLCM_HOME/inventory
- IDMLCM_HOME/Opatch
- IDMLCM_HOME/oui
- IDMLCM_HOME/patch
- IDMLCM_HOME/scripts

2.3.3 Oracle Fusion Applications Provisioning Framework Directory Structure

The Oracle Fusion Applications provisioning framework should be installed on a shared disk. The following diagram shows the directory structure of the provisioning framework.

The directory to which the Oracle Fusion Applications provisioning framework is to be installed is FAPROV_HOME.

Figure 2-7 Oracle Fusion Applications Provisioning Framework Directory Structure



The directory structure shown in the previous figure is listed as follows:

- FAPROV_HOME
- FAPROV_HOME/provisioning
- FAPROV_HOME/provisioning/bin
- FAPROV_HOME/provisioning/ant
- FAPROV_HOME/provisioning/lib
- FAPROV_HOME/provisioning/provisioning-build
- FAPROV_HOME/provisioning/provisioning-plan
- FAPROV_HOME/provisioning/template
- FAPROV_HOME/provisioning/util
- FAPROV_HOME/cfgtoollogs
- FAPROV_HOME/diagnostics
- FAPROV_HOME/inventory
- FAPROV_HOME/Opatch
- FAPROV_HOME/oui

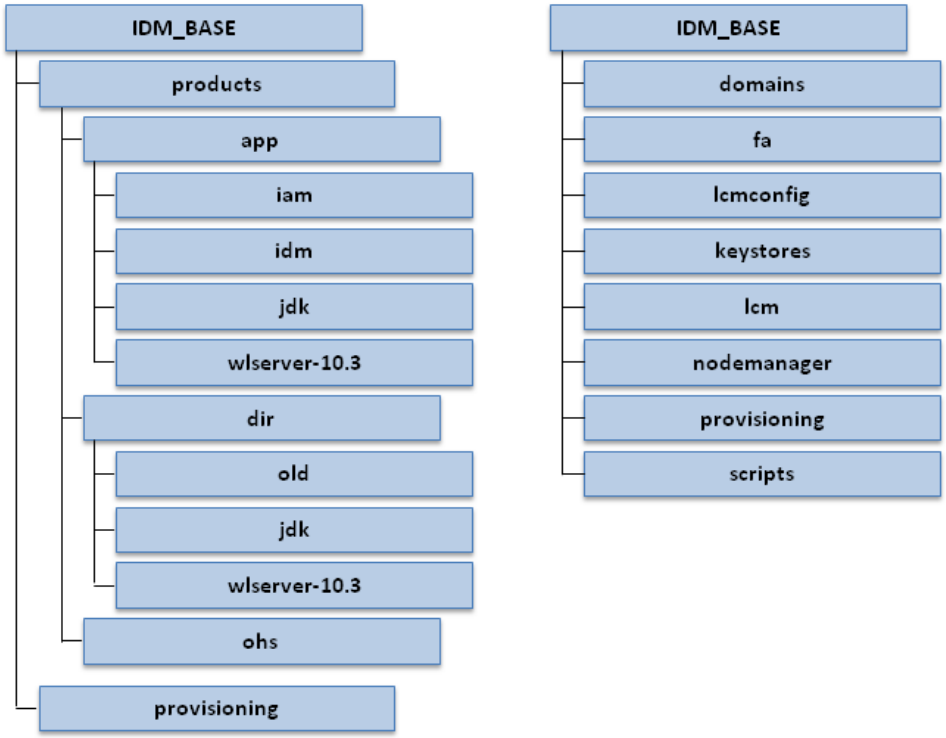
2.3.4 Oracle Identity Management Shared Directory Structure

The Oracle Identity Management directory structure may be placed in shared storage or in a combination of shared and local storage. The following diagram shows the shared directory structure.

The root directory for Oracle Identity Management product binary files is IDM_BASE. The root directory for Oracle Identity Management configuration and instance files is IDM_CONFIG.

The following diagram shows the structure of the shared Oracle Identity Management directories.

Figure 2-8 Oracle Identity Management Shared Directory Structure



The shared directory structure described in the previous diagram is listed here:

Table 2-12 Oracle Identity Management Shared Directory Structure

IDM_BASE	IDM_CONFIG
• IDM_BASE • IDM_BASE/products • IDM_BASE/products/app • IDM_BASE/products/app/iam • IDM_BASE/products/app/idm • IDM_BASE/products/app/jdk • IDM_BASE/products/app/wlserver-10.3 • IDM_BASE/products/dir • IDM_BASE/products/dir/oid • IDM_BASE/products/dir/jdk • IDM_BASE/products/dir/wlserver_1.0.3 • IDM_BASE/products/ohs • IDM_BASE/provisioning	• IDM_CONFIG • IDM_CONFIG/domains • IDM_CONFIG/fa • IDM_CONFIG/lcmconfig • IDM_CONFIG/keystores • IDM_CONFIG/lcm • IDM_CONFIG/nodemanager • IDM_CONFIG/provisioning • IDM_CONFIG/scripts

2.3.5 Oracle Identity Management Local Directory Structure

If local domain configuration is selected during Oracle Identity Management provisioning (`INSTALL_LOCALCONFIG_ENABLE=true`), certain Oracle Identity Management configuration directories are stored locally. All servers containing WebLogic Server domains or Oracle Application Server instances contain this directory.

The local root directory for Oracle Identity Management as defined by the provisioning wizard is `IDM_LOCAL_CONFIG`. The directory structure is shown in the following diagram.

Figure 2-9 Oracle Identity Management Local Directory Structure

The Oracle Identity Management local directory structure shown in the previous diagram is as follows:

- `IDM_LOCAL_CONFIG`
- `IDM_LOCAL_CONFIG/domains`
- `IDM_LOCAL_CONFIG/instances`

If local domain configuration is not selected during Oracle Identity Management provisioning, the Oracle Identity Management local directory structure is present in the shared directory location itself.

2.3.6 Oracle Identity Management DMZ Directory Structure

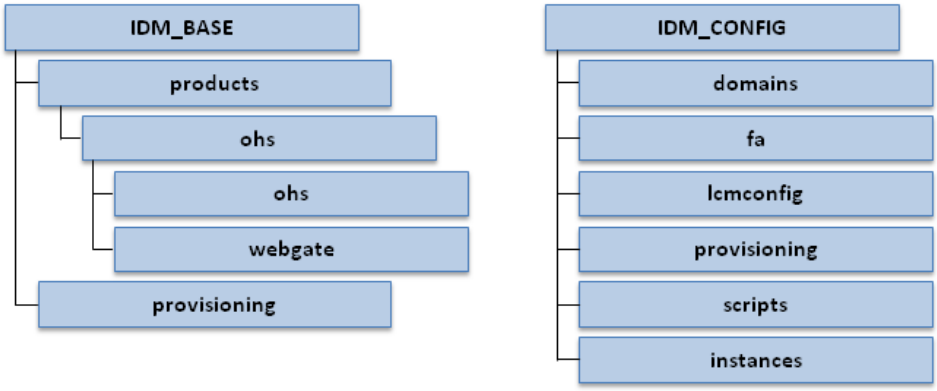
If he DMZ option is selected during Oracle Identity Management provisioning (`WEBTIER_DMZINSTALL_ENABLE=true`), the web tier Oracle Fusion Middleware home as well as the OHS instance directory are stored locally to the DMZ. The directory path used is the same as that for the shared storage, being `IDM_BASE` for the Fusion Middleware home and `IDM_CONFIG` for the configuration directory.

The root directory in the local configuration as defined by the provisioning wizard is `IDM_LOCAL_CONFIG`.

Additionally, if the local domain configuration option is selected during Oracle Identity Management provisioning (`INSTALL_LOCALCONFIG_ENABLE=true`), certain configuration directories are stored locally under the directory defined for `IDM_LOCAL_CONFIG`.

The following diagram illustrates the Oracle Identity Management DMZ directory structure.

Figure 2-10 Oracle Identity Management DMZ Directory Structure



The directory structure shown in the previous diagram is as follows:

Table 2-13 Oracle Identity Management DMZ Directory Structure

IDM_BASE	IDM_CONFIG
• IDM_BASE • IDM_BASE/products • IDM_BASE/products/ohs • IDM_BASE/products/ohs/ohs • IDM_BASE/products/ohs/webgate • IDM_BASE/provisioning	• IDM_CONFIG • IDM_CONFIG/domains • IDM_CONFIG/fa • IDM_CONFIG/lcmconfig • IDM_CONFIG/provisioning • IDM_CONFIG/scripts • IDM_CONFIG/instances

If the DMZ option is not selected during Oracle Identity Management provisioning, the Oracle Identity Management DMZ directory structure is present in the shared directory location itself.

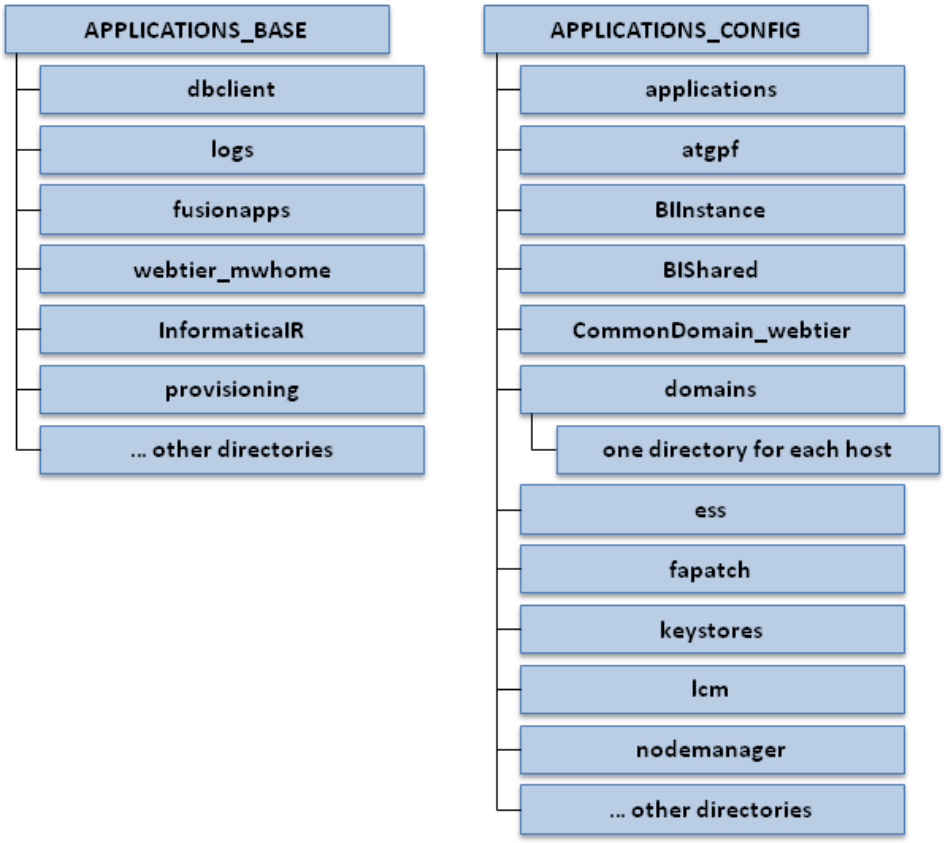
2.3.7 Oracle Fusion Applications Shared Directory Structure

The Oracle Fusion Applications directory structure may be stored in a shared directory or in a combination of shared and local storage.

The root directory for the Oracle Fusion Applications product binary files is `APPLICATIONS_BASE`. The root directory for the Oracle Fusion Applications configuration and instance files is `APPLICATIONS_CONFIG`.

The following diagram illustrates the Oracle Fusion Applications shared directory structure.

Figure 2-11 Oracle Fusion Applications Shared Directory Structure



The Oracle Fusion Applications shared directory structure shown in the previous diagram is listed as follows.

Table 2-14 Oracle Fusion Applications Shared Directory Structure

APPLICATIONS_BASE	APPLICATIONS_CONFIG
• APPLICATIONS_BASE • APPLICATIONS_BASE/dbclient • APPLICATIONS_BASE/logs • APPLICATIONS_BASE/fusionapps • APPLICATIONS_BASE/webtier_mwhome • APPLICATIONS_BASE/provisioning • Other directories	• APPLICATIONS_CONFIG • APPLICATIONS_CONFIG/applications • APPLICATIONS_CONFIG/atgpf • APPLICATIONS_CONFIG/BIInstance • APPLICATIONS_CONFIG/BIShared • APPLICATIONS_CONFIG/CommonDomain_webtier • APPLICATIONS_CONFIG/domains • APPLICATIONS_CONFIG/domains/one directory for each host • APPLICATIONS_CONFIG/ess • APPLICATIONS_CONFIG/fapatch • APPLICATIONS_CONFIG/keystores • APPLICATIONS_CONFIG/lcm • APPLICATIONS_CONFIG/nodemanager • Other directories

The BIIInstance directory is placed on shared storage only if the local domains configuration option is not selected.

The CommonDomain_webtier directory is placed in shared storage only if the DMZ option is not selected.

2.3.7.1 Applications Base Directory

When an environment consists of multiple hosts, a central, shared provisioning installation directory is required so that the location is visible to all provisioned hosts. To achieve this setup, the use of full host names is required. Alias names are not recommended.

The top-level directory for the Oracle Fusion Applications binaries is the applications base. Specify a name for this directory at the time of provisioning. This directory includes two mount points: */net/mount1/appbase* (APPLICATIONS_BASE) for components that remain read-only after provisioning, and */net/mount2* (APPLICATIONS_CONFIG) to contain instances that are configurable after provisioning. This structure aids performance issues and accommodates a "lock-down" of binaries after provisioning. It ensures that the configurable components remain available.

The applications base directory must not be set to the system root directory or set to the root directory of a logical drive. Some life cycle management tools compute directory names by backing up one directory level from the applications base directory and then appending the appropriate subdirectory name. These tools will fail if the applications base directory is set to the system root directory or set to the root directory of a logical drive because it is not possible to back up one directory level from the system root directory or from the root directory of a logical drive.

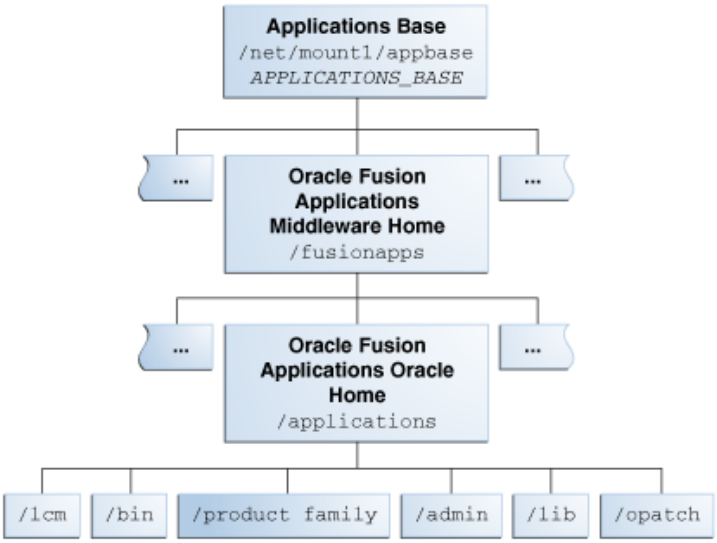
2.3.7.2 Oracle Fusion Applications Oracle Home Directory

In the context of Oracle Fusion Applications directory structures, the term home directory generally refers to a directory that contains one or more Oracle Fusion Middleware homes or Oracle Fusion Applications homes, which groups together related Oracle product offerings.

As the home directory is read-only, update it only by using Oracle Fusion Applications life cycle tools, such as Provisioning, Upgrade Orchestrator, and Patch Manager.

The Oracle Fusion Applications Oracle home directory (*FA_ORACLE_HOME*) is located under the *APPLICATIONS_BASE*/fusionapps directory (*net/mount1/appbase*/fusionapps). The /fusionapps directory is an Oracle Fusion Applications Middleware home (*APPLICATIONS_BASE/fusionapps*). Figure 2-12 (page 2-34) shows this directory structure.

Figure 2-12 Oracle Fusion Applications Oracle Home



The Oracle home contains the following subdirectories:

- **/fusionapps/applications/lcm**: The life cycle management directory. Contains the patching framework artifacts in the following subdirectories:
  - **../ad/bin**: Patching framework software and executables, including C artifacts and configuration scripts, that set the environment and start the corresponding utility.
  - **../ad/java**: Java artifacts.
  - **../ad/db/sql**: Database artifacts and SQL files.
  - **../ad/lib**: Application libraries.
  - **../ad/template**: Configuration files or templates delivered and used by the patching framework during configuration activities.
- **/fusionapps/applications/bin**: Executables called by Enterprise Scheduler Service jobs.

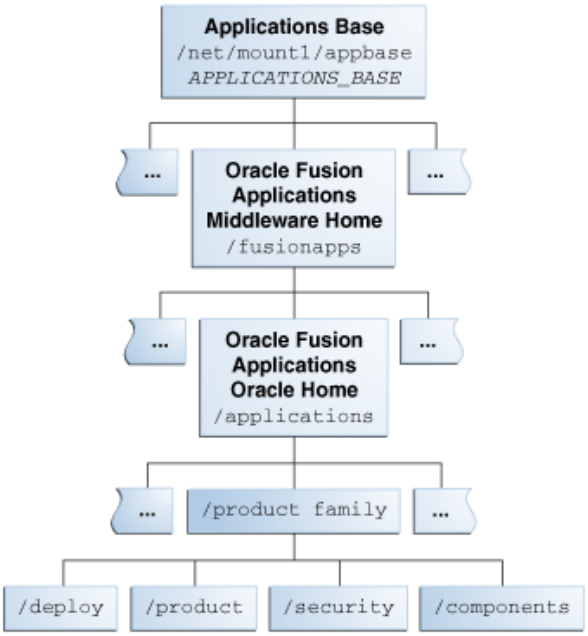
- **/fusionapps/applications/*product_family***: Container directory for artifacts specific to a product configuration, for example, `/ORACLE/fusionapps/fin`.
- **/fusionapps/applications/admin**: Patching framework environment properties file (*FUSION_env*.properties), Oracle Fusion Applications AutoPatch, and the patching logs, reports, and administration files. These files are required by Oracle Fusion Applications Patch Manager.
- **/fusionapps/applications/lib**: Applications-specific libraries.
- **/fusionapps/applications/OPatch**: Contains the OPatch utility called by Oracle Fusion Applications Patch Manager when patching middleware artifacts.

For complete information about patching the applications environment, see Introduction to Patching Oracle Fusion Applications in the *Oracle Fusion Applications Patching Guide*.

2.3.7.3 Oracle Fusion Applications Product Family Directory

The Oracle Fusion Applications *.../product_family* directory is located under the `FA_ORACLE_HOME` directory. This structure exists for each of the product configurations (product families) deployed in the Oracle Fusion Applications environment during provisioning. Figure 2-13 (page 2-35) shows this directory structure.

Figure 2-13 Oracle Fusion Applications Product Family Directory



The following subdirectories are located under the *.../product_family* directory:

- **/fusionapps/applications/*product_family*/*product***: Product grouping within a product family. For example, `/fusionapps/applications/fin/ar` represents the Account Receivables product in the Financials product family.
  - **/db/plsql/**: PL/SQL packages and bodies for a given product, for example, `.../fin/ar/db/plsql/arp_process_line.pkh`.

  - **/db/sql/**: SQL scripts for a given product. For example, `.../fin/ar/db/sql/ar_ar_rev_rec_typ_type.sql`.
  - **/db/data/*lba*/US/**: Product-specific seed data files, striped by Logical Business Area (LBA). Note that sub-directories could exist in the top-level seed data directory because some LBAs can have sub-LBAs. For example, `.../fin/ar/db/data/FinArCustomers/US/ArlookupTypeSD.xlf`.
- **/fusionapps/applications/*product_family*/deploy**: Container directory for deployable artifacts, composites, Java EE applications (such as Oracle Application Development Framework and Oracle Enterprise Scheduler Service).
- **/fusionapps/applications/*product_family*/security/**: Product family directory containing security-related files.

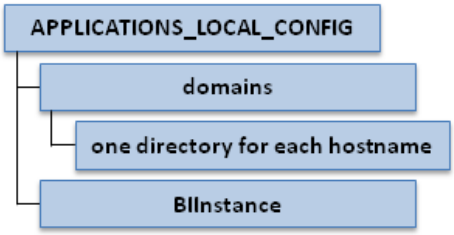
2.3.8 Oracle Fusion Applications Local Directory Structure

If the local domain configuration option is selected during Oracle Fusion Applications provisioning (`INSTALL_LOCALCONFIG_ENABLE=true`), certain configuration directories are stored locally. All servers containing domains or Oracle Application Server instances will include this directory.

The local root configuration directory as defined in the provisioning wizard is `IDM_LOCAL_CONFIG`.

The following diagram illustrates the Oracle Fusion Applications shared directory structure.

Figure 2-14 Oracle Fusion Applications Local Directory Structure



The directory structure shown in the previous diagram is listed here.

- `APPLICATIONS_LOCAL_CONFIG`
- `APPLICATIONS_LOCAL_CONFIG/domains`
- `APPLICATIONS_LOCAL_CONFIG/domains/`one directory for each host name
- `APPLICATIONS_LOCAL_CONFIG/BIInstance`

2.3.9 Oracle Fusion Applications DMZ Directory Structure

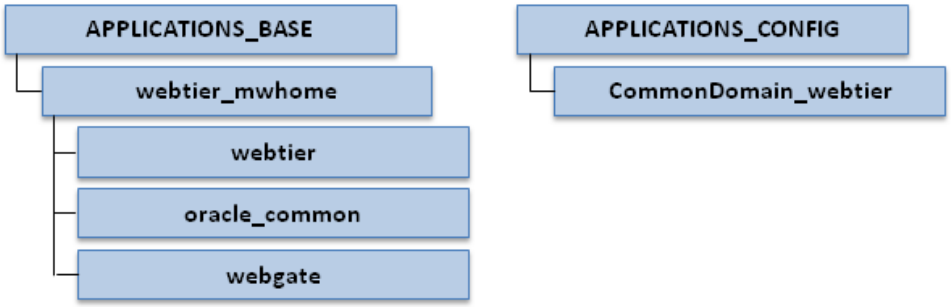
If the DMZ option is selected during Oracle Fusion Applications provisioning (`WEBTIER_DMZINSTALL_ENABLE=true`), the web tier Fusion Middleware home and the OHS instance directory are stored locally to the DMZ. The directory path used is the same as that defined for shared storage (`APPLICATIONS_BASE` for the Fusion Middleware home and `APPLICATIONS_CONFIG` for the configuration directory).

The tool local configuration directory as defined in the provisioning wizard is `APPLICATIONS_LOCAL_CONFIG`.

Additionally, if the local domain configuration option is selected during Oracle Identity Management provisioning (`INSTALL_LOCALCONFIG_ENABLE=true`), certain configuration directories are stored locally under the directory defined for `APPLICATIONS_LOCAL_CONFIG`.

The following diagram illustrates the Oracle Fusion Applications DMZ directory structure.

Figure 2-15 Oracle Fusion Applications DMZ Directory Structure



The directory structure shown in the previous diagram is listed here.

Table 2-15 Oracle Fusion Applications DMZ Directory Structure

APPLICATIONS_BASE	APPLICATIONS_CONFIG
• APPLICATIONS_BASE • APPLICATIONS_BASE/webtier_mwhome • APPLICATIONS_BASE/webtier_mwhome/webtier	• APPLICATIONS_CONFIG • CommonDomain_webtier

2.4 Oracle Fusion Applications Runtime Processes

A running Oracle Fusion Applications environment includes the following runtime processes:

- Databases: These include Oracle Fusion Applications and Oracle Identity Management databases; Oracle Fusion Applications data warehouse.
- Oracle Application Server instances: Run C-based and Java SE components. These include Oracle Internet Directory, Oracle Fusion Applications HTTP server, Oracle Identity Management HTTP server, Oracle Global Order Processing, and Oracle Business Intelligence.
- Oracle WebLogic Server domains: These run Java EE-based components, and include administration and managed servers, as well as the node manager.

2.4.1 Database Instances and Other Processes

Both Oracle Identity Management and Oracle Fusion Applications have their own databases, as listed in the following table.

Table 2-16 Database Instances in Oracle Fusion Applications

Provisioned Environment	Database	Sample Schemas	Comments
Oracle Identity Management	Oracle Identity Management Database	FA_OAM	Contains the schemas for Oracle Identity Management products such as Oracle Access Manager.
Oracle Identity Management	Oracle Internet Directory Database	ODS ODSSM	Contains the Oracle Internet Directory schemas. Optional as a separate database, otherwise the Oracle Identity Management database is used.
Oracle Fusion Applications	Transactional Database	FUSION FUSION_RUNTIME	Contains the transactional schemas for Oracle Fusion Applications.
Oracle Fusion Applications	Data warehouse Database	<*prefix*>_DW is the major data warehouse schema, where <*prefix*> is the schema prefix selected when the Oracle Business Intelligence Data warehouse RCU runs.	Contains the schemas for the Oracle Fusion Applications Datawarehouse.

2.4.2 Oracle Application Server Instances

Oracle Application Server instances in the Oracle Fusion Applications environment are listed here.

Application Server Instances in the Provisioned Oracle Identity Management Environment

- Oracle Internet Directory
- Oracle Identity Federation
- Oracle HTTP Server

Application Server Instances in the Oracle Fusion Applications Environment

- Oracle Global Order Promising
- Oracle HTTP Server

- Oracle Business Intelligence

2.4.3 Oracle WebLogic Server Domains

The topology for an applications environment centers around a set of predefined Oracle WebLogic Server domains. The provisioning process creates these domains during the physical installation. It then deploys the product offerings selected for installation in the associated product family domain. It also deploys common applications for use by all product offerings and their dependent middleware components.

After provisioning is complete, scale out Oracle Fusion Middleware components, such as Oracle HTTP Server and Oracle SOA Suite, and product domains, such as Oracle Fusion Customer Relationship Management domain, Oracle Fusion Common domain, Oracle Fusion Human Capital Management domain, and so on.

A WebLogic Server domain is a logically related group of Oracle WebLogic Server resources that is managed as a unit. It consists of an Administration Server and one or more Managed Servers. A managed server hosts components and associated resources that constitute each product configuration. The domains are predefined to ensure that product offerings and their dependencies are always stored in a standardized arrangement.

In each domain, every Managed Server belongs to a cluster. A cluster is a group of Oracle WebLogic Servers that work together to provide scalability and high availability for applications. A cluster appears as a single Oracle WebLogic Server instance. The Managed Server instances that constitute a cluster can run on the same host or be located on different hosts. Applications are deployed to the cluster, which implies deployment to every Managed Server within the cluster.

The WebLogic Server domains run Java EE-based components and include administration and managed servers, as well as the node manager.

The WebLogic Server domains that are part of a Oracle Fusion Applications environment are listed here.

WebLogic Server Domains in the Provisioned Oracle Identity Management Environment

- `IDMDomain`. Always available.

WebLogic Server Domains in the Provisioned Oracle Fusion Applications Environment

- CommonDomain. Always available.
- HCMDomain. Always available.
- CRMDomain. Always available.
- FinancialsDomain. Always available.
- BIDomain. Always available.
- SCMDomain. Available only with the following offerings: Oracle Fusion Customer Relationship Management, Oracle Fusion Financials, and Oracle Fusion Supply Chain Management.
- ProcurementDomain. Available only with the following offerings: Oracle Fusion Financials and Oracle Fusion Supply Chain Management.

- ProjectsDomain. Available only with the following offering: Oracle Fusion Financials.
- ICDomain. Available only with the following offering: Oracle Fusion Incentive Compensation.
- OSNDomain. Available only when Oracle Social Network is configured.
- HigherEdDomain. Available only in SaaS when Student Management is configured.

For more information about the enterprise deployment of domains and instructions about scale out, see Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1).

2.5 Access Oracle Fusion Applications

End users access Oracle Fusion Applications through a set of URLs defined during the provisioning process (the provisioning wizard calls them external URLs). Depending on whether the topology includes a load balancer or reverse proxy, Oracle Fusion Applications URL endpoints may be at the load balancer or reverse proxy, or directly at the Oracle HTTP Server.

The main end user entry point to Oracle Fusion Applications is generally a URL similar to the following:

```
https://fusionapps-common.mycompany.com/homePage
```

Each product family may have its own host name or port, depending on the web tier and load balancer configuration in the provisioning wizard.

Administrators can access the administration consoles through a set of internal or administrative URLs defined in the provisioning wizard. Administrators can use Oracle Enterprise Manager Fusion Applications Control and Oracle Enterprise Manager Cloud Control Console to manage the Oracle Fusion Applications environment.

As with all URLs in Oracle Fusion Applications, access is subject to authentication through Oracle Access Manager.

For more information about using Fusion Applications Control and Cloud Control Console, see Get Started with Enterprise Manager Cloud Control in the *Oracle Fusion Applications Administrator's Guide*.

2.6 Next Steps

Now after having e a grasp of the basic process of provisioning, and an idea of the structure and topologies of Oracle Fusion Applications environments, plan the deployment. Proceed to the Planning section for more information.

3 Plan the Topology and Provisioning of the Installation

Planning an Oracle Fusion Applications installation is a prerequisite to a successful install, and may involve a variety of users. To plan the installation fully, it might be necessary to collaborate with database administrators, network engineers, and other specialized administrators within the organization. This material also assumes that at least one person is guiding the installation overall and is taking the role of the "Oracle Fusion Applications Administrator".
The planning material is split into two sections, Plan the Topology and Provisioning of the Installation (page 3-1), and Plan the Configuration of the Components of the Installation (page 4-1). Though the material is divided, all the tasks are important and relate sequentially to each other.

There is also a companion Microsoft Excel spreadsheet, the *Oracle Fusion Applications Installation Workbook*, that is filled out during the planning phase.

3.1 Introduction

Planning includes the following subjects:

- Introduction (page 3-1) where the various sections are outlined and the Workbook is introduced.
- Environment: Completing the Environment Tab Entries (page 3-4): Helps to define the basic environment configuration and fill out the first tab of the Workbook.
- Provisioning: Planning the Configuration of the Provisioned Installation (page 3-8): Helps to define the licensed offerings and components that are installed using the Provisioning Wizard, and points to a list of post-provisioning tasks to be performed.
- Topology: Planning the Topology (page 3-12): Helps to define the topology to be used and how components are assigned to each node of the topology.
- Network- Virtual Hosts: Planning Network Configuration (page 4-1): Helps to understand networking concepts used by Oracle Fusion Applications as well as prerequisites and how to fulfill them before starting the provisioning process.
- Network-Ports: Planning Ports (page 4-14): Shows the default ports and where they can be changed if necessary.
- Storage: Planning Storage Configuration (page 4-15): Helps to understand storage requirements and plan for them.
- Database: Planning Database Configuration (page 4-23): Explains database usage in Oracle Fusion Applications and helps to plan for the creation of the required databases.
- Identity Management: Planning Oracle Identity Management Configuration (page 4-30): Explains key concepts needed to plan for the Oracle Identity

Management provisioning and to understand its integration with Oracle Fusion Applications and other components.

- SSL and Certificates (page 4-33): Gives tips on completing the SSL and Certificates section of the Workbook.

While all of these areas are equally important, certain areas are more closely related to certain roles, for example, the "Planning the Database" section is normally used by the database administrator, while the "Planning the Network Configuration" section is normally used by network engineers.

3.1.1 Use the Oracle Fusion Applications Installation Workbook

The *Oracle Fusion Applications Installation Workbook* is a companion document to this guide. It is used by the architects, system engineers, and implementers to plan and record all the details for an environment installation (such as server names, URLs, port numbers, installation paths, etc.). The *Oracle Fusion Applications Installation Workbook* is a single input for the entire process, allowing for:

- Separation of tasks between architects, system engineers and implementers
- Comprehensive planning before the implementation
- Validation of planned decisions before actual implementation
- Consistency during implementation
- A record of the environment for future use

A typical use case for the *Oracle Fusion Applications Installation Workbook* is:

- Architect(s) read through the first five sections of this guide, and fill in the corresponding sections of the *Oracle Fusion Applications Installation Workbook*;
- The *Oracle Fusion Applications Installation Workbook* is validated by other architects and system engineers;
- Architect uses the validated plan to initiate network and system change requests with system engineering departments;
- Implementer or System Integrator uses the *Oracle Fusion Applications Installation Workbook* and the subsequent sections of this guide as input/instructions to perform the installation and configuration tasks.

3.1.1.1 Oracle Fusion Applications Installation Workbook Structure

The *Oracle Fusion Applications Installation Workbook* is divided into the tabs listed below. Each section of Plan the Topology and Provision of the Installation (page 3-1) and Plan the Configuration of the Components of the Installation (page 4-1) contains a corresponding *Oracle Fusion Applications Installation Workbook* reference section, to guide in filling out the worksheets step-by-step.

- Environment (Environment: Complete the Environment Tab Entries (page 3-4))
- Provisioning (Provisioning: Plan the Configuration of the Provisioned Installation (page 3-8))
- Topology (Topology: Plan the Topology (page 3-12))
- Network - Virtual Hosts (Network- Virtual Hosts: Plan Network Configuration (page 4-1))

- Network - Ports (Network-Ports: Plan Ports (page 4-14))
- Storage (Storage: Plan Storage Configuration (page 4-15))
- Databases (Database: Plan Database Configuration (page 4-23))
- Identity Management (Identity Management: Plan Oracle Identity Management Configuration (page 4-30))
- SSL (SSL and Certificates (page 4-33))

3.1.2 Plan for Platform-Specific Considerations

There are specific platform requirements for desktop tools, the Repository Creation Assistant, OAM modes, the Business Intelligence Applications tool, and print servers.

3.1.2.1 Desktop Tools

Windows only:

- Smart View
- ADF Desktop integration/ADFdi
- Hyperion Financial Reporting Studio
- Financial Reporting Center
- MS Project integrations
- Financials requires print servers on Windows for ODC / OFR

It is also necessary to have network sharing between Windows and non-Windows platforms, in order to use the Windows-only applications.

Power-users may need to set up a Windows Remote Desktop Connection.

3.1.2.2 Oracle Fusion Applications Repository Creation Utility (Oracle Fusion Applications RCU)

Windows or Linux only

The Oracle Fusion Applications RCU can run against databases on any platform. However, the Oracle Fusion Applications RCU is only available on the Linux and Windows platforms. This means if Oracle Fusion Applications is being installed on another platform, plan to make a Linux or Windows host available specifically to run the Oracle Fusion Applications RCU.

3.1.2.3 OAM Modes Supported

OAM modes support for Oracle Fusion Applications depends on the platform being used. For all platforms, only **Simple** mode is supported. For more information about OAM modes, see Oracle Access Manager Transfer Mode (page 4-31).

3.1.2.4 BI Administration Tool

The BI Administration tool is required to manage the Business Intelligence repository and must be used to update database details for Business Intelligence connections.

This tool is only available on the Windows platform. Plan to make at least one Windows host available to use this tool.

3.1.2.5 Print Servers

Oracle Financials requires print servers on Windows in order to use Oracle Data Capture/Oracle Forms Recognition.

3.2 Environment: Complete the Environment Tab Entries

The Environment tab includes basic Environment Info, Email settings, and Web Proxy information tables. The basic Info table requires understanding of the topologies described in Oracle Identity Management Topologies (page 3-4) and Oracle Fusion Applications Topologies (page 3-4).

3.2.1 Oracle Identity Management Topologies

The Oracle Identity Management Provisioning Wizard supports three topology types for Oracle Identity Management. These topologies are related to the type of environment being created (e.g. development, test, production) and the desired availability (HA, non-HA). In the table below, the "Corresponding Sample Topolog[ies]" are described in Oracle Fusion Applications Topologies (page 2-13).

Oracle Identity Management Topology Type	Corresponding Sample Topology	Notes
Single Host	Basic	Recommended for dev/demo environments only Installs all tiers (Directory, Access, Web) on the same host No LBR required Uses OID as the Identity Store
EDG Topology	Enterprise Non-HA	Recommended for enterprise environments where high-availability is not required. Provides the option to install the 3 tiers on up to 3 different hosts. LBR required Uses OID as the Identity Store
EDG Topology + Configure second application instances	Enterprise HA	Recommended for enterprise environments with high availability requirements. Provides the option to install the 3 tiers on up to 6 different hosts (with 2 hosts per tier - primary and secondary). LBR required Uses OID as the Identity Store

3.2.2 Oracle Fusion Applications Topologies

The Oracle Fusion Applications Provisioning Wizard supports three topology types as well, but unlike the Oracle Identity Management topologies, Oracle Fusion Applications topologies are not necessarily related to the type of environment being created

(development, test, production) and none of them provides high availability out of the box. (High availability for Oracle Fusion Applications components must be done manually, as a post-install step). Instead, these topologies define how the various Oracle Fusion Applications components are split across servers, so the main driver for this decision should be server hardware capacity (memory and processing power).

Additionally, these topologies apply only to the Mid Tier. The Web Tier can use a separate host or, if desired, share the same host with the Mid Tier.

Oracle Fusion Applications Topology Type	Notes
One host for all domains	Recommended for environments where a single server can handle the memory and CPU requirements for all Oracle Fusion Applications mid tier components.
One host per domain	Recommended for environments where a single server cannot handle the memory and CPU requirements for all Oracle Fusion Applications mid tier components, so splitting the domains across different hosts is necessary. This topology allows to assign entire domains to specific hosts, and different domains can share the same host if desired.
One host per application and Middleware component	Recommended for environments where a single server cannot handle the memory and CPU requirements for all Oracle Fusion Applications mid tier components, so splitting the domains across different hosts is necessary. This topology allows to assign each individual component (WebLogic AdminServer or Managed Server) to a specific host, allowing for maximum flexibility in component assignment.

3.2.3 Complete the Environment Info Table

This area is informational and used to orient all the people who interacts with this Workbook about the current installation environment.

Table 3-1 Environment

Name	Required	Description
Company Name	No	My Company
Environment Type	Yes	Select the operating systems used for Oracle Fusion Applications, Oracle Identity Management, and the database(s).
Oracle Fusion Applications Version	Yes	Enter the Oracle Fusion Applications version number that is being installed, as well as the Oracle Identity Management version number. This is important for patching.
Install Type	No	Entries such as "dev", "qa" or "prod" help others understand the use case for this particular installation.
Domain Name	Yes	`www.mycompany.com`

Table 3-1 (Cont.) Environment

Name	Required	Description
Topology Type for Oracle Identity Management	Yes	Select the corresponding type of Oracle Identity Management installation to run: Single Host, EDG (Enterprise), or EDG with added nodes. See Oracle Identity Management Topologies (page 3-4).
Topology Type for Oracle Fusion Applications	Yes	Select which type of provisioning-wizard based installation is run for Oracle Fusion Applications: One host, One host per domain, or One host per application and Middleware component. See Oracle Fusion Application Topologies (page 3-4).
Load Balancer or Reverse Proxy	Yes	Select an option based on whether a load balancer or reverse proxy is used or not and the how the load balancer or reverse proxy is used.

3.2.4 Complete the Email Server Table

During both Oracle Fusion Applications and Oracle Identity Management Provisioning, email server information must be entered. Oracle Fusion Applications sends emails to end-users and administrators for notification (business processes, Identity Management) and, if CRM is installed, also for marketing purposes. An e-mail server is required to send out these messages and normally the corporate e-mail server is used for this purpose

If corporate email is used, fill in the appropriate part of the Oracle Fusion Applications using the table below for guidance.

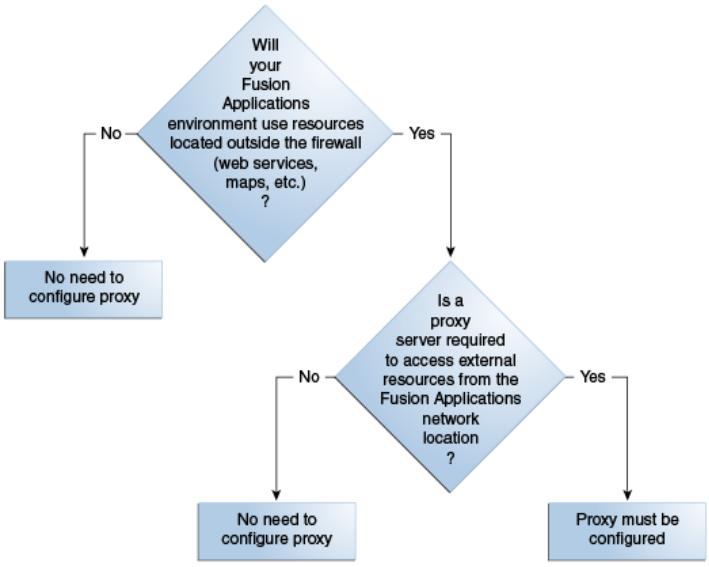
Table 3-2 Environment: Email

Name	Sample Value	Notes
SMTP Server Host	`mail.mycompany.com`	N/A
SMTP Server Port	25	25 is the standard value; other ports can be used.
SMTP Server Security	open	There are two possibilities: open or authentication required. Applies to Oracle Identity Management Provisioning only.
SMTP Username	N/A	This user name is only required if server security is not open and requires authentication. Applies to Oracle Identity Management Provisioning only.

3.2.5 Complete the Web Proxy Table of the Oracle Fusion Applications Installation Workbook

Oracle Fusion Applications supports configuring a web proxy host for use whenever Oracle Fusion Applications must access resources (e.g. web services, maps, etc.) that are located outside the firewall. Verify with the network administrator if a proxy server is needed in order for Oracle Fusion Applications to access external resources; if so, then web proxy information must be provided during Oracle Fusion Applications Provisioning.

Figure 3-1 Web Proxy decision tree



Note that this proxy configuration is server-side and not related to the proxy configuration available in end-user's web browsers.

To incorporate an existing web proxy into the Oracle Fusion Applications environment, then enter the details in the Workbook, following the guidelines below.

Table 3-3 Environment: Web Proxy

Name	Sample Value	Description
Proxy Host	`proxy.mycompany.com`	Proxy host name
Proxy Port	80 and 443	Standard non-SSL and SSL ports are the default
Secure Proxy	yes | no	SSL or non-SSL configuration
Proxy Exceptions	N/A	Any proxy exceptions
Proxy Username		Used if secure proxy is enabled

3.3 Provisioning: Plan the Configuration of the Provisioned Installation

Oracle Fusion Applications is delivered as a suite, but can be adopted modularly. It can be adopted as a single suite, as product offerings (the highest level collection of functionality that can be licensed and implemented), or as solutions sets that work with other Oracle Applications Unlimited product lines.

The offerings were licensed when Oracle Fusion Applications was purchased, and in the Provisioning Wizard select the offerings planned to be installed as part of the complete Oracle Fusion Applications install. The offerings selected define, among other things:

- The product families and respective WebLogic domains that are configured
- The applications that are installed
- The tech stack components that are installed

3.3.1 Provisioning: Indicate the Oracle Fusion Applications Offerings to Install

This table provides helpful reference for all users of the *Oracle Fusion Applications Installation Workbook*.

3.3.1.1 Complete the Oracle Fusion Applications Offerings Table

Enter the Oracle Fusion Applications product offerings that were licensed by the enterprise.

Family	Offering	Install?
Oracle Fusion Customer Relationship Management	Marketing	Enter Yes or No
Oracle Fusion Customer Relationship Management	Sales	Enter Yes or No
Oracle Fusion Financials	Financials	Enter Yes or No
Oracle Fusion Financials	Procurement	Enter Yes or No
Oracle Fusion Financials	Projects	Enter Yes or No
Oracle Fusion Human Capital Management	Workforce Deployment	Enter Yes or No
Oracle Fusion Human Capital Management	Workforce Development	Enter Yes or No
Oracle Fusion Human Capital Management	Compensation Management	Enter Yes or No

Family	Offering	Install?
Oracle Fusion Supply Chain Management	Product Management	Enter Yes or No
Oracle Fusion Supply Chain Management	Order Orchestration	Enter Yes or No
Oracle Fusion Supply Chain Management	Manufacturing and Supply Chain Material Management	Enter Yes or No
Oracle Fusion Supply Chain Management	Price Management	Enter Yes or No
Oracle Fusion Supply Chain Management	Value Chain Planning	Enter Yes or No
Oracle Fusion Supply Chain Management	Material, Management and Logistics	Enter Yes or No
Oracle Fusion Supply Chain Management	Supply Chain Financial Orchestration	Enter Yes or No
Oracle Fusion Customer Data Hub	Not Applicable	Enter Yes or No
Oracle Fusion Enterprise Contracts	Not Applicable	Enter Yes or No
Oracle Fusion Accounting Hub	Not Applicable	Enter Yes or No
Oracle Fusion Incentive Compensation	Not Applicable	Enter Yes or No

3.3.2 Provisioning: Describe the Oracle Identity Management Components

The Oracle Identity Management installation also includes multiple components, all of which are installed by default. Note that Oracle Identity Federation (OIF) is not automatically configured and its use is optional.

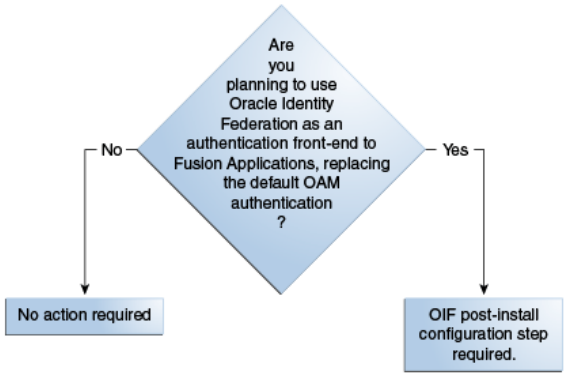
To review the Oracle Identity Management Toplogies, see Oracle Identity Management Topologies (page 3-4).

A brief discussion about whether to use OIF is below.

3.3.2.1 OIF

Oracle Identity Federation is installed by default, and can be used for federation. The federation package of standard protocols allows Oracle Identity Management to communicate with an external identity or service provider. See Configure Oracle Identity Federation (page 16-23).

Figure 3-2 Oracle Federation Decision Tree



3.3.2.2 Complete the Oracle Identity Management Components Table

By default, all the components are installed by the Provisioning Wizard. Annotate the decisions regarding topolgy and Identity Store in the workbook.

3.3.3 Provisioning: Select the Patches to Apply

Certain patches or bundles may be required for the installation, which are not included in the downloaded install files. Check the *Oracle Fusion Applications release notes* for mandatory patches to the Oracle Fusion Applications database, Oracle Identity Management, and Oracle Fusion Applications core. To install any languages in addition to US English, check the *Oracle Fusion Applications NLS release notes* for mandatory patches for languages.

For general information about applying patches to an applications environment, see Introduction to Patching Oracle Fusion Applications in the *Oracle Fusion Applications Patching Guide*. For database patches, check:

- Oracle Identity Management: Patch the Oracle Database (page 7-2)
- Oracle Fusion Applications: Mandatory Oracle Database Patches (page 8-8)

3.3.4 Provisioning: Select the Post-Installation Tasks to Perform

The **Post-Install Tasks** table lists all of the mandatory and conditional post-installation activities. These are described in Complete Mandatory Common Post-Installation Tasks (page 15-1).

Conditional tasks are performed only if the environment meets the criteria defined for those tasks. To determine whether conditional post-install tasks apply in this case, review the following sections:

- Complete Conditional Common Post-Installation Tasks (page 16-1)
- Complete Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management (page 17-1)
- Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1)

- Complete Oracle Fusion Customer Relationship Management Post-Installation Tasks (page 19-1)
- Complete Oracle Fusion Financials Post-Installation Tasks (page 20-1)
- Complete Oracle Fusion Applications Accounting Hub Post-Installation Tasks (page 21-1)
- Complete Oracle Fusion Human Capital Management Post-Installation Tasks (page 22-1)
- Complete Oracle Fusion Incentive Compensation Post-Installation Tasks (page 23-1)
- Complete Oracle Fusion Project Portfolio Management Post-Installation Tasks (page 24-1)
- Complete Oracle Fusion Supply Chain Management Post-Installation Tasks (page 25-1)

Enter the decisions as appropriate in the Workbook.

3.3.4.1 Select Languages

To install any languages in addition to US English, select the languages to install from the following list of supported languages.

- Arabic (ar / AR)
- Chinese (Simplified) (zh_CN / ZHS)
- (Chinese (Traditional) (zh_TW / ZHT)
- Czech (cs / CS)
- Danish (da / DK)
- Dutch (nl / NL)
- Finnish (fi / SF)
- French (fr / F)
- French (Canadian) (fr_CA / FRC)
- German (de / D)
- Hebrew (iw / IW)
- Hungarian (hu / HU)
- Italian (it / I)
- Japanese (ja / JA)
- Korean (ko / KO)
- Norwegian (no / N)
- Polish (pl / PL)
- Portuguese (Brazilian) (pt_BR / PTB)
- Russian (ru / RU)
- Spanish (es / E)
- Swedish (sv / S)

- Turkish (tr / TR)

3.4 Topology: Plan the Topology

Topology planning refers to the tasks related to:

- Determining how many and what type of servers are going to be used for the environment
- Defining their logical location in the network
- Defining which Oracle Fusion Applications component(s) run on each server
- Deciding how to handle the Demilitarized Zone (DMZ) is part of network and topology planning. A special section is devoted to this topic when completing the Topology tables in the Workbook.

While the number of nodes, their characteristics, and even component allocation are likely to have already been defined during the sizing/licensing phase, this is the moment in the planning phase where they are reviewed and any remaining topology decisions or adjustments are made.

Remember that in case of choosing to clone a topology in order to maintain a test or staging backup, the two environments must match from the beginning. It is not possible to move from a *Basic* topology, used for development, to an *Enterprise* topology for production, using cloning tools.

Therefore, in this case it is recommended that topology decisions consider not only the immediate environment needs, but also future changes to this environment, as well as other environments that will be created through cloning.

3.4.1 Review Component and Server Allocation

Component assignment to specific servers normally have already been done during the sizing phase of the project, but this is a good time to review those decisions since, once installed, Oracle Identity Management and Oracle Fusion Applications components cannot usually be moved to other servers.

When reviewing component allocation, consider the following:

- CPU capacity
- Amount of memory available on the server vs. what is required by the assigned components
- Network location (for example: DMZ)
- Access to shared storage
- Scale-out nodes should have the same characteristics as the corresponding primary node

3.4.2 Complete the Topology Tab of the Oracle Fusion Applications Installation Workbook

Follow the explanations for each column name to fill in the **Topology** table:

- **Nodes:** Typically, an installation consists of a minimum of three nodes: one for the transactional database, one for Oracle Identity Management, and one for

Oracle Fusion Applications (This would be the *Basic* topology). If this is not the situation, list each component next to Node numbers 1-3, entering the Real Host Name. If multiple hosts have been chosen for Oracle Fusion Applications, and/or additional Oracle Identity Management or database hosts are used, then assign each of them to an additional node number. The node number is simply used as a reference number, for user ease, when filling in the Workbook.

- **Real Host Name:** This is the name assigned in the operating system. The network administrator who sets up the server should provide this information. (DMZ information may be applicable to the Oracle Identity Management Web Tier (line 25) and/or the Oracle Fusion Applications Web Tier (line 35) of the Component Assignment table.
- **Abstract Host Name:** If the DNS hostname used to address the host is different from the hostname defined at the operating system, add it to this column as the abstract hostname. The abstract hostname column can also be used to configure Oracle Fusion Applications with hostnames defined in the hosts file of the operating system (allowing the use of more generic names like `fadbhost` or `idmwebhost`) instead of the actual hostnames
- **IP Address**: Get this information from the network administrator. This column is informational only and is not used during the install process.
- **Operating System**: Use this column to specify the operating system of the host. Get this information from the network administrator. This column is informational only and is not used during the install process.
- **CPUs**: Enter the CPUs on the table. This column is informational only and is not used during the install process.
- **RAM**: Enter the amount of RAM available in this host. The command to retrieve RAM information depends on the operating system. This column is informational only and is not used during the install process.
- **DMZ**: The network administrator also knows whether the host is located in the DMZ; for more information about that decision, see Topology: Understand DMZ Requirements (page 3-14).

When the Topology table is complete, define which components reside on each host. Remember that most of this was specified during the sizing phase. To fill in the **Component Assignment** table:

- Check the Node numbers assigned to each host in the Topology table. For example, if the 3-node setup is used, the following assignments could have been made: Oracle Fusion Applications and Oracle Identity Management database = Node 1 Oracle Identity Managementmid tier and web tier = Node 2 Oracle Fusion Applications mid tier and web tier = Node 3
- Now it is possible to fill out the Component Assignment table by listing the appropriate node for each component. In the Basic 3-node example we are using, that would mean:
  - **FADB** and **IDMBDB**: Add the number **1** to the " **Node #**" column for the rows that contain the components FA DB and IDM DB.
  - **FADW** (Data Warehouse): Leave the **Node #** column for this component blank or add N/A.
  - **IDM Directory**, **IDM Identity and Access**, and **IDM Web Tier** : Add the number **2** to the " **Node #**" column for the rows that contain the Oracle Identity

Management mid tier and web tier components (IDM Directory, IDM Identity and Access, and IDM Web Tier).

- All remaining **FA-** components: Add the number **3** to the " **Node #**" column for the rows that contain the Oracle Fusion Applications mid tier and web tier components (all FA domains and the FA Web Tier). Adapt this example to match the environment, using the **HA/Scale-Out Node** column if needed.

3.4.3 Topology: Understand DMZ Requirements

Oracle Fusion Applications Provisioning has the option automatically to configure the Oracle Fusion Applications Web Tier for deployment on a Demilitarized Zone (DMZ). However, in some cases it is more advantageous to handle the DMZ and security in alternate ways. For example, if the enterprise already has a load balancer in the DMZ, it is not necessary to duplicate that function by installing the Oracle Fusion Applications Web Tier there.

Auto-deploying the Web Tier on a DMZ implies that:

- The Web Tier Middleware Home (binary files) and the OHS instance (including WebGate) are installed on separate storage from the shared Oracle Fusion Applications/ Oracle Identity Management storage.
- The Web Tier must be installed on a separate server.
- During Provisioning, the Web Tier install takes place separately from the main install, taking into consideration the fact that the DMZ is isolated in terms of storage, server and network.

When deciding whether to use this option, consider the following:

- **Requirements:** Is access from the outside network required, which would justify providing an entry point into Oracle Fusion Applications on the DMZ?
- **Maintenance:** Is it worth the maintenance for servers residing in the DMZ given the restricted server access and restricted access to storage, which can impact maintenance, patching, debugging, etc.?
- **Other Options:** Is there an existing infrastructure to enable external access (VPN, DMZ Web Servers, DMZ Load Balancers and Reverse Proxies, etc.)? Depending on the requirements, it may be possible to provision Oracle Fusion Applications without the Web Tier on the DMZ, simply using the existing infrastructure on the DMZ to forward requests to the Oracle Fusion Applications Web Tier.
- **Firewall Openings:** Placing the Oracle Fusion Applications Web Tier on the DMZ can have a bigger impact on required firewall openings, compared to placing the Web Tier on the internal network and using a DMZ Web Server/Proxy to forward requests to Oracle Fusion Applications, as the diagrams show.

Figure 3-3 Port Openings Required with Web Tier in the DMZ

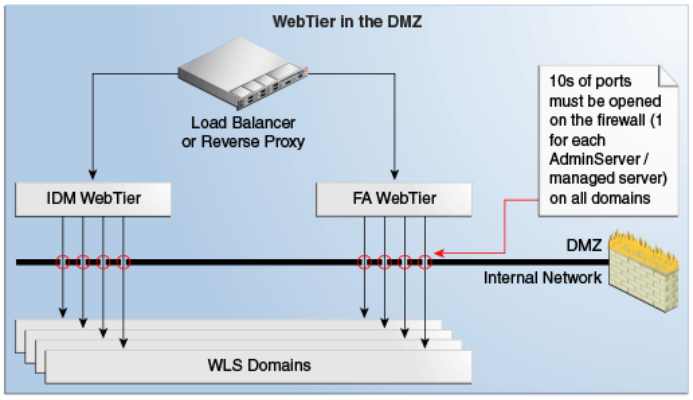
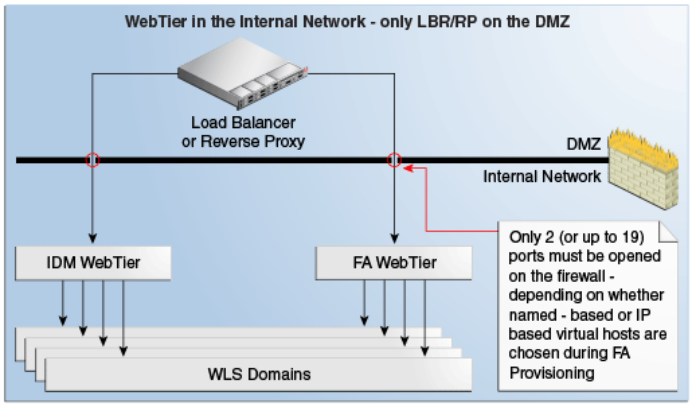


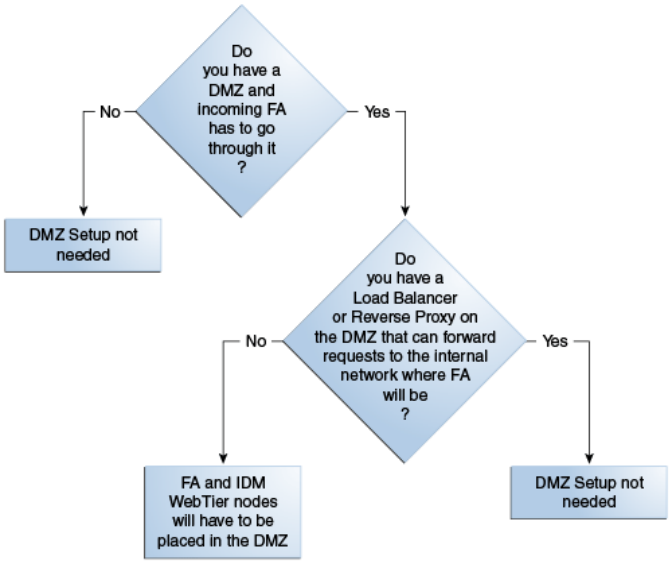
Figure 3-4 Port Openings Required when Web Tier is Not In DMZ



Note that from the Load Balancer/ Reverse Proxy going to the Web Tier, the number of port openings is small and can be minimized by selecting certain options during Provisioning. At a minimum, one port opening for Oracle Identity Management and one port opening for Oracle Fusion Applications are required.

On the other hand, going from the Web Tier to the Mid Tier, port openings would be required for each managed server that receives requests from the Web Tier. This number cannot be minimized, as Oracle Fusion Applications uses different ports for each managed server.

Figure 3-5 DMZ Decision Tree



3.4.3.1 Complete the DMZ Column in the Topology Table

Decide with the network administrator how to configure components in the DMZ based on the considerations above, and enter Yes or No as appropriate in the DMZ column for each node in the Topology table.

3.5 Next Steps

Proceed with Plan the Configuration of the Components of the Installation (page 4-1) planning tasks to complete the plan and the *Oracle Fusion Applications Installation Workbook*.

4

Plan the Configuration of the Components of the Installation

This section contains the following topics, each of which corresponds to a tab in the *Oracle Fusion Applications Installation Workbook*:

- Network- Virtual Hosts: Plan Network Configuration (page 4-1)
- Network-Ports: Plan Ports (page 4-14)
- Storage: Plan Storage Configuration (page 4-15)
- Database: Plan Database Configuration (page 4-23)
- Identity Management: Plan Oracle Identity Management Configuration (page 4-30)
- SSL and Certificates (page 4-33)
- Memory Requirements (page 4-34)
- What to Do Next (page 4-35)

4.1 Network- Virtual Hosts: Plan Network Configuration

Filling in the **Network-Virtual Hosts** tab of the *Oracle Fusion Applications Installation Workbook* entails understanding and deciding about a range of Oracle Fusion Applications concepts and conventions.

- **Internal vs External URLs:** See Understand Internal vs. External URLs (page 4-2), for information about to how Oracle Identity Management and Oracle Fusion Applications provisioning use these concepts.
- **Naming:** All parts of the network-related decisions involve choosing appropriate names for various endpoints. These are used throughout the installation, both for internal communication between Oracle Fusion Applications components and externally, to be viewed by users. Naming Conventions in Oracle Fusion Applications (page 4-2), gives important orientation on how to name endpoints throughout the installation.
- **Load Balancer:** Next, decide whether the availability and topology requirements demand the use of Load Balancers (LBR) or a Reverse proxy. For an introduction to the use of Load Balancers and Reverse proxy in Oracle Fusion Applications topologies, see Network Components (page 2-15).

  These decisions are further described in Plan Load Balancer Requirements (page 4-3)
- **Web Tier/HTTP Servers:** Make also decisions about the Web Tier. Oracle HTTP Servers (OHS) for Oracle Identity Management and Oracle Fusion Applications are installed on the Web Tier. Again, decide where on the network they reside and whether they are in the DMZ.

  This is described in Plan HTTP Server Requirements (page 4-9).

The Virtual Host Mode is a property of the Web Tier that can be name-based, port-based, or IP-based. These options are described in Define Web Tier Virtual Host Mode (page 4-9).

- **Virtual IPs (VIPs) for Administration and Managed Servers:** VIPs apply to all Enterprise topologies for Oracle Identity Management. For Oracle Fusion Applications, VIPs apply only to Enterprise-HA topologies. VIP overview information is described in Define VIPs for Administration and Managed Servers (page 4-10).
- When each of these subjects has been reviewed and decisions about them have been made, see Complete the Network-Virtual Hosts Tab of the Oracle Fusion Applications Installation Workbook (page 4-11).

4.1.1 Understand Internal vs. External URLs

Both the Oracle Identity Management and the Oracle Fusion Applications install procedures use the concept of *internal* and *external HTTP endpoints* as part of their service-oriented architecture. External HTTP endpoints are used by end-users to access the system and are used for the login screen, welcome pages, transaction pages, online help, and so on. Internal HTTP endpoints are not meant to be seen by end-users and instead are used for inter-component communication.

This distinction exists for security as well as topology reasons, allowing for maximum flexibility when deploying Oracle Fusion Applications on an enterprise environment. Since internal endpoints are not exposed externally, this provides a layer of security, and since internal traffic can easily be restricted to specific network segments, there is no need for extra security measures such as encryption. External HTTP endpoints allow for maximum topology flexibility: since they are the only external entry points for all Oracle Fusion Applications traffic, they are the only points in the topology that must be directly accessible to the external world; all other components can be located inside a firewall while still providing 100% access to end-users and other applications that integrate with Oracle Fusion Applications.

Both external and internal endpoints can be configured directly at the HTTP Server (in which case internal and external URLs will point at the HTTP Server) or can be configured at a Load Balancer or Reverse Proxy (in which case internal and external URLs will point at the LBR/RP and it in turn must be configured to point at the HTTP Server).

4.1.2 Naming Conventions in Oracle Fusion Applications

These conventions are used when naming URLs/endpoints within Oracle Fusion Applications, Oracle Identity Management, and in any load balancer that may be used.

4.1.2.1 Plan URL Naming Conventions

Naming conventions for network configuration are extremely important, since they define the URLs that are used by end-users to access the system, as well as defining all the internal "wiring."

When choosing hostnames for external HTTP endpoints, choose meaningful, easy-to-remember names, as they are used by end-users.

When choosing hostnames for servers, virtual IP addresses (VIPs), and internal HTTP endpoints, note the following:

- These names are used for all Oracle Fusion Applications-Oracle Fusion Applications addressing.
- Once chosen, these names cannot be changed!
- It is best to use environment-neutral (abstract) names, rather than names that include clues such as "test" or "prod" or "staging". Since the names are used to maintain internal wiring, they may be deployed on more than one environment (for example, to clone an installation). Choose environment-neutral names to avoid headaches later.

4.1.3 Plan Load Balancer Requirements

A Load Balancer (LBR) is required for scaled-out enterprise topologies. It is used to balance and route:

- External HTTP traffic from end-users to the Oracle Fusion Applications and Oracle Identity Management Web Tiers
- Internal HTTP traffic from the mid tiers to the Web Tiers (for both Oracle Fusion Applications and Oracle Identity Management)
- Internal LDAP (TCP) traffic from mid tiers to the Identity and Policy Stores (directory tier)
- Internal TCP traffic from the Oracle Fusion Applications mid tier to the Oracle WebCenter Content (UCM) socket listeners

If the topology is not scaled out, an LBR/Reverse proxy is not mandatory, but it is recommended for enterprise topologies with the following characteristics:

- External access requiring that traffic go through a DMZ with the Oracle Fusion Applications Web Tier located in the internal network
- The environment is not currently scaled out but may be in the future

For development environments, an LBR/RP is normally not required or used. In this case, the Provisioning framework can have the LBR option turned off which will set up the Web Tier (OHS) as the HTTP endpoint for Oracle Fusion Applications.

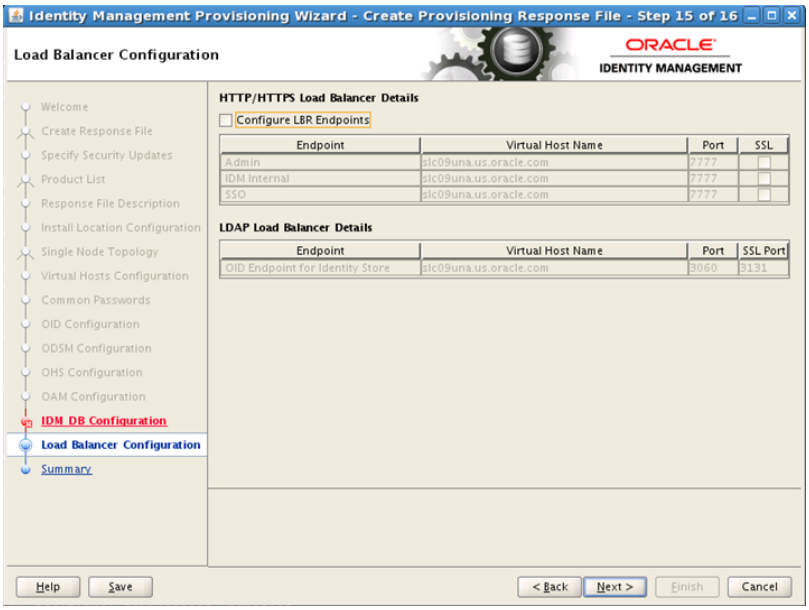
4.1.3.1 SSL Certificate Requirements

Both Oracle Identity Management and Oracle Fusion Applications terminate SSL connections at the LBR. Therefore, it is necessary to set up the appropriate SSL certificates on the LBR prior to starting the provisioning process. See SSL and Certificates (page 4-33).

4.1.3.2 How the Load Balancer Option Affects the Environment Setup

When Provisioning Oracle Identity Management

When running the Oracle Identity Management Provisioning Tool, the load balancer option is not available with the "Single-host" install. The other alternative, "EDG" topology, prompts for three IDM HTTP endpoints and three LDAP endpoints.



The requirements for this screen are described in the table below:

Configure LBR Endpoints: Select this option to configure the Admin, Internal Callbacks, and SSO LBR endpoints for a single-node topology.

In a three-node topology, the **Configure LBR Endpoints** option is selected by default. In a six-node enterprise deployment topology, the option is selected by default and cannot be deselected.

HTTP/HTTPS Requirements

Table 4-1 Load Balancer SSL Requirements for HTTP

Endpoint Type	SSL?	Description
Admin	Optional	Defines the host configuration on the Oracle HTTP Server (specifically the ServerName clause on the virtual host configuration `.conf` files)
Internal	Not allowed	Defines the URLs configured internally for the HTTP endpoints
SSO	Required	Main application entry point

LDAP Requirements

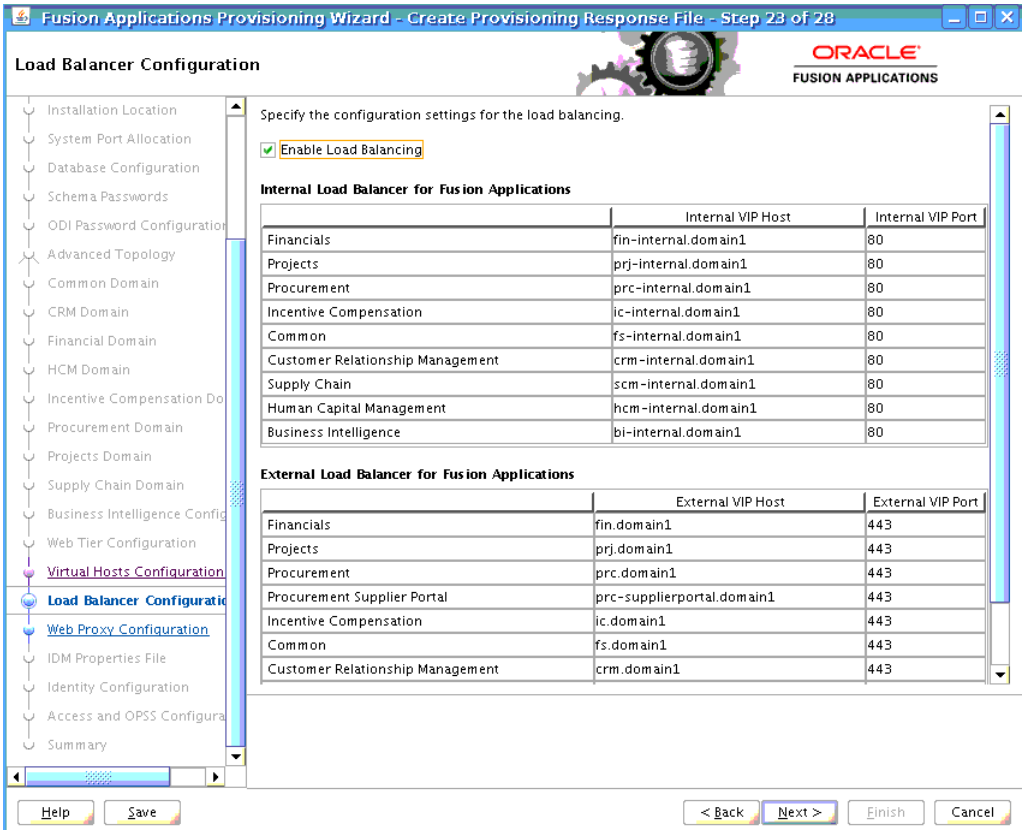
Table 4-2 Load Balancer SSL Requirements for LDAP Endpoints

Endpoint Type	Description
OID Endpoint	LDAP LBR endpoints are only used for the URLs configured internally for the LDAP endpoints.

All load balancer configuration must be performed by the network administrators; the Oracle Identity Management Provisioning process does not automate that or provide any specific settings for load balancer/reverse proxy configuration.

When Provisioning Oracle Fusion Applications

For Oracle Fusion Applications provisioning, the load balancer option is available for any topology. All load balancer configuration, adding internal and external virtual IP host and port, must be performed by the network administrators before starting provisioning Oracle Fusion Applications. The Oracle Fusion Applications Provisioning process does not install load balancer or provide any specific settings for load balancer/reverse proxy configuration. For more information about planning load balancer requirements, see Plan Load Balancer Requirements (page 4-3).



If selected, this setting affect:

- Virtual host configuration on the Oracle HTTP Server (more specifically the ServerName clause in the virtual host configuration `.conf` files)
- The URLs configured internally for the HTTP endpoints.

Whether or not the load balancer is selected has an affect on the SSL configuration at the OHS. This is discussed in SSL Certificate Requirements (page 4-3).

4.1.3.3 Network Placement of Load Balancers/Reverse Proxy

ITo use a load balancer/reverse proxy, it is important to consider where on the network it should be placed, and whether firewalls exist between it and the Oracle Fusion Applications mid tier and Web Tier.

For example, if a load balancer is placed in the DMZ and is configured for both internal and external Oracle Fusion Applications traffic, this may be undesirable for security reasons. (In this case, internal traffic from the Oracle Fusion Applications and Oracle Identity Management mid tiers go through the DMZ to get to the respective web tiers). Additionally, firewall ports may have to be opened for traffic from the internal network to the DMZ, and TCP traffic (for LDAP and UCM) are going through the DMZ.

In this case, placing an additional load balancer on the internal network is recommended for internal traffic (HTTP and TCP), to prevent it from going through the DMZ.

The following diagrams show both scenarios in more detail:

Figure 4-1 Load Balancer Placed Outside the internal Network

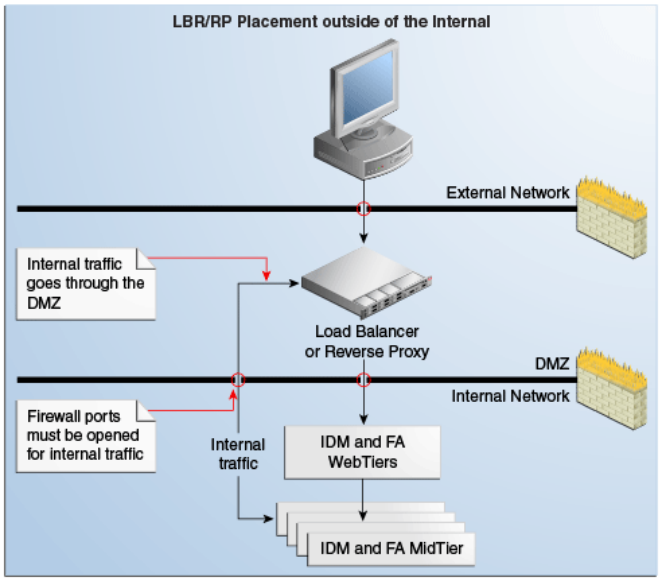
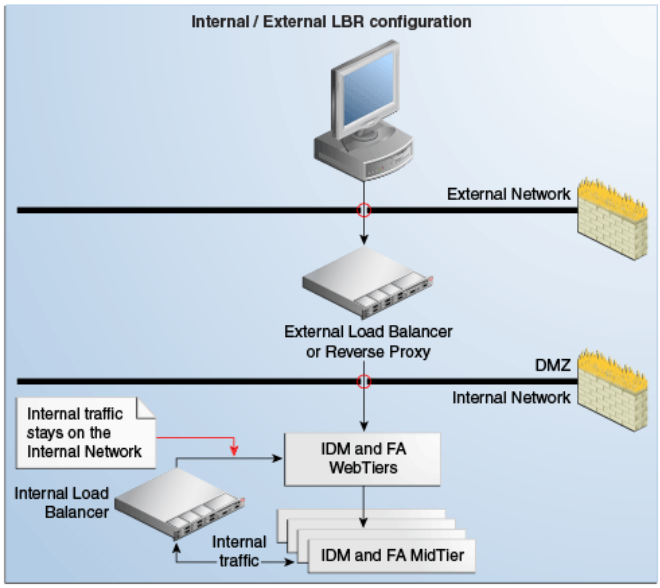
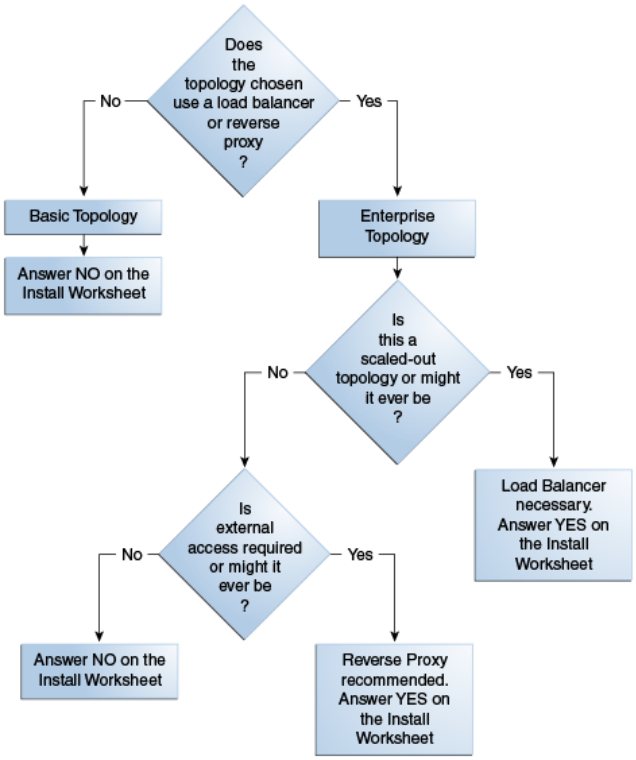


Figure 4-2 Internal/External LBR Configuration



Follow the decision tree to plan the usage and placement of a load balancer, and to fill out the *Oracle Fusion Applications Installation Workbook* appropriately. Enter decisions on the **Environment** tab, **Environment Info** table, *Load Balancer/Reverse proxy* row.

Figure 4-3 Load Balancer/Reverse Proxy Decision Tree



4.1.3.4 Load Balancer Feature Requirements

Several virtual servers and associated ports must be configured on the load balancer for different types of network traffic and monitoring. These should be configured to the appropriate real hosts and ports for the services running. Also, the load balancer should be configured to monitor the real host and ports for availability so that the traffic to these is stopped as soon as possible when a service is down. This ensures that incoming traffic on a given virtual host is not directed to an unavailable service in the other tiers.

If the topology uses a load balancer, it must 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
- **Port monitoring** (HTTP and HTTPS)
- **Resource monitoring / port monitoring / process failure detection:** The load balancer must be able to detect service and node failures (through notification or some other means) and to stop directing non-Oracle Web traffic to the failed node. If the external load balancer has the ability to automatically detect failures, it should be used.
- **Ability to Preserve the Client IP Addresses:** The load balancer must have the capability to insert the original client IP address of a request in an `X-Forwarded-For` HTTP header to preserve the Client IP Address.
- **Virtual servers and port configuration:** Ability to configure virtual server names and ports on the external load balancer.

Note that there are also requirements for the virtual server names and ports, as follows:

- The virtual server names must be associated with IP addresses and be part of the DNS. Clients must be able to access the external load balancer through the virtual server names.
- The load balancer should allow configuration of multiple virtual servers, and for each virtual server, the load balancer should allow configuration of **traffic management on more than one port**. For example, for Oracle WebLogic Clusters, the load balancer must be configured with a virtual server and ports for HTTP and HTTPS traffic.

The last list of features are recommended, though not required for every topology:

- It is recommended to configure the load balancer virtual server to return immediately to the calling client when the back-end services to which it forwards traffic are unavailable. This is preferred over the client disconnecting on its own after a time-out based on the TCP/IP settings on the client machine.
- SSL termination is used in the Oracle Identity Management EDG topology as well as all Oracle Fusion Applications topologies. This is the ability to terminate SSL requests at the load balancer and forward traffic to the back-end real servers using the equivalent non-SSL protocol. (For example, the load balancer must be able to forward HTTPS requests as HTTP.)

- Configure the virtual servers for the Directory Tier in the load balancer with a high value for the connection time-out for TCP connections. This value should be more than the maximum expected time over which no traffic is expected between Oracle Access Manager and the Directory Tier.
- It is recommended to configure the load balancer to be in fault-tolerant mode.
- SSL acceleration is recommended, but not required. This refers to off-loading the public-key encryption algorithms involved in SSL transactions to a hardware accelerator.
- Have the ability to add `WL-Proxy-SSL: true` to the HTTP Request Header. Some load balancers do this automatically.

4.1.4 Plan HTTP Server Requirements

Both Oracle Identity Management and Oracle Fusion Applications Provisioning install their own Oracle HTTP Server, which is the primary endpoint for all HTTP traffic, both internal and external. While each provisioning tool may configure its HTTP Server slightly differently, it is important that the planning phase take both into consideration when deciding:

- Naming convention for virtual hosts
- DMZ placement
- Port usage

Note the following default setups:

- Oracle Identity Management Provisioning requires hostnames for only the LBR endpoint. The OHS listeners and name-based virtual hosts are set up with wildcards. Oracle Fusion Applications, however, always requires hostnames for the OHS endpoints even when using an LBR, and its virtual hosts are set up using those hostnames. This has implications when choosing name-based vs. IP or port-based virtual hosts for Oracle Fusion Applications.
- Both Oracle Identity Management and Oracle Fusion Applications Provisioning terminate SSL connections at the LBR (external HTTP endpoints only). This means that when the LBR option is selected during provisioning, the OHS virtual hosts are not configured with an SSL listener and therefore the connection between the LBR and OHS is always non-SSL and SSL certificates must be set up at the LBR. On the other hand, if the LBR option is NOT selected, the consequences differ.

  For Oracle Identity Management, only the "Basic" topology allows no LBR. In this case, OHS is configured with no SSL for all internal, external and admin virtual hosts.

  For Oracle Fusion Applications Provisioning, the OHS is set up with SSL on the external virtual hosts, which requires installing SSL certificates.

4.1.4.1 Define Web Tier Virtual Host Mode

Oracle Identity Management Provisioning always uses name-based virtual hosts.

Oracle Fusion Applications Provisioning allows to choose a preferred method:

- Port-based
- Name-based

- IP-based

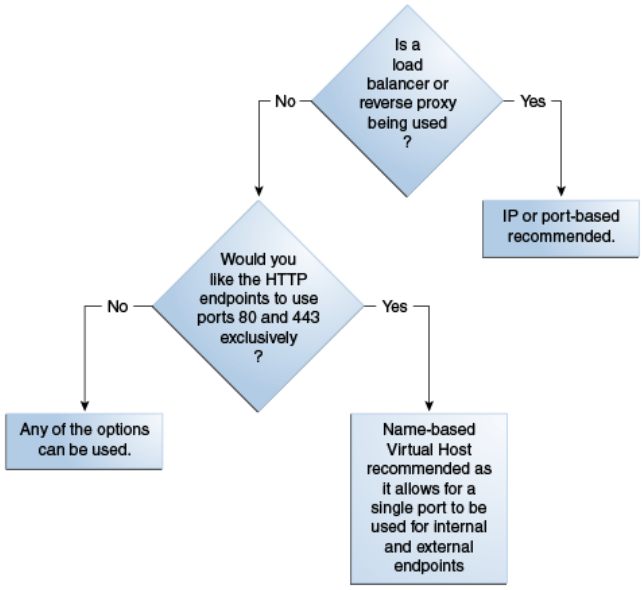
The choice depends on whether a load balancer is used or not, and the hostname/port convention desired for endpoints.

If a load-balancer is used, then IP- or Port-based mode is used.

The following table shows the parameters.

Virtual Host Configuration	Description	# of Ports	# of Host Names
Port-based	Based on the incoming port	2 per domain (one internal and one external)	No virtual hosts are used
Name-based	Based on the incoming host name	2: one internal (non-SSL) and one external (SSL)	2 per domain (one internal and one external)
IP-based	Based on IP:Port combination	At least 1 and up to 2 per domain (one internal and one external)	At least 1 and up to 2 per domain (one internal and one external)

Figure 4-4 Choosing Virtual Host Mode; Name-, Port- or IP-Based



4.1.5 Define VIPs for Administration and Managed Servers

A virtual IP address is an unused IP Address which belongs to the same subnet as the host's primary IP address. It is assigned to a host manually and Oracle WebLogic Managed servers are configured to listen on this IP Address. In the event of the failure of the node where the IP address is assigned, the IP address is assigned to another node in the same subnet, so that the new node can take responsibility for running the managed servers assigned to it.

4.1.5.1 Define VIPs for Oracle Identity Management

The following is a list of the Virtual IP addresses required by Oracle Identity Management:

- **IDMDomain AdminServer:** In Enterprise deployments, the WebLogic Administration Server must be able to continue processing requests even if the host on which it resides fails. A virtual IP address should be provisioned in the Application Tier, so it can be bound to a network interface on any host in the Application Tier. The WebLogic Administration Server is configured later to listen on this virtual IP address. The virtual IP address fails over along with the Administration Server from IDMHOST1 to IDMHOST2, or vice versa.

4.1.5.2 Define VIPs for Oracle Fusion Applications

Configure the Administration Server and the Managed Servers to listen on different virtual IPs. Oracle Fusion Applications VIPs are required in Enterprise-HA topologies to configure specific components:

- Virtual IPs for AdminServer are needed for every domain to configure AdminServer in active-passive mode. These VIPs are shared across primary and secondary hosts, depending on where the Administration Server is running.
- Virtual IPs for all Oracle SOA Suite servers in every domain, and Oracle Business Intelligence servers in the Oracle Business Intelligence domain are needed to support server migration. These components are implemented in active-active mode, so these VIPs are needed for primary and secondary hosts.

4.1.6 Complete the Network-Virtual Hosts Tab of the Oracle Fusion Applications Installation Workbook

The Network-Virtual Hosts tab includes the following tables:

- Complete the Web Tier Virtual Host Mode Table (page 4-11)
- Complete the FA Web Tier Virtual Hosts Table (page 4-12)
- Complete the IDM Web Tier Virtual Hosts Table (page 4-13)
- Complete the HTTP LBR Endpoints Table (page 4-13)
- Complete the LDAP Endpoints Table (page 4-13)
- Complete the UCM LBR Endpoint Table (page 4-13)
- Complete the AdminServer Virtual Hosts/VIPs Table (page 4-14)
- Complete the Managed Server Virtual Hosts/VIPs Table (page 4-14)

4.1.6.1 Complete the Web Tier Virtual Host Mode Table

Select the appropriate virtual host mode (name-, port-, or IP-based), as determined in Define Web Tier Virtual Host Mode (page 4-9)

4.1.6.2 Complete the FA Web Tier Virtual Hosts Table

Completing this table depends on the Virtual Host Mode chosen (Define Web Tier Virtual Host Mode (page 4-9)). Each row of the table is described in FA Web Tier Virtual Hosts Table Rows Defined (page 4-12); the mode-based usage is as follows:

Port-Based

- **Internal and External Hostnames:** They are not used. Leave them blank or mark N/A.
- **Ports:** The *Oracle Fusion Applications Installation Workbook* provides the default ports to be used; they are the same as the defaults presented on the Provisioning Wizard. It is recommended to keep the defaults (see Use Default vs. Custom Port Numbers (page 4-14)).

Name-Based

- **Internal and External Hostnames:** Select the external and internal hostnames to be used for the Oracle Fusion Applications Web Tier. The *Oracle Fusion Applications Installation Workbook* provides the defaul hostnames as presented on the Provisioning Wizard. See Plan URL Naming Conventions (page 4-2). **Note**: this virtual host mode is not recommend for use with a load balancer, as indicated in Define Web Tier Virtual Host Mode (page 4-9).
- **Ports:** In name-based mode, do not use the **Internal Port** or **External Port** columns. Make them blank or mark them N/A. The reason is that in this mode, the default ports defined for the Oracle Fusion Applications HTTP Server are used by the Provisioning Wizard as follows:
  - **Internal Port:** In the *Oracle Fusion Applications Installation Workbook* open the **Network - Ports** tab, then **Fusion Applications Port Numbers**, then *FA Oracle HTTP Server*.
  - **External Port:** In the *Oracle Fusion Applications Installation Workbook* open the **Network-Ports** tab, then **Fusion Applications Port Numbers** , then *FA Oracle HTTP Server SSL*.

IP-Based

This mode lets select both port and hostname and has the defaults as presented on the Provisioning Wizard.

- **Internal and External Hostnames:** Select the external and internal hostnames to be used for the Oracle Fusion Applications Web Tier. See Plan URL Naming Conventions (page 4-2).
- Ports: It is recommended to keep the default port numbers, as mentioned in Use Default vs. Custom Port Numbers (page 4-14).

In all three modes, the **IP Address** column should contain the IP address of the host that runs the Oracle Fusion Applications Web Tier. They are normally all the same.

4.1.6.2.1 FA Web Tier Virtual Hosts Table Rows Defined

A general description of each row is below. How to use them depends on the Virtual Host Mode, above.

- **FA Web Tier Internal Name:** The internal and external names point to the Oracle Fusion Applications Web Tier host or hosts. It can be advantageous/more user-friendly to assign names that indicate their use; for example, the Financials preceded by `fin-ext` (external) or `fin-int` (internal), as shown in the defaults. If a name that differs from the default structure is assigned, it needs to be added to the `/etc/hosts` file.
- **Internal Port:** The default ports are provided by the Provisioning Wizard and are pre-entered in the *Oracle Fusion Applications Installation Workbook*. Change only if necessary for the enterprise. Different ports must be assigned to each product.
- **FA Web Tier External Name:** The internal and external names point to the Oracle Fusion Applications Web Tier host or hosts. It can be advantageous/more user-friendly to assign names that indicate their use; for example, the Financials preceded by `fin-ext` (external) or `fin-int` (internal), as shown in the defaults. If a name that differs from the default structure is assigned, it needs to be added to the `/etc/hosts` file.
- **External Port:** The default ports are provided by the Provisioning Wizard and are pre-entered in the *Oracle Fusion Applications Installation Workbook*. Change only if necessary for the enterprise. Different ports must be assigned to each product.
- **IP Address:** Provide the IP address of the Oracle Fusion Applications Web Tier.

4.1.6.3 Complete the IDM Web Tier Virtual Hosts Table

The Oracle Identity Management Web Tier hosts must share a common port. The IP address points at the Oracle Identity Management Web Tier.

External, Internal and Admin hostnames cannot be chosen. They are default to the hostname defined in the **Topology** tab, then **Topology** table for the component **IDM Web Tier**, and are grayed out on the Provisioning Wizard.

4.1.6.4 Complete the HTTP LBR Endpoints Table

Select the external and internal hostnames to be used for the HTTP Endpoints at the Load Balancer or Reverse proxy. The *Oracle Fusion Applications Installation Workbook* provides the default hostnames as presented on the Provisioning Wizard. See Plan URL Naming Conventions (page 4-2).

It is recommended to keep the default port numbers, as mentioned in Use Default vs. Custom Port Numbers (page 4-14).

4.1.6.5 Complete the LDAP Endpoints Table

Enter the abstract hostname (or real hostname if not using an abstract one) for the node where the **IDM Directory** component in the Topology tab was assigned. The ports are predefined and should only be changed if required by the enterprise. When running the Oracle Identity Management Provisioning Wizard, these values are automatically pre-populated and greyed out; they cannot be changed.

4.1.6.6 Complete the UCM LBR Endpoint Table

If high availability is used, then an entry in the load balancer is needed to distribute the load among UCM servers.

- **Hostname:** The load balancer entry here is configured to distribute traffic among UCM managed servers in the UCM cluster. Enter the load balancer virtual host name used for UCM distribution.
- **Port:** Only change the default port if required by your enterprise. Port must be configured for TCP traffic.

4.1.6.7 Complete the AdminServer Virtual Hosts/VIPs Table

The Oracle Identity Management-related entry is needed for all Enterprise topologies. The Oracle Fusion Applications entries are only needed when planning for Enterprise high availability (HA). Define only entries for the licensed products.

See Define VIPs for Oracle Identity Management (page 4-11) for general discussion.

- **Virtual Host Name:** For each domain, define a Virtual Hostname. The network administrator will later need to set these up in DNS.
- **Virtual IP Address:** For each domain, define a Virtual IP.

4.1.6.8 Complete the Managed Server Virtual Hosts/VIPs Table

Like the Admin Server entries above, the Oracle Identity Management-related entries are needed for all Enterprise topologies. The Oracle Fusion Applications entries are only needed when planning for Enterprise high availability (HA). Define only entries for the licensed products. For each managed server in the table, define a virtual host name and IP for each scale-out node.

4.2 Network-Ports: Plan Ports

Default ports are provided by Oracle Identity Management and Oracle Fusion Applications Provisioning, and are listed in the *Oracle Fusion Applications Installation Workbook*. The network administrator of the enterprise determines whether these can be used or should be changed; enter accordingly.

4.2.1 Default vs. Custom Port Numbers

The Provisioning tools include default port numbers for all components in their Wizards. While it is possible to change these ports to any other value, keeping the defaults guarantees consistency across different installations or environments and may be helpful when following product documentation, since it uses these default ports in its reference architectures and configuration examples.

When changing port numbers from their defaults, pay special attention to potential conflicts for components running on the same server with the same port. While the installers verify and warn about any potential port conflicts, ensuring there are no conflicts before installation helps providing a more predictable and smoother installation experience.

4.2.1.1 Complete the Network-Ports Tab of the Oracle Fusion Applications Installation Workbook

The Network-Ports tab in the *Oracle Fusion Applications Installation Workbook* lists all ports that can be changed in the Oracle Identity Management and Oracle Fusion

Applications provisioning tools and includes default values. Change the defaults only if required by existing conflicts in the enterprise's network setup.

4.3 Storage: Plan Storage Configuration

Storage planning refers to all planning activities related to:

- Determining how much storage is needed for Oracle Fusion Applications during installation, runtime, and for upgrade
- Defining the file system directories where the software is installed
- Defining the type of storage to be used (local, shared), depending on the requirements of both Oracle Fusion Applications and the enterprise.

This section focuses on software installation and initial use only. It does not address long-term capacity planning for the Oracle Fusion Applications environment or space management (e.g. periodic purging of logs).

4.3.1 Recommended Minimum Disk Space

It is recommended to maintain the minimum amount of free disk space specified in Table 4-3 (page 4-15) to accommodate the initial installation, and a reasonable number of incremental backups, daily or weekly thereafter, and subsequent upgrade activities for future releases. If the environment does not meet the minimum requirements, a warning message is recorded in the provisioning log. Continue with the installation but may encounter insufficient disk space issues.

In Table 4-3 (page 4-15), the Installation/Upgrade Storage column represents the free disk space required for completing installation and upgrade. The Base Storage column is free disk space required to maintain a working application environment which takes into account of storage growth due to transition data, and retention of diagnostic logs for administration and troubleshooting.

Table 4-3 Recommended Minimum Disk Space

Host	Base Storage (GB)	Installation/Upgrade Storage (GB)
Oracle Fusion Applications Web Tier Host	50	50
Oracle Fusion Applications Provisioning Host	500	300
Oracle Fusion Applications Database Host	600	200
Oracle Identity Management Web Tier Host	50	50
Oracle Identity Management Provisioning Host	200	100
Oracle Identity Management Database Host	200	100

4.3.2 Directory Storage Requirements

Table 4-4 (page 4-16) outlines space recommendations for various components and directories, several of which are detailed below. It does not include the storage required for storing the Oracle Fusion Applications media packs and the provisioning repository.

- Shared Storage (page 4-17)
- Local Storage (if used) (page 4-18)
- DMZ Local Storage (if used) (page 4-18)
- Database Storage (page 4-18)
- Temporary Files Created During Installation (temp directory) (page 4-19)

Table 4-4 Planning Storage Size

Directory Created	Description	Storage Size Usage Estimate
`DB HOME/oradata`	Both the Oracle Fusion Applications transaction database and the Oracle Identity Management database(s) may be on one machine or separate machines. On the same machine, they can share a DB Home. Otherwise, there is a DB Home on each database machine. DB Home includes database directory files and configuration files. `/oradata` contains the table spaces and logs.	The Oracle Fusion Applications transaction database DB Home requirement: 50 GB. The Oracle Identity Management DB Home requirement: 50 GB. `/oradata` for FA: 200 GB `/oradata` for IDM: 75 GB
`IDM_BASE (shared), IDM_CONFIG (shared), IDM_LOCAL_CONFIG (local)`	`IDM_BASE` contains the Oracle Identity Management product directory. It remains relatively unchanged. It must use shared storage and may use local storage additionally.	20 GB
`IDMLCM_HOME (shared)`	`IDMLCM_HOME` contains the Oracle Identity Management Configuration directory which stores the configuration files and is modified as a result of the provisioning process. It must use shared storage.	25 GB
`FAPROV_HOME (shared)`	A directory created just for the Oracle Fusion Applications installing the provisioning framework. Once Oracle Fusion Applications is installed, it can be deleted if there is no further usage after provisioning.	10 GB

Table 4-4 (Cont.) Planning Storage Size

Directory Created	Description	Storage Size Usage Estimate
APPLICATIONS_BASE (shared), APPLICATIONS_CONFIG (shared), APPLICATIONS_LOCAL_CONFIG (local)	APPLICATIONS_BASE is the top-level directory containing the Oracle Oracle Fusion Applications executable. APPLICATIONS_CONFIG contains the instance details for Oracle Fusion Applications. It must use shared storage and may use local storage (APPLICATIONS_LOCAL_CONFIG) additionally.	120 GB shared
/mnt/hwrepo (shared)	A required directory for Oracle Fusion Human Capital Management (Oracle Fusion HCM) which is checked by the Provisioning Wizard in the pre-verify stage of Oracle Fusion Applications provisioning. It has a large storage requirement if the Workforce Reputation Management feature is planned to be used. Ignore the warning if Workforce Reputation Management feature is not used.	1 TB
/tmp (local)	For each provisioning host, ensure that there is at least 4 GB free space available for /tmp before installing Oracle Fusion Applications on the provisioning hosts. If the disk space for /tmp is low, performance issues are encountered. In this case, make disk space available or restart the hosts to clean up /tmp.	4 GB/host

4.3.2.1 Shared Storage

Shared storage space must be made available for use by all nodes running Oracle Fusion Applications and Oracle Identity Management. The shared storage space normally holds:

- The provisioning repository (see Installation Files and Provision Repository (page 4-18)).
- All of the Oracle Identity Management and Oracle Fusion Applications software (including their provisioning frameworks). An exception: some of the software are stored elsewhere if **Local Config** is chosen during provisioning (see Local Storage (if used) (page 4-18)) or select the DMZ option (see DMZ Local Storage, if used (page 4-18)).
- Temporary backup files (see Temporary Backup Files (page 4-18)).
- The hwrepo directory (HCM only; see The hwrepo Directory (page 4-18)).

For more information about the directory structure of the shared storage please refer to Oracle Fusion Applications Directory Structure (page 2-24).

4.3.2.1.1 Installation Files and Provision Repository

The Oracle Fusion Applications software from Oracle eDelivery is downloaded in the form of several .zip files. Extract these into a directory called the provisioning repository (REPOSITORY_LOCATION), which contains the `installers` directory containing all installers required by Oracle Fusion Applications. This repository must reside on shared storage. Space is needed for both the zip files and the extracted repository; delete or move the zip files after the repository is created.

See Installation Repository (page 2-24).

4.3.2.1.2 Temporary Backup Files

The installation procedures described in this guide prompt to take temporary backup files at several milestones of the installation process. Plan to make enough space available to store those backups files for the duration of the installation process.

4.3.2.1.3 The hwrepo Directory

If the Oracle Fusion Human Capital Management (Oracle Fusion HCM) application offerings are being provisioned, namely Workforce Development and Workforce Deployment, and Workforce Reputation Management feature is planned to be used, create a directory named `/mnt/hwrepo` on a shared disk for the provisioning hosts. If this directory is not set up, a warning message is displayed in the provisioning log during the pre-verify phase when the offerings for provisioning are selected. Proceed with provisioning the environment and mount the shared disk after provisioning is complete and before starting using the Workforce Reputation application.

4.3.2.2 Local Storage (if used)

If desired, certain runtime and configuration directories can be stored in local storage instead of shared storage, for both Oracle Identity Management and Oracle Fusion Applications components. See Local Storage Considerations (page 4-21).

For more information about the directory structure of the local storage, see Oracle Fusion Applications Directory Structure (page 2-24).

4.3.2.3 DMZ Local Storage (if used)

If desired, the Middleware Home for OHS and Webgate, as well as other configuration files, can be stored separately from the shared storage, for use in a DMZ. See Topology: Understand DMZ Requirements (page 3-14) for information on how to choose whether to use the DMZ option in Oracle Identity Management and Oracle Fusion Applications provisioning wizards. If used, plan space for the DMZ servers.

For more information about the directory structure of the local storage, see Oracle Fusion Applications Directory Structure (page 2-24).

4.3.2.4 Database Storage

Initial database storage requirements are provided in Table 4-4 (page 4-16), but consider short and long-term storage requirements during the planning phase. Storage

is needed for both the Oracle database binaries and the data files and other configuration files.

If using Real Application Clusters (RAC) for high-availability, the database storage must be shared among all nodes for each database. Automatic Storage Management (ASM) is the only supported database storage for RAC.

4.3.2.5 Temporary Files Created During Installation (temp directory)

Oracle Fusion Applications uses the system temporary directory to store certain files used during the install, and that space is required throughout the installation process. Since these files may also be used post-installation for patching or upgrade processes, it is recommended to assign that space to the system temp directory permanently.

4.3.3 oraInventory Planning

The oraInventory is the location where the Oracle Universal Installer stores information about all the Oracle software products installed on all `ORACLE_HOMES` and it is essential for lifecycle events such as applying patches, upgrades, and de-installing components. The following components require an oraInventory:

- Oracle Database
- Oracle Identity Management Provisioning tool
- Oracle Identity Management components
- Oracle Fusion Applications Provisioning tool
- Oracle Fusion Applications components
- Oracle HTTP Server (separate oraInventory when installed on a DMZ)

For more information about oraInventory (also called OUI Inventory in some references), see *Oracle Universal Installer (OUI) Inventory* in the *Oracle Fusion Applications Patching Guide*.

When planning the location of the oraInventory directories, consider the following:

- The oraInventory must be accessible from all the nodes that run software installed against it. Therefore, when Oracle Fusion Applications is installed on multiple nodes, the oraInventory for Oracle Fusion Applications must be located on shared storage. The same applies to the oraInventory for Oracle Identity Management. The database oraInventory locations are usually maintained separately from Oracle Fusion Applications and Oracle Identity Management oraInventory; shared storage is not applicable.
- Having a single oraInventory across all Oracle Fusion Applications components brings the advantage of centralized management and eliminates guesswork when applying patches. By default, the central oraInventory includes a known file (`oraInst.loc`) that provides the location of the central oraInventory to Oracle Fusion Applications lifecycle management utilities such as patching, upgrading, or cloning tools.

For oraInventory planning, please define the inventory location for each of the components below:

- Oracle Identity Management Provisioning Framework
- Oracle Fusion Applications Provisioning Framework

- Oracle Fusion Applications
- Oracle Identity Management
- Oracle Fusion Applications database
- Oracle Identity Management database
- OID database
- Oracle Fusion Applications Data Warehouse database

Define also whether each inventory is **central** or **local**:

- **Central:** The `/etc/oraInst.loc` file defines a server-wide location for a single inventory. When this file is present, Oracle installers/provisioning tools do not prompt for an inventory location and use the one defined in this file instead. This works well if the same Inventory path is used for all components. If the `/etc/oraInst.loc` file is not present, the first time an installer is run a central inventory location and group owner are requested. The installer creates the file automatically in the `/etc` directory, which requires root access. Copy manually that file to all servers using that software.
- **Local:** No `/etc/oraInst.loc` file should be present. In this case, during install it might necessary to:
  1. Specify an inventory location and group owner when prompted by an installer, and check the option to make it a local inventory. Be sure to use a path in shared storage so it is visible to all servers running that software. No root access is required in this case. The installer creates the local inventory automatically in the specified location and adds an `oraInst.loc` file pointing to that inventory in the `ORACLE_HOME` of the product.
  2. When the local inventory and oraInst.loc file have been created by the installer, use the option `-invPrtLoc` to specify the oraInst.loc file location when invoking the installers/provisioning tools.

4.3.4 Plan Directory Structure and Naming Conventions

Ensure enough shared storage available and is accessible, and enough local storage is available if using that option. When running the Provisioning Wizard, in addition to oraInventory, it is necessary to plan for the locations listed in the table below:

Directory Conventions:

- Directory names should not contain spaces.
- Directory structure is maintained across sources and targets, so use environment-neutral directory names and make them unique enough to guarantee this naming is available on a potential subsequent clone target.
- All the directories must be owned by the installing (operating system) user. By convention, most Oracle software installation are done with the operating system user called "`oracle`".

4.3.5 Shared Storage Considerations

Oracle Fusion Applications and Oracle Identity Management use shared storage to make the binary files, configuration files, and other files available to all its Mid Tier nodes (and Web Tier nodes, if not using the DMZ option). The shared storage should

be mounted at the exact same location for each Mid Tier node (and Web Tier nodes, if not using the DMZ option).

Shared storage **must** also be used for the:

- Provisioning repository
- Oracle Identity Management provisioning framework
- Oracle Fusion Applications provisioning framework
- `hwrepo` directory
- Database when using RAC

Shared storage may also be used temporarily during the installation process to hold temporary backup files or other files used during the installation process.

Additional consideration for the shared storage:

- Shared storage can be a Network Attached Storage (NAS) or Storage Area Network (SAN) device.
- NAS storage is only supported on NetApp and zFS.
- It is possible to set up separate volumes of shared storage, one for Oracle Fusion Applications and another for Oracle Identity Management. The Oracle Fusion Applications shared storage does not have to be mounted or visible to the Oracle Identity Management nodes, and vice-versa.
- If provisioning Oracle Identity Management and Oracle Fusion Applications on a single node, it is possible to use a local disk for shared storage, since it must only be visible to one node.
- The shared drive such as, Network File System (NFS) or Common Internet File System (CIFS) must support file locking. For NFS Version 3 and NFS Version 4, the advisory locking must be configured for the NFS mount. This applies to all UNIX platforms.

4.3.6 Local Storage Considerations

Both Oracle Identity Management and Oracle Fusion Applications Provisioning offer the option of using local storage to run Managed Servers and local instances. This storage location is a networked (local) disk on the host, visible only to the processes running on that host, which may offer better performance than shared storage.

When deciding whether or not to use local configuration take the following into account:

- Speed of local storage vs. shared storage
- Disk space available on the local storage
- IT processes (e.g. backup, storage mirroring) that require additional maintenance due to the added drive location and its accessibility from the local server only.

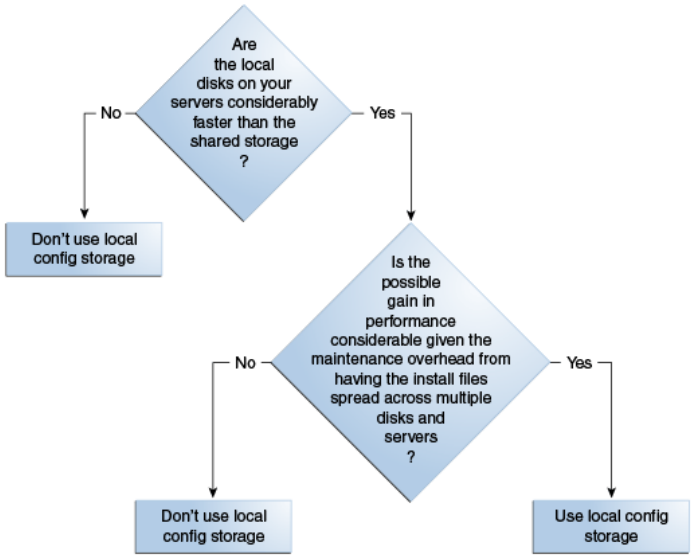
If the Local Config Storage option is used, the following directories are created:

Installation	Location	Sub-Directories	Includes
Oracle Identity Management	IDM_LOCAL	/instances /domains	All instance configuration files (for OID, ODSM, OHS) All managed server files
Oracle Fusion Applications	FA_LOCAL	/applications /BIInstances /domains	BI Instance configuration files UCM configuration files All managed server files

4.3.6.1 Local Config Storage Decision Tree

The decision diagram outlines the key choice points when choosing whether to use the Local Storage Config option available in the Oracle Fusion Applications and Oracle Identity Management Provisioning Wizards.

Figure 4-5 Local Storage Decision Tree



4.3.7 Complete the Storage Tab of the Oracle Fusion Applications Installation Workbook

To complete the **Shared Storage** table:

- **Mount Point:** The file system mount point for the Oracle Fusion Applications or Oracle Identity Management shared storage.
- **OS User Owner:** The operating system user of the installation owner (e.g. oracle).
- **OS Group Owner:** The operating system group of the installation owner (e.g. orainstall).
- **NFS Parameters (UNIX only):** NFS parameters as defined in `/etc/fstab`.

To complete the **Install Directories** Table:

- Enter the appropriate install directories, as described in Plan Directory Structure and Naming Conventions (page 4-20).

To complete the **Inventories** Table:

Complete the Inventory path with the desired path for the inventories. See oraInventory Planning (page 4-19).

To complete the **Temporary Storage** Table:

- **Provisioning Repository:** location for the provisioning repository.
- **Installer Directory:** when the Oracle Fusion Applications package is downloaded from e-delivery, a multiple zip file is received. When this file is unzipped, it creates the top-level directory called `Installers`.
- **JAVA_HOME:** location of the JAVA_HOME.
- **Temporary Backup Location:** plan space to back up during the provisioning process. When everything is installed and validated, delete this.

4.4 Database: Plan Database Configuration

An Oracle Fusion Applications environment has, at minimum, two databases: one for Oracle Identity Management (IDMDB) and another one for Oracle Fusion Applications transactions (FADB). Since these two databases are subject to different patching and maintenance requirements, it is recommended that they are installed on separate `ORACLE_HOMEs`.

Optionally, a database for the Data Warehouse is used to install Oracle BI Applications (DWDB).

Oracle Identity Management Provisioning also permits a separate dedicated database for OID (OIDDB). This database can be installed on the same `ORACLE_HOME` as the IDMDB.

The following table summarizes the database requirements for Oracle Fusion Applications

Database	Purpose	Mandatory	Separate ORACLE_HOME Recommended
FADB	Oracle Fusion Applications transactional database	yes	yes
IDMDB	Oracle Identity Management database	yes	yes
OIDDB	Oracle Identity Management (OID only)	no	no
DWDB	Data Warehouse for Business Intelligence	no	yes

4.4.1 RAC vs. Single Instance Planning

For environments using the Basic or Enterprise (non-HA) topologies, a single-instance database is used.

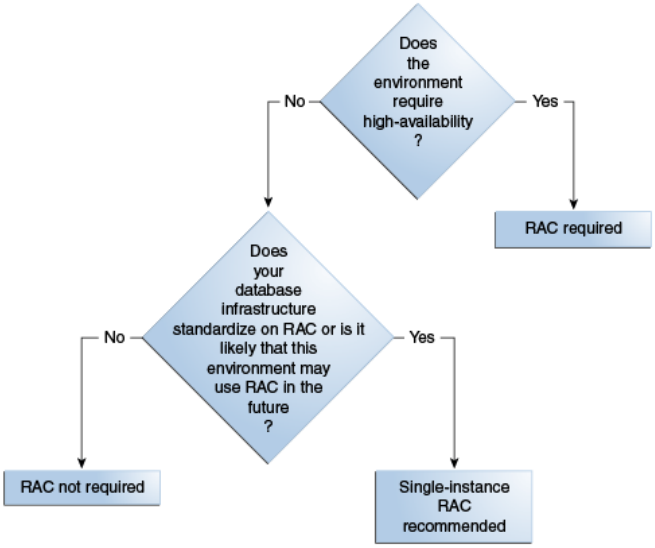
For environments with High Availability requirements, Oracle Fusion Applications supports the use of Oracle Real Application Clusters (RAC).

MANDATORY: Use at least two nodes. RAC single-node functionality is not currently supported.

When a provisioning response file is created using the Oracle Fusion Applications Provisioning Wizard, if only one RAC node information is provided for the Oracle Fusion Applications database, then an error is displayed during the install phase. The error is generated due to a limitation in the Oracle Data Integrator (ODI) installer and at least two RAC nodes must be provided. See Install Phase Failed with INST-07221: Specified connect string is not in a valid format Error (page 14-13).

For more information on Oracle RAC, see the Oracle database library.

Figure 4-6 RAC or Single-instance Database Decision Tree



4.4.2 Plan for Database Requirements

When determining the database configuration, consider the required instances, the required patching, listener configurations, schema and password requirements, and RCU directories.

Two databases are recommended for Oracle Internet Directory and Oracle Access Manager/Oracle Identity Manager because they are likely to have different configuration requirements. If desired, they can be combined into a single database.

4.4.2.1 Required Instance Parameters

The Oracle Fusion Applications database has specific required instance parameters. Validate Oracle-recommended database instance parameters for the Oracle Fusion Applications and Oracle Identity Management databases against the enterprise corporate guidelines for any potential issues and plan accordingly. For details, see:

Oracle Identity Management: About Initialization Parameters (page 7-3)

Oracle Fusion Applications: Minimum Configuration Parameters for Oracle Database (page 8-4)

4.4.2.2 Required Database Patches

The Oracle Fusion Applications database has specific patch requirements, which must be applied before starting the provisioning process. To determine your required patches, per corporate guidelines (e.g. CPUs), see:

Oracle Identity Management: Patch Requirements for Oracle Database 12c (page 7-2), and Patch Requirements for Oracle Database 12c (page 7-3)

Oracle Fusion Applications: Mandatory Oracle Database Patches (page 8-8)

Use these references to check for potential conflicts and plan accordingly. If necessary, request merge patches from Oracle Support.

4.4.2.3 Schema and Password Requirements

All Oracle Identity Management and Oracle Fusion Applications schema names for the Oracle Identity Management database or OID database and Oracle Fusion Applications database are fixed and cannot be modified. They are created by the Oracle Fusion Middleware RCU (Oracle Identity Management) and Oracle Fusion Applications RCU.

MANDATORY: The Oracle Fusion Middleware RCU appears to provide an option to choose a prefix for the schemas, but in this release **the prefix must always be FA.**

Therefore, on the topic of schemas, the only planning required is regarding password selection. Oracle Identity Management and Oracle Fusion Applications Provisioning Wizards give the option of choosing a different password for each schema, but the same password can be also used for all schemas or groups of schemas as desired.

The Oracle Metadata Services (MDS) Repository is a particular type of repository that contains metadata for some Oracle Fusion Middleware components. It can also include custom Java EE applications developed by the organization.

Table 4-5 (page 4-26) lists all the Oracle Fusion Applications schemas created.

Table 4-5 Oracle Fusion Middleware and Oracle Fusion Applications Schema Owners

Component	Schema
Oracle Fusion Applications	Includes: • FUSION • FUSION_DYNAMIC • FUSION_RUNTIME • FUSION_APM • FUSION_AQ • FUSION_BI • FUSION_DQ • FUSION_ODI_STAGE • FUSION_SETUP
AS Common Schemas • Enterprise Scheduler Service • Metadata Services	Includes: • FUSION_ORA_ESS • CRM_FUSION_MDS_SOA • FIN_FUSION_MDS_SOA • HCM_FUSION_MDS_SOA • OIC_FUSION_MDS_SOA • PRC_FUSION_MDS_SOA • PRJ_FUSION_MDS_SOA • SCM_FUSION_MDS_SOA • SETUP_FUSION_MDS_SOA • HED_FUSION_MDS_SOA • FUSION_MDS • FUSION_MDS_ESS • FUSION_MDS_SPACES
Secure Enterprise Search	SEARCHSYS
Oracle Data Integrator • Primary and Work Repository	FUSION_ODI
Enterprise Content Management • Oracle Content Server 11*g* - Complete • Oracle Imaging and Process Management	Includes: • FUSION_OCSERVER11G • FUSION_IPM
Oracle Business Intelligence (Platform)	FUSION_BIPLATFORM
Oracle BI Applications Schemas • Oracle Transactional BI • Oracle BI Cloud Adapter	Includes: • FUSION_OTBI • FUSION_BIA_CLOUD
WebLogic Server Communication Services • SIP Infrastructure Location Service • Presence • SIP Infrastructure Subscriber Data Service	Includes: • FUSION_ORASDPLS • FUSION_ORASDPXDMS • FUSION_ORASDPSDS

Table 4-5 (Cont.) Oracle Fusion Middleware and Oracle Fusion Applications Schema Owners

Component	Schema
SOA and BPM Infrastructure • User Messaging Service • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure • SOA Infrastructure	Includes: • FUSION_ORASDPM • CRM_FUSION_SOAINFRA • FIN_FUSION_SOAINFRA • HCM_FUSION_SOAINFRA • OIC_FUSION_SOAINFRA • PRC_FUSION_SOAINFRA • PRJ_FUSION_SOAINFRA • SCM_FUSION_SOAINFRA • SETUP_FUSION_SOAINFRA • HED_FUSION_SOAINFRA
WebCenter Suite • WebCenter Spaces • Portlet Producers • Activity Graph and Analytics • Discussions	Includes: • FUSION_WEBCENTER • FUSION_PORTLET • FUSION_ACTIVITIES • FUSION_DISCUSSIONS • FUSION_DISCUSSIONS_CRAWLER
Audit	Includes: • FUSION_IAU • FUSION_IAU_APPEND • FUSION_IAU_VIEWER
Oracle Social Network	Includes: • FUSION_RDF • FUSION_SOCIAL • FUSION_SOCIAL_CEF • FUSION_SOCIAL_VIEWS
Fusion Data Integration	Includes: • FUSION_INTEGRATION_CURRENT • FUSION_INTEGRATION_PREVIOUS • FUSION_INTEGRATION_FINAL
Oracle Enterprise Data Quality	Includes: • FUSION_EDQFUSION • FUSION_EDQCONFIG1 • FUSION_EDQRESULTS1 • FUSION_EDQCONFIG2 • FUSION_EDQRESULTS2
Fusion Applications Read Only Diagnostic	FUSION_RO FUSION_ERO
Fusion Risk and Controls	FUSION_GRC

Table 4-5 (Cont.) Oracle Fusion Middleware and Oracle Fusion Applications Schema Owners

Component	Schema
Oracle Database Vault	Includes: • LCM_EXP_ADMIN • LCM_OBJECT_ADMIN • LCM_SUPER_ADMIN • LCM_USER_ADMIN • DVOWNER • DVACCTMGR
Fusion Middleware Data Source Consolidation	FMW_RUNTIME
Oracle Platform Security Services (OPSS)	FUSION_OPSS

Table 4-6 (page 4-28) shows all the Oracle Identity Management schemas created:

Table 4-6 Oracle Identity Management Schemas

Component and Database Name	Schema	Service Name
Oracle Internet Directory OIDDB	Includes: • ODSSM • ODS	OIDEDG.mycompany.com
Oracle Identity and Access Management IDMDB	Includes: • FA_OAM • FA_MDS • FA_IAU • FA_OPSS	IAMEDG.mycompany.com

4.4.2.4 Oracle Fusion Applications RCU Directories

The Oracle Fusion Applications transactional database requires the creation of several DBA directories, listed in the following table. Directory creation is performed when the Oracle Fusion Applications RCU is run.

To plan for these DBA directories, decide where the corresponding file system directories are created on the database server and add those locations to the *Oracle Fusion Applications Installation Workbook*. The locations are requested when the Oracle Fusion Applications RCU is run.

DBA Directory Name	Purpose	Requirements
APPLCP_FILE_DIR	Used by Oracle Enterprise Scheduler to store the log and output files.	Must be valid on the database server with read-write permissions to the database owner. For Oracle RAC, must point to a location that is shared across all nodes.

DBA Directory Name	Purpose	Requirements
APPLLOG_DIR	Location of the PL/SQL log files from Oracle Fusion Applications PL/SQL procedures on the database server.	Ensure that the database owner has read-write privileges.
FUSIONAPPS_PROV_RECOVERY_DIR (RCU OBIEE Backup Directory)	Location of the Oracle Business Intelligence Enterprise Edition dump files. These files are used for enabling a restart action.	Ensure that the database owner has read-write privileges. For Oracle RAC, must point to a location that is shared across all nodes.
FUSIONAPPS_DBINSTALL_DP_DIR	Directory where to copy the Oracle Fusion Applications database dump files.	Ensure that the database owner has read-write privileges. For Oracle RAC, must point to a location that is shared across all nodes.
OTBI_DBINSTALL_DUMP_DIR (RCU OTBI Dump File Directory)	Directory on the database server where Oracle Transactional Business Intelligence dump file is stored.	Ensure that the database owner has read-write privileges. For Oracle RAC, must point to a location that is shared across all nodes.

4.4.2.5 Oracle Identity Management Split Database Configuration

The Oracle Identity Management Provisioning tool allows to use a dedicated database for OID (OIDDB), which holds the ODS and ODSSM schemas used by it. With this configuration, only the ODS and ODSSM schemas are placed on a different database, all other IDM schemas are still located in the IDMDB.

This configuration can be used for the Advanced replication features of the Oracle Database to perform multi-primary replication across multiple OID instances. Otherwise, a separate database for OID is not required.

4.4.3 Complete the Database Tab of the Oracle Fusion Applications Installation Workbook

To complete the **Fusion Applications Transactional Database** table:

- **FA DB Type:** Select a database type from the list.
- **FA DB Datafiles Location:** Enter a location for the FA DB datafiles.
- **FA DB Service Name:** Enter the global database name, such as `fadb.mycompany.com`.
- **FA DB Service Instance:** Enter the FA DB instances. If RAC is used, separate the instances with commas in the *Oracle Fusion Applications Installation Workbook* table cell.
- **RCU Directories:** Enter the different RCU directories. When the Repository Creation Utility is started to populate schemas for Oracle Fusion Applications, it asks for these directories. Note that they are local to the database server. See Run the Oracle Fusion Applications RCU to Create Oracle Fusion Applications Database Objects (page 8-25).

To complete the **IDM Database** table:

- **IDM DB TYPE:** Select a database type from the list.
- **IDM DB Oracle Home:** Enter the directory of the IDM DB ORACLE_HOME.
- **IDM DB Datafiles Location:** Enter a location for the IDM DB datafiles.
- **IDM DB Service Name:** Enter the global database name, such as `fadb.mycompany.com`.
- **IDM DB Service Instance:** Enter the IDM DB instances. If a RAC is used, separate the instances with commas in the *Oracle Fusion Applications Installation Workbook* table cell.
- **IDM DB Prefix:** Enter FA in the Oracle Identity Management Provisioning Wizard when prompted. This is for running the Oracle Fusion Middleware RCU utility.

To use the OID database or the Oracle Fusion Applications Data Warehouse, enter the same parameters in their respective tables.

4.5 Identity Management: Plan the Oracle Identity Management Configuration

The following topics provide concepts needed to plan an Oracle Identity Management installation and to fill out the Identity Management tab in the *Oracle Fusion Applications Installation Workbook*:

- Identity Store (page 4-30)
- LDAP Context (page 4-30)
- Location for Files Generated During Oracle Identity Management Provisioning (page 4-31)
- Oracle Access Manager Transfer Mode (page 4-31)

4.5.1 Identity Store

Oracle Fusion Applications supports one type of Identity Store: OID. With the OID option, identity information is physically stored in OID.

Integration with other products for single-sign -on (SSO) may have specific requirements, e.g. Ebusiness Suite integration. OID offers additional options. One of them is DIP (Directory Integration Platform), which performs synchronization between OID and other directories.

4.5.2 LDAP Context

LDAP directories are used by Oracle Fusion Applications for storing identities - users and groups (acting as the Identity Store), as well as authorization policies and credentials (acting as the Policy Store/Credential Store).

Oracle Identity Management Provisioning provides the option to choose the context root for the Identity Store, i.e. the starting point in the directory tree for storing user and group information. Normally, the ID Store context root is based on the domain name, e.g. for a company with domain name "mycompany.com", the ID Store context root

chosen is normally "dc=mycompany,dc=com". Provisioning then creates sub-contexts for Users (cn=Users), groups (cn=Groups) among others.

For the Policy Store, Oracle Identity Management Provisioning automatically creates contexts for the two policy stores (IDM and FA), under cn=jpsroot and cn=FAPolicies, respectively. Oracle Identity Management Provisioning does not allow to change them. During Oracle Fusion Applications Provisioning, context root for the FA Policy Store is requested, and although it is possible to choose a different one (Oracle Fusion Applications Provisioning can create it if necessary), it is recommended to use the one previously created by Oracle Identity Management Provisioning.

The table below provides a summary of the LDAP context roots used by Oracle Fusion Applications:

Service	Default	Directory Type	Can be User-Defined?
Identity Store (Oracle Fusion Applications/Oracle Identity Management) Realm DN	dc=mycompany,dc=com (example)	OID	Yes
IDM Policy Store	cn=jpsroot	OID	No.
Fusion Applications Policy Store	cn=FAPolicies	OID	Yes

4.5.3 Location for Files Generated During Oracle Identity Management Provisioning

Oracle Identity Management Provisioning automatically generates files to be used during Oracle Fusion Applications Provisioning, providing a more streamlined integration between the two.

Once the Oracle Identity Management Provisioning process finishes, the generated files can be found under IDM_INSTALL_APPCONFIG_DIR/fa. These files must be copied to a directory accessible from all Oracle Fusion Applications nodes before Oracle Fusion Applications Provisioning, so planning for this involves simply defining the location where these files are and adding the information to the *Oracle Fusion Applications Installation Workbook*.

4.5.4 Oracle Access Manager Transfer Mode

Oracle Access Manager (OAM) Transfer Mode refers to the transport security modes for communication between the Oracle Access Manager Server (OAM Server) and the Web gates. While OAM in general supports three different mode options (Open, Simple and Cert), the only available mode for Oracle Fusion Applications Provisioning is "Simple" for all platforms.

The table below provides a summary of OAM Transfer Modes and availability in Oracle Fusion Applications Provisioning. A single mode must be selected for the entire installation (including Oracle Identity Management) in accordance to the table. In simpler terms: all platforms require Simple mode.

Table 4-7

OAM Mode	Description	Available in Fusion Applications Provisioning
Open	Uses un-encrypted communication	No
Simple	Uses encrypted communication through SSL with a public key certificate issued by Oracle	Yes
Cert	Uses encrypted communication through SSL with a public key certificate issued by a trusted third-party certificate authority.	No

4.5.5 Oracle Internet Directory Password Policies

By default, Oracle Internet Directory passwords expire in 120 days. Users who do not reset their passwords before expiration can no longer authenticate to Oracle Internet Directory. Note that this includes administrative users, such as `oamadmin`, and the Oracle Identity Management environment cannot work properly unless these users can authenticate. For information about changing Oracle Internet Directory password policies, see Managing Password Policies in the *Oracle Fusion Middleware Administrator's Guide for Oracle Internet Directory* .

4.5.6 Complete the Identity Management Tab of the Oracle Fusion Applications Installation Workbook

The *Oracle Fusion Applications Installation Workbook* provides sample values to make many of these entries self-explanatory.

4.5.6.1 Complete the LDAP Table

Review LDAP Context (page 4-30) to obtain the information required for the DN entries in this table.

- **Identity Store Realm DN:** Format described in the table in LDAP Context (page 4-30).
- **LDAP User DN:** The User DN is a subtree of the Identity Store Realm DN (above). Naming format is fixed: `cn=Users`
- **LDAP Group DN:** The Group DN is a subtree of the Identity Store Realm DN (above). Naming format is fixed: `cn=Groups`
- **FA JPS root DN:** Refer to the table in LDAP Context (page 4-30) to derive.

4.5.6.2 Complete the IDM Provisioning Files Table

- **IDM Properties file location:** When Oracle Identity Management Provisioning is complete, a file is created in the `IDM Shared Configuration Location/fa` directory (as defined on the **Storage** tab, **Install Directories** table). This file must be made available to the Oracle Fusion Applications Provisioning process. If the original location is accessible to the Oracle Fusion Applications Provisioning

tool, enter that location in the *Oracle Fusion Applications Installation Workbook*. Otherwise, copy the file to an accessible location and note the new location here.

- **IDM Keystore file location:** Not used in this release.

4.5.6.3 Complete the OAM Table

Only one field in this table can be edited, and it is generally not necessary to do even that one.

- **OAM Administrator User name**: It is recommended to keep the default (`OAMAdminUser`) unless explicitly instructed to change this.

4.5.6.4 Complete the Identity Store/Policy Store Table:

Most of the fields in this table cannot be edited. The exceptions are below:

- **FA Node Manager Username:** Use the default or edit if desired.
- **LDAP Password Expiration Interval:**

  Enter the number of days left for the LDAP password to expire.

4.6 SSL and Certificates

This section describes requirements that apply to the *SSL and Certificates* tab in the *Oracle Fusion Applications Installation Workbook*.

4.6.1 Out-of-the-Box SSL Configuration

Out of the box, the Oracle Identity Management and Oracle Fusion Applications Provisioning frameworks configure their respective components to use SSL connections between the end users and the load balancer or reverse proxy (or Web Tier if an load balancer or reverse proxy is not used). This is mandatory and cannot be changed.

Oracle Identity Management Provisioning provides the option to select SSL or non-SSL for the `IDM Admin` HTTP endpoint, as noted in the *Oracle Fusion Applications Installation Workbook*. Select **yes** to have the endpoint configured for SSL automatically during Oracle Identity Management Provisioning.

If a load balancer is used, the connection between the LBR and the Web Tier is configured as non-SSL, out of the box. Therefore, the HTTP listener on the Oracle HTTP Server is non-SSL.

If a load balancer is not used, Oracle Identity Management behaves differently from Oracle Fusion Applications:

- **Oracle Fusion Applications:** The end-user (external) connections are still SSL, but they terminate at the Web Tier instead. (FA OHS is configured to listen to SSL traffic.)
- **Oracle Identity Management:** All external endpoints are non-SSL. (IDM OHS is configured to listen to regular HTTP traffic.)

4.6.2 SSL Certificate Requirements

SSL Certificate requirements depend on whether the topology uses a load balancer/ reverse proxy or not.

If using an LBR/RP: Because both Oracle Identity Management and Oracle Fusion Applications terminate SSL connections at the load balancer, it is necessary to set up the appropriate SSL certificates on the load balancer BEFORE starting the provisioning process. The certificates should be created and provisioned to the LBR/RP according to the policies and procedures, along with the instructions provided by the load balancer or reverse proxy manufacturer.

If not using an load balancer or reverse proxy: SSL terminates at OHS, which is configured with a default dummy certificate. As the dummy certificate is not trusted by browsers, end users get certificate warning messages when they access any external URL. To avoid this, configure OHS to use certificate(s) signed by a trusted certificate authority (CA). This can be an external certificate authority such as Verisign, or an internal certificate authority whose root certificate is trusted by the browser. See Configure Oracle HTTP Server with Custom Certificates (page 16-20).

4.7 Memory Requirements

Table 4-8 (page 4-34) lists the default memory settings for WebLogic administration and managed servers in the Oracle Fusion Applications environment. Follow Table 4-8 (page 4-34) to plan for the memory requirements of the provisioning hosts. Pplan for additional memory for operating system and reserve enough spare memory to give room for future growth and scale out.

Table 4-8 Memory Requirements for WebLogic Administration and Managed Servers

Memory Specifics	Requirements
Memory per Managed Servers	2.75GB (2816MB) multiplied by the number of managed servers in the environment, plus 4GB.
Memory Per Administration Servers	1GB multiplied by the number of administration servers in the environment, if the WebLogic domain is not a product family of the product offerings that are selected (see Table 2-2 (page 2-4)). 2GB multiplied by the number of administration servers in the environment, if the WebLogic domain is a product family of the product offerings that are selected (see Table 2-2 (page 2-4)).
Business Intelligence Cluster (bi_cluster / BIDomain)	6GB multiplied by the number of managed servers in the environment.
Oracle Enterprise Data Quality Cluster (EDQCluster / CommonDomain)	16GB for one instance of EDQ WebLogic managed server created out-of-the-box if any of the product offerings listed below are selected: • CRM: Sales, Marketing, Customer Data Management, Enterprise Contracts. • Financials: Financials, Procurement • SCM: Product Management, Material Management, Logistics, and Supply Chain Financial Orchestration

Table 4-8 (Cont.) Memory Requirements for WebLogic Administration and Managed Servers

Memory Specifics	Requirements
Workforce Reputation Cluster (WorkforceReputationCluster / HCMDomain)	8GB multiplied by the number of managed servers in the environment if any of the product offerings listed below are selected: • Workforce Deployment • Workforce Development See Recommended Memory Requirement for Oracle Fusion Human Capital Management Workforce Reputation Management Product (page 22-8).

4.8 Next Steps

When the *Oracle Fusion Applications Installation Workbook* is entirely filled out, proceed with Prepare for an Installation (page 5-1).

5
Prepare for an Installation

This section describes the prerequisites for provisioning a new applications environment. Before creating the new environment, review the actions described in the following sections to help ensure a smooth installation.
This section includes the following topics:

- Prepare Storage Components (page 5-1)
- Prepare the Oracle Identity Management Server (page 5-3)
- Prepare the Oracle Fusion Applications Server (page 5-6)
- Prepare the Network (page 5-16)
- Create the Oracle Fusion Applications Provisioning Repository (page 5-25)
- What to Do Next (page 5-30)

5.1 Prepare Storage Components

This section describes the following topics:

- Prepare Shared Storage for Oracle Identity Management and Oracle Fusion Applications (page 5-1)
- Mount the Shared Storage (page 5-2)
- Verify Install Directory Location (page 5-2)
- Verify the /etc/oraInst.loc File (page 5-2)

5.1.1 Prepare Shared Storage for Oracle Identity Management and Oracle Fusion Applications

Prepare the shared storage for Oracle Identity Management and Oracle Fusion Applications as defined in the *Oracle Fusion Applications Installation Workbook*. Ensure the shared storage has the required space as defined in Storage: Plan Storage Configuration (page 4-15) and that they are configured according to the instructions detailed in Shared Storage Considerations (page 4-20).

> **Tip:**
>
> The shared storage property value is available in the *Oracle Fusion Applications Installation Workbook*, then in the **Storage** tab, and then the **Shared Storage** section .

5.1.2 Mount the Shared Storage

Mount the shared storage on each server according to the information defined in the *Oracle Fusion Applications Installation Workbook* , the in the **Storage tab** , and the in the **Shared Storage** table. Ensure that the file system is mounted as read-write.

If different shared storage are used for Oracle Identity Management and Oracle Fusion Applications, follow these steps to mount each shared drive:

- The Oracle Identity Management shared storage should be mounted on the servers running Oracle Identity Management components (see the Topology tab in the *Oracle Fusion Applications Installation Workbook*).
- The Oracle Fusion Applications shared storage should be mounted on the servers running Oracle Fusion Applications components (see the Topology tab in the *Oracle Fusion Applications Installation Workbook*).

5.1.3 Verify Install Directory Location

Ensure the locations defined for the Install Directories and Temporary Shared Storage are owned by the appropriate user, are read/write and can be created later during install. They may include both shared and local file systems.

For servers located in the DMZ, which normally don't have access to the shared storage, the same base path used for the other servers (as defined in the *Oracle Fusion Applications Installation Workbook*) is applicable.

> **Tip:**
>
> The directory location values are available in the *Oracle Fusion Applications Installation Workbook* , then the **Storage** tab, then **Temporary Shared Storage** table, and then the **Installers Directory Location** field.

5.1.4 Verify the /etc/oraInst.loc File

Ensure there is no `oraInst.loc` file present in the `/etc` directory unless using a central inventory and preferring to not have the installer create it later (which requires root access). In this case, ensure the `oraInst.loc` file points at the location defined for `oraInventory` in the *Oracle Fusion Applications Installation Workbook*. The `oraInst.loc` file contains the following two lines:

```
inventory_loc=<oraInventory path>

inst_group=<oraInventory owner group>
```

The file must be present and have the correct `oraInventory` and group owner values **for all servers**.

> **Tip:**
>
> The planned inventory location values are available in the *Oracle Fusion Applications Installation Workbook* , then the Storage tab, and then Inventories table.

5.2 Prepare the Oracle Identity Management Server

This section describes tasks must be performed before running the Oracle Identity Management Provisioning Wizard. Many of these tasks are platform-specific.

5.2.1 Ensure Software Install Location is 45 Characters or Fewer

When planning the Oracle Identity Management deployment, ensure that the **Software Installation Location** directory path is 45 characters or fewer in length. Specify this directory on the Installation and Configuration page when the provisioning profile is created. A longer path name can cause errors during Oracle Identity Management provisioning. See Null Error Occurs When WebLogic Patches Are Applied (page 11-3).

5.2.2 Configure Kernel Parameters

UNIX: The kernel parameter and shell limit values shown below are recommended values only. For production database systems, Oracle recommends to tune these values to optimize the performance of the system. See the operating system documentation for more information about tuning kernel parameters.

Kernel parameters must be set to a minimum of those below on all nodes in the cluster.

The values in the following table are the current Linux recommendations. See the *Oracle Fusion Middleware System Requirements and Specifications*.

To deploy a database onto the host, it might be necessary to modify additional kernel parameters.

Table 5-1 UNIX Kernel Parameters

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

Linux:

To set these parameters:

1. Log in as `root` and add or amend the entries in `/etc/sysctl.conf`.
2. Save the file.
3. Activate the changes by issuing the command:
4. `/sbin/sysctl -p`

Solaris:

The table lists the recommended kernel parameters on Solaris. Verify that the kernel parameters shown in the table are set to values greater than or equal to the minimum value shown.

Table 5-2 Solaris Kernel Parameters

Resource Control	Minimum Value
project.max-sem-ids	100
process.max-sem-nsems	256
project.max-shm-memory	4294967295
project.max-shm-ids	100

To verify the current value of kernel parameters:

1. Retrieve the project id:

   Example:

   ```
   $ /bin/id -p
   ```

   `uid=100(oracle) gid=100(dba) projid=1 (group.dba)`, where `group.dba` is the project ID

2. Execute `prctl` command with the project ID to get the current value:

   ```
   /bin/prctl -n project.max-sem-ids -i project <project-id>
   ```

   ```
   /bin/prctl -n process.max-sem-nsems -i project <project-id>
   ```

   ```
   /bin/prctl -n project.max-shm-memory -i project <project-id>
   ```

   ```
   /bin/prctl -n project.max-shm-ids -i project <project-id>
   ```

If any value listed for *privileged* is below the recommended value, increase it:

1. Use `projmod` command to set the value with root.

   ```
   /usr/sbin/projmod -s -K "process.max-sem-
   nsems=(privileged,VALUE,deny)" <project-id> -
   ```

   ```
   /usr/sbin/projmod -s -K "project.max-shm-ids=(privileged,VALUE,deny)"
   <project-id> -
   ```

   ```
   /usr/sbin/projmod -s -K "process.max-sem-ops=(privileged,VALUE,deny)"
   <project-id> -
   ```

   ```
   /usr/sbin/projmod -s -K "project.max-shm-
   memory=(privileged,VALUE,deny)" <project-id> -
   ```

2. After setting the parameters, check the values in `/etc/project` using below command: `$cat /etc/project`. The following line will be added:

   ```
   project:::project.max-shmmemory=(privileged,2147483648,deny)
   ```

3. To verify that the parameter is active, login as the project user and run the following commands:

   ```
   /bin/id -p
   ```

   ```
   /bin/prctl -n <Kernel parameter> -i process $$
   ```

Example:

```
$ /bin/id -p
uid=100(oracle) gid=100(dba) projid=1 (group.dba)
$ /bin/prctl -n project.max-sem-ids -i process $$
process: 24679: -tcsh
NAME PRIVILEGE VALUE FLAG ACTION RECIPIENT
project.max-sem-ids privileged 100 - deny - system 16.8M max deny
```

5.2.3 Set the Open File Limit

On all UNIX operating systems, the minimum Open File Limit should be 150000.

The following examples are for Linux operating systems. For other operating systems, consult the respective documentation to determine the commands to be used.

Linux: See how many files are open with the following command:

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

To check the open file limits, use the following commands:

C shell:

```
limit descriptors
```

Bash:

```
ulimit -n
```

Solaris:

See how many files are open with the following command:

```
/usr/local/bin/lsof | wc -l
```

To check the open file limits, use the following command:

```
/bin/ulimit -n
```

5.2.4 Set Shell Limits

UNIX:

To change the shell limits, login as `root` and edit the `/etc/security/limits.conf` file.

Add the following lines:

```
* soft  nofile  150000
* hard  nofile  150000
* soft  nproc   327679
* hard  nproc   327679
```

If installing on Oracle Linux Server release 6, edit `/etc/security/limits.d/90-nproc.conf` to make sure it has the following line:

```
* soft nproc 327679
```

After editing the file, reboot the machine.

Solaris:

To change the shell limits, login as `root` and edit the `/etc/system` file.

To set shell limits parameter:

```
rlim_fd_cur 150000

rlim_fd_max 150000

maxuprc 327679

max_nprocs 327679
```

After editing the file, reboot the machine.

5.2.5 Enable Unicode Support

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

On UNIX operating systems, Oracle highly recommends to enable Unicode support by setting the `LANG` and `LC_ALL` environment variables to a locale with the UTF-8 character set. This enables the operating system to process any character in Unicode.

If the operating system is configured to use a non-UTF-8 encoding, some components may function in an unexpected way. Oracle does not support problems caused by operating system constraints.

5.2.6 Synchronize Oracle Internet Directory Nodes

Synchronize the time on the individual Oracle Internet Directory nodes using Greenwich Mean Time so that there is a discrepancy of no more than 250 seconds between them.

If OID Monitor detects a time discrepancy of more than 250 seconds between the two nodes, the OID Monitor on the node that is behind stops all servers on its node. To correct this problem, synchronize the time on the node that is behind in time. The OID Monitor automatically detects the change in the system time and starts the Oracle Internet Directory servers on its node.

5.3 Prepare the Oracle Fusion Applications Server

Before creating the new environment, review the following actions in this section to help ensure a smooth installation.

- Increase the Open Files Limit (page 5-7)
- Define the Local Port Range (page 5-9)
- Synchronize the System Clocks (page 5-9)
- Synchronize Date Time Stamp (page 5-9)
- Set the Kernel Parameter Value (page 5-10)
- Unset LIBPATH Variable (page 5-11)

- Set the System Time Zone (page 5-11)
- Create the hwrepo directory (page 5-11)
- Verify Swap Space (UNIX) (page 5-12)
- Edit Host Names (UNIX) (page 5-13)
- Default Shell (UNIX) (page 5-13)
- Install en_US.UTF-8 Locale (UNIX) (page 5-13)
- Increase Entropy Values (Linux) (page 5-14)
- Check for the Required Solaris Patch (Solaris Only) (page 5-15)

5.3.1 Increase the Open Files Limit

Increase the limit of open files to 327679 or higher for the operating system.

For Linux x86-64:

Modify `/etc/security/limits.conf` to read as follows:

- *`FUSION_USER_ACCOUNT`* `soft nofile 327679`
- *`FUSION_USER_ACCOUNT`* `hard nofile 327679`

Edit `/etc/ssh/sshd_config` as follows:

1. Set `UsePAM` to `Yes`.
2. Restart `sshd`.
3. Logout (or reboot) and log in again.

Increase the maximum open files limit.

Edit `/proc/sys/fs/file-max` and set it to 6553600. The change becomes effective immediately but does not persist after a reboot. To make the change permanent edit `/etc/sysctl.conf` and set `fs.file-max = 6553600`. This change does not be effective until the `sysctl` command is run or the server is rebooted.

For Oracle Solaris on SPARC (64-bit):

Edit `/etc/system` and set as follows:

```
set rlim_fd_cur=327679

set rlim_fd_max=327679
```

5.3.2 Increase the Max User Processes

For all platforms, typically, have max user processes set to 16384:

```
$ulimit -u 16384
```

Increase the maximum user process to 16384 or higher.

Linux:

To check the max user processes:

```
$ulimit -u
```

```
16384
```

To change the max user processes:

Modify `/etc/security/limits.conf` to read as follows:

```
FUSION_USER_ACCOUNT soft nproc 16384

FUSION_USER_ACCOUNT hard nproc 16384
```

Solaris:

To check the max user processes:

```
$ulimit -u

16384
```

To change the maximum user processes:

Modify below parameter in `file /etc/system`:

```
maxuprc = 16384

max_nprocs = 16384
```

After editing the file, reboot the machine.

The value of 16384 for max user processes is the recommended starting value for installing Oracle Fusion Applications in a multi-host topology. Depending on the hardware topology for the Oracle Fusion Applications environment planned for setup, a higher number for max user processes might need to be used when allocating more WebLogic domains and managed servers into a fewer number of hosts. Is is recommended to go through a proper sizing exercise to determine the configuration.

When a host reaches the limit of the max user processes during provisioning of Oracle Fusion Applications, the following error messages might be encountered while starting additional managed server processes even when the IP address and port number are valid.

Node Manager log:

```
2013-12-28 03:31:57.932 NOTIFICATION
[logStatus] STATE=BUILD_ERROR!TIMESTAMP=2013-12-28
03:31:57 GMT!TARGET=common-apps-startup!CATEGORY=BUILD_ERROR!
DOMAIN=HCMDomain!HOSTNAME=<host>!PRODUCTFAMILY=hcm!PRODUCT=HCM-Talent!
TASK=nodeManagerStartServer!TASKID=hcm.HCM-Talent.BUILD_ERROR.common-apps-
startup.nodeManagerStartServer!MESSAGE=Node Manager Start Server operation
could not be carried out. Please check the log files
in the Managed Server directory <file path to a managed
server directory>/logs/ and the NodeManager log at <APPLICATIONS_CONFIG>/
nodemanager/<host>/nodemanager.log to find out details of the
problem.!DETAIL=Process execution failed with return code: 1.
Check the logs for more information.!BUILDFILE=<FAPROV_HOME>/provisioning/
provisioning-build/common-lifecycle-build.xml!LINENUMBER=68!
```

Failed Managed Server log:

```
####<Dec 28, 2013 3:31:39 AM GMT> <Error> <Server> <host>
<TalentManagementServer_1> <DynamicListenThread[Default]> <<WLS Kernel>>
<> <> <1388201499505> <BEA-002606> <Unable to create a server socket
```

```
for listening on channel "Default". The address <ip address> might be
incorrect or another process is using port <port>: java.net.BindException:
Address already in use.>

####<Dec 28, 2013 3:31:39 AM GMT> <Critical> <WebLogicServer>
<host> <TalentManagementServer_1> <Main Thread> <<WLS Kernel>> <> <>
<1388201499517> <BEA-000362> <Server failed. Reason: Server failed to bind
to any usable port. See preceeding log message for details.>
```

5.3.3 Define the Local Port Range

Define the local port range to ensure that it does not overlap with the ports used by the Java Virtual Machines (JVMs) and other servers. This action avoids port conflicts during server startup. To view and modify `localRange`:

Linux:

To view:

```
$cat /proc/sys/net/ipv4/ip_local_port_range
```

To modify:

```
$echo "32768 61000" > /proc/sys/net/ipv4/ip_local_port_range
```

To make the local port range permanent after server restart, add (or update) the following line in `/etc/sysctl.conf`:

```
net.ipv4.ip_local_port_range = 32768 61000
```

Solaris:

To view:

```
#/usr/sbin/ndd /dev/tcp tcp_smallest_anon_port tcp_largest_anon_port
```

To modify:

```
#/usr/sbin/ndd -set /dev/tcp tcp_smallest_anon_port 32768

#/usr/sbin/ndd -set /dev/tcp tcp_largest_anon_port 61000
```

5.3.4 Synchronize the System Clocks

All engine and data tier servers (including SIP) must accurately synchronize their system clocks to a common time source, to within one or two milliseconds. Large differences in system clocks can cause severe problems.

5.3.5 Synchronize Date Time Stamp

Before provisioning, ensure that the provisioning server and the computer hosting Oracle Access Server have the same date and time stamp settings. The WebGate installation fails with an Oracle Access Manager certificate error if the date and time settings on the provisioning server are different from the Oracle Access Server.

5.3.6 Set the Kernel Parameter Value

Before installing the Oracle Database using the Provisioning Wizard, ensure that the value of the kernel parameter `shmmax` on the database host is greater than the value of the System Global Area (SGA) Memory.

The value of SGA Memory (sga_target) is 9 GB in the default Database Configuration Assistant (DBCA) template for the Starter database. If DBCA is run using the production DBCA template packaged with Oracle Fusion Applications Provisioning, the value of the SGA Memory is 18 GB. Ensure that `shmmax` > (`shmall * shmmni`) > `SGA Memory`, where `shmmax`, `shmall`, `shmmni` are kernel parameters.

Linux:

For example, to retrieve the values of these kernel parameters, use the following command:

```
user@host> /sbin/sysctl -a | grep shm
kernel.shmmni = 4096
kernel.shmall = 3145728
kernel.shmmax = 12884901888
```

To set the value of a kernel parameter:

```
user@host> /sbin/sysctl -w sys.kernel.shmmax=value
```

Solaris:

To check the current values of these kernel parameters:

1. Execute `id` to get the project ID.

   Example: `$ /bin/id -p`

   `uid=100(oracle) gid=100(dba) projid=1 (group.dba),` where `group.dba` is the project ID

2. Execute `prctl` with the resource control and project ID to get the current value:

   ```
   /bin/prctl -n project.max-shm-memory -i project <project-id>
   ```

   ```
   /bin/prctl -n project.max-shm-ids -i project <project-id>
   ```

If any value listed for `privileged` is below the recommended value, increase it using the following commands:

1. Execute `projmod` (as root) to set to a new value:

   ```
   /usr/sbin/projmod -s -K "project.max-shm-ids=(privileged,100,deny)"
   <project-id>
   ```

   ```
   /usr/sbin/projmod -s -K "project.max-shm-
   memory=(privileged,4294967295,deny)" <project-id>
   ```

2. Confirm that the following values are set in `/etc/project`:

   Example: `$ cat /etc/project`

   Check for `project.max-shm-ids=(privileged,100,deny)`, within the line for the project ID to confirm `project.max-shm-ids` was set correctly.

3. Verify that the parameter is active by logging in as the project user and executing the following commands:

```
/bin/id -p

/bin/prctl -n <resource control> -i process $$
```

Example:

```
$ /bin/id -p

uid=100(oracle) gid=100(dba) projid=1 (group.dba)

$ /bin/prctl -n project.max-sem-ids -i process $$

NAME PRIVILEGE VALUE FLAG ACTION RECIPIENT

project.max-sem-ids

privileged 100 - deny -

system 16.8M max deny -
```

4.

5.3.7 Unset LIBPATH Variable

Before provisioning an Oracle Fusion Applications environment make sure the LIBPATH variable is not set. See Start the Wizard and Prepare to Install (page 13-5).

UNIX:

- Use *env* or *echo $LIBPATH* to check if the variable is set.
- Use *unsetenv LIBPATH* to unset the variable.

5.3.8 Set the System Time Zone

All server machines must have the same time zone settings as described in the following paragraph:

- The time zone should be the standard time zone for the instance.
- Set the TZ environment variable on Linux or an equivalent on other operating systems to have a valid time zone ID.
- Check the time zone setting using the command: `echo $TZ`. The tzselect tool may be handy if the setting needs to be changed.
- Oracle WebLogic Server and Oracle Database then derive the default VM and database time zones from the system, respectively, unless otherwise configured. JVMs and the database need to be running in the same time zone.

5.3.9 Create the hwrepo Directory

If the Oracle Fusion Human Capital Management (Oracle Fusion HCM) application offerings are being provisioned, namely Workforce Development and Workforce Deployment, and the Workforce Reputation Management feature is planned to be used, perform the following tasks after provisioning is complete:

1. Create a directory named `/mnt/hwrrepo` for the provisioning hosts.
2. Mount a shared disk as needed by the Workforce Reputation (HWR) application.

3. Grant directory permission to the user/group who owns the Oracle Fusion Applications WLS domain(s). This user can start or shut down the Oracle Fusion Applications environment.

   UNIX: Run this shell command as root and replace `<user id>:<group id>` with appropriate user and group identifiers:

   ```
   chown <user id>:<group id> /mnt/hwrrepo
   ```

4. Change read/write permission for the directory `/mnt/hwrrepo` to be globally readable/writable.

   UNIX: Run this shell command as root:

   ```
   chmod 750 /mnt/hwrrepo
   ```

A warning message is displayed in the provisioning log during the preverify phase when the Workforce Development and Workforce Deployment offerings are selected for provisioning if the directory is not setup. The warning message is a reminder. Proceed with provisioning the environment and mount the shared disk **after** provisioning is complete and before starting using the Workforce Reputation application.

5.3.10 Verify Swap Space (UNIX)

For UNIX platforms, ensure that the provisioning hosts have a miminum of 1 GB of swap space. During the provisioning of an Oracle Fusion Applications environment, a validation test is performed in the preverify phase. An error message is displayed if the provisioning hosts do not have at least 1 GB of swap space. This error must be resolved by increasing the swap space before proceeding with provisioning the environment.

UNIX:

Use `free` or `top` command to verify swap space. Refer to the respective Operating System manual for details about how to increase swap space.

A warning is received if there is at least 1 GB of swap space but less than the larger of 2 GB and 10% of memory allocated to the host. This means if a host has less than 20 GB of memory, then the swap space must be at least 2 GB. If a host has more than 20 GB of memory, then the swap space must be at least 10% of the memory.

The decision on whether to set swap space higher than 10% of the memory is a performance tuning exercise that can be made at a later time. Under certain conditions in some platforms, it might be necessary to increase swap space to 30% of the memory in order to complete provisioning an environment.

On the provisioning host where the Oracle Business Intelligence domain is provisioned, ensure it has at least 7 GB of swap space.

Solaris:

To see how many files are open, use the following command:

```
/usr/local/bin/lsof | wc -l
```

To check the open file limits, use the command below.

```
/bin/ulimit -n
```

5.3.11 Edit Host Names (UNIX)

For UNIX platforms, confirm that the host names are correctly formatted in `/etc/hosts`, for each host that is participating in provisioning. Review `/etc/hosts` for each participating host and edit any host entries that do not meet the following recommendations:

1. The format for each host entry should follow this format:

   ```
   IP_address canonical_hostname [aliases]
   ```

   The `canonical_hostname` should be the same as the fully qualified host name. Errors can occur if a short version, or alias, of the host name is specified first in `/etc/hosts`. The usage of aliases is optional and can be left empty. Examples of correct and incorrect entries follow:

   ```
   (Correct) 141.80.151.100 myMachine.company.com  myMachine
   (Incorrect) 141.80.151.100  myMachine  myMachine.company.com
   ```

2. If the machine name is a logical host name and is different from the physical host name specified in `/etc/sysconfig/network`, then the entry for the logical machine should be listed before the entry of the physical host name in `/etc/hosts`. If the machine is always accessed using its logical host name, there is no need to have an entry for the physical host name in /etc/hosts. Examples of entries in the correct order follow:

   ```
   141.80.151.100 myLogicalMachine.company.com  myLogicalMachine
   141.80.151.100 myPhysicalMachine.company.com  myPhysicalMachine
   ```

   If the order of host names is reversed from what is shown in the example, then there may be errors in retrieving the logical host name.

WARNING: Do not enter multiple host aliases into a single line in the `/etc/hosts` file. There are some software components which do not process a line with more than 700 characters. Some error messages might be encountered during provisioning phases, such as "UNABLE TO OPEN CREDENTIAL STOREFAILED TO ADUTPSINITIALIZE" caused by incorrect resolution of the host names. If a host has many aliases, then limit the line to 700 characters and break it down into separate lines. Ensure that each line begins with the IP_address and canonical_hostname, then the aliases.

5.3.12 Default Shell (UNIX)

Ensure that `/bin/bash` shell is installed on the hosts before provisioning an Oracle Fusion Applications environment. Ensure that the provisioning hosts have bash shell version 3.2 or higher when upgrading the environment at a later time.

5.3.13 Install en_US.UTF-8 Locale (UNIX)

To provision on UNIX platforms, ensure that the `en_US.UTF-8` locale is installed on the operating system of the provisioning hosts. Oracle Business Intelligence expects the `en_US.UTF-8` locale in the operating system before provisioning the Oracle Fusion Applications environment. Use the `locale` command to list the locale-specific information of the operating system.

If the en-US.UTF-8 locale is not installed, an error is encountered during the provisioning configure phase. The runProvisioning-bi-configure.log displays the following error message:

```
FAILED:Distributing Repository

Error:

<APPLICATIONS_BASE>/fusionapps/bi/bifoundation/provision/scripts/bidomain/
bi-install.xml:274: exec returned: 1.
```

Inspecting the oraInventory logs, it indicates that the EN_US.UTF-8 locale must be installed on the provisioning host for Oracle Business Intelligence. The error message is:

```
Executing Task: Distributing Repository

[CONFIG]:Distributing Repository

ReEncrypting RPD: [nQSError: 46116] The locale EN_US.UTF-8 needs to be
installed on the machine for the Oracle BI locale setting english-usa
specified in
NQSConfig.INI.javax.management.RuntimeMBeanException:javax.management.Runt
imeMBeanException: Repository File '<APPLICATIONS_CONFIG>/BIInstance/tmp/
OracleBIApps.rpd' does not exist or is not accessible.
```

If this error is encountered during the configure phase, install the missing locale and then retry the configure phase to complete the task.

5.3.14 Increase Entropy Values (Linux)

Make sure the hosts have enough entropy values in the provisioning hosts. If this value is less than 1000, increase it to a value to a greater value using the rngd command. Run these commands as the root user for the current session:

To check the entropy value:

```
cat /proc/sys/kernel/random/entropy_avail
```

To increase the entropy value:

```
rngd -r /dev/urandom -o /dev/random
```

To set the rngd service to start automatically after rebooting the host, enter the following text into a script, such as, start.rngd, and run the script as root user:

```
#! /usr/bin/perl -w

# minimum required bytes to be happy with the device
my $want_bytes = 8192;

# list of commands to check
my clist = qw(/sbin/rngd /usr/sbin/rngd); S

# list of device names to check
my slist = qw(
  /dev/hwrandom /dev/hw_random /dev/hwrng /dev/intel_rng /dev/i810_rng
  /dev/urandom
);
```

```
use Fcntl qw(O_RDONLY);

# find the rngd binary
my $command;

foreach (clist) {
  -x && ($command = $_) && last;
}

# stop if rngd isn't installed
defined $command || die "$0 error: rngd is not installed\n";


# look for a hw random device
my $source;
my $continue = 1;
$SIG{'ALRM'} = sub { $continue = 0 };

foreach my $test (slist) {
  -e $test || next;

  alarm 2;
  $continue = 1;

  my $bytes = 0;

  sysopen FILE, $test, O_RDONLY or next;
  while ($continue) {
    sysread FILE, $_, 4096 or last;
    $bytes += length $_;
  }
  close FILE;

  if ($bytes > $want_bytes) {
    $source = $test;
    last;
  }
}


# use the select command and source
print "starting $command with $source... ";
system "$command -r $source";
print "done.\n";

exit 0;
```

5.3.15 Check for the Required Solaris Patch (Solaris Only)

For Solaris 10 Only

For Oracle Solaris on SPARC (64-bit) platforms, ensure that the Solaris Operating System patch 150400-xx is installed on the servers.

For Oracle Solaris on x86-64 (64-bit) platforms, ensure that the Solaris x64 Operating System patch 150401-xx is installed on the servers.

These patches can be obtained from My Oracle Support.

For Solaris 11 Only

Ensure that the Solaris Package SUNWttf-bh-luxi is installed on the FA servers for both Oracle Solaris on SPARC (64-bit) and Oracle Solaris on x86-64 (64-bit) platforms.

The Solaris 11 Update 3 on SPARC or x86-64 requires the Support Repository Update (SRU) 11.3.3.6.0 or later (mandatory patch).

5.4 Prepare the Network

This section describes the network environment configuration required by Oracle Fusion Applications, more specifically these three areas:

- Name Resolution: Configure Name Resolution (page 5-16)
- Load Balancers or Reverse Proxy: Configure Load Balancers/Reverse Proxy (page 5-19)
- Firewall: Configure Firewalls (page 5-22)

While name resolution configuration applies to all topologies, the remaining topics (load balancer/reverse proxy and firewall) apply only if any of those are present in the topology.

5.4.1 Configure Name Resolution

At this point, configure name resolution for all endpoints in the environment. This includes:

- Web Tier Virtual Hosts (Internal and External), if used
- HTTP LBR Endpoints (Internal and External), if used
- LDAP Endpoints
- Oracle WebCenter Content (UCM) LBR Endpoint, if the environment is highly available
- AdminServer VIPs, if used
- Managed Server VIPs, if used

Name resolution can be done in DNS or in the Hosts file. Each table has a column called Name Resolution which defines if that specific endpoint should be resolved via DNS or Hosts file.

5.4.1.1 Name Resolution for Oracle Fusion Applications Web Tier Virtual Hosts

Use Table 5-3 (page 5-17) along with the information in the *Oracle Fusion Applications Installation Workbook* to create the necessary DNS or Hosts entries for name resolution for the environment.

Table 5-3 Name Resolution for Oracle Fusion Applications Web Tier Virtual Hosts

Name resolution for	Name for HTTP Endpoint	Points at IP Address
Oracle Fusion Applications (for each component: Financials, Projects, Procurement, Supplier Portal, IC, Common, CRM, SCM, HCM, BI)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table, • **FA WebTier Internal Name** column (for each component) • **FA WebTier External Name** column (for each component)	FA WebTier *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab. **FA WebTier Virtual Hosts** table, **IP Endpoint** column
Oracle Identity Management (IDM and IDM Admin)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table, • **IDM WebTier Internal Name** column (for each component) • **IDM WebTier External Name** column (for each component)	IDM WebTier *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table, **IP Endpoint** column

5.4.1.2 Name Resolution for HTTP LBR Endpoints

Use Table 5-4 (page 5-17) along with the information in the *Oracle Fusion Applications Installation Workbook* to create the necessary DNS or Hosts entries for name resolution for the environment:

Table 5-4 Name Resolution for HTTP LBR Endpoints

Name resolution for	Name for HTTP Endpoint	Points at IP Address
External	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **External Name** column (for each component)	External Load Balancer / Reverse Proxy *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **External IP Endpoint** column
Internal	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Name** column (for each component)	Internal Load Balancer / Reverse Proxy *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal IP Endpoint** column

5.4.1.3 Name Resolution for LDAP Endpoints

Use Table 5-5 (page 5-18) along with the information in the *Oracle Fusion Applications Installation Workbook* to create the necessary DNS or Hosts entries for name resolution for the environment:

Table 5-5 Name Resolution for LDAP Endpoints

Name resolution for	Name for LDAP Endpoint	Points at IP Address
Policy Store (OID)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **LDAP Endpoints** table, **Hostname** column	Internal Load Balancer, if using one; otherwise OID *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **IP Endpoint** column

5.4.1.4 Name Resolution for Other Endpoints

Use Table 5-6 (page 5-18) along with the information in the *Oracle Fusion Applications Installation Workbook* to create the necessary DNS or Hosts entries for name resolution for the environment:

Table 5-6 Name Resolution for Other Endpoints

Name Resolution for	Name for Endpoint	Points at IP Address
UCM LBR Endpoint	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **UCM LBR Endpoint** table, **Hostname** column	Internal Load Balancer, if using one; otherwise not necessary *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **UCM LBR Endpoint** table, **IP Endpoint** column
AdminServer Virtual Hosts / VIPs	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **AdminServer Virtual Hosts / VIPs** table, **Virtual Hostname** column (for each component)	Active AdminServer host for each domain *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **AdminServer Virtual Hosts / VIPs** table, **Virtual IP** column (for each component)

Table 5-6 (Cont.) Name Resolution for Other Endpoints

Name Resolution for	Name for Endpoint	Points at IP Address
Managed Server Virtual Hosts/ VIPs	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **Managed Server Virtual Hosts/ VIPs** table, **Virtual Hostname** column (for each component) (multiple columns for HA)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **Managed Server Virtual Hosts/ VIPs** table, **Virtual IP** column (for each component) (multiple columns for HA)

5.4.2 Configure Load Balancers/Reverse Proxy

If the Oracle Fusion Applications Topology includes the use of a Load Balancer or Reverse Proxy, they must be configured appropriately for Oracle Fusion Applications, which has specific requirements for:

- Load balancing settings
- SSL termination
- Mappings

The instructions provided distinguish between internal traffic (to Internal HTTP endpoints and TCP/LDAP endpoints) and external traffic (External HTTP endpoints), so they can be used for topologies with one or two load balancer devices deployed separately on each network (internal and external). For more information about load balancer placement on the network, see Network Placement of Load Balancers/ Reverse Proxy (page 4-6).

If the topology has a single load balancer device deployed on a single network, ensure the security implications of this have been fully considered and ensure the relevant firewall ports are opened to allow traffic through it. For more information about how to configure the firewall, see Configure Firewalls (page 5-22).

5.4.2.1 Configure Load Balancer/ Reverse Proxy Settings

If a load balancer or reverse proxy is being used, follow the guidelines from Load Balancer Feature Requirements (page 4-8) along with the requirements to configure their settings.

5.4.2.2 Configure Certificates and SSL

Oracle Fusion Applications configures SSL to terminate at the Load Balancer/Reverse Proxy, so you may also have to configure certificates, as appropriate, on the load balancer or reverse proxy.

The *Oracle Fusion Applications Installation Workbook*, SSL and Certificates tab contains the SSL Communication table which lists the communication that will be SSL-enabled during installation. In the current release of Oracle Fusion Applications there are two options for SSL termination:

- External HTTP Endpoints (mandatory)

- IDM Admin HTTP Endpoint (optional)

If a load balancer is used, set up certificates appropriately and ensure that SSL termination is configured for the endpoints that will use SSL when executing the next section.

5.4.2.3 Configure Load Balancer/Reverse Proxy Mappings

Once name resolution for endpoints is configured, the load balancer or reverse proxy mappings must be configured if one is being used. Use Table 5-7 (page 5-20) along with the information in the *Oracle Fusion Applications Installation Workbook* to create the necessary Load Balancer/Reverse Proxy mappings:

5.4.2.3.1 External HTTP LBR Endpoints

These should be configured at the load balancer or reverse proxy that provides external access to Oracle Fusion Applications (for end-users and external integrations as shown in Table 5-7 (page 5-20)).

Table 5-7 External HTTP LBR Endpoints

External LBR Mapping for	Hostname on LBR/RP	Port on LBR/RP	Maps to (Node)	Maps to (Port)
Oracle Fusion Applications (for each component: Financial, Projects, Procurement, Supplier Portal, IC, Common, CRM, SCM, HCM, BI)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts**tab, **HTTP LBR Endpoints** table, **External Name** column (for each component)	*Oracle Fusion Applications Installation Workbook*. **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **External Port** column (for each component)	*Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Topology** table, All nodes containing the component FA Web Tier	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table, **External Port** column (for each component)
Oracle Identity Management (IDM)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **External Name** column	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **External Port** column	*Oracle Fusion Applications Installation Workbook* , **Topology** tab, **Topology** table, All nodes containing the component IDM Web Tier	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table, **External Port** column

5.4.2.3.2 Internal HTTP Endpoints

The default configuration when using the load balancer option during Oracle Fusion Applications provisioning is for the source environment to also have internal endpoints at the load balancer. In this case, create also appropriate mappings. Note that internal and external Load Balancer/Reverse Proxy(s) may be different.

Table 5-8 Internal HTTP Endpoints

Internal LBR Mapping for	Hostname on LBR/RP	Port on LBR/RP	Maps to (Node)	Maps to (Port)
Oracle Fusion Applications (for each component: Financial, Projects, Procurement, Supplier Portal, IC, Common, CRM, SCM, HCM, BI)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Name** column (for each component)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Port** column (for each component)	*Oracle Fusion Applications Installation Workbook* , **Topology** tab, **Topology** table, All nodes containing the component FA Web Tier	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table, **Internal Port** column (for each component)
Oracle Identity Management (IDM and IDM Admin)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Name** column (for each component)	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Port** column (for each component)	*Oracle Fusion Applications Installation Workbook* , **Topology** tab, **Topology** table, All nodes containing the component IDM Web Tier	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table, **Internal Port** column (for each component)

5.4.2.3.3 TCP/LDAP Endpoints

In a highly-available or scaled-out topology, the load balancer is used to route requests to the various instances of Oracle Internet Directory and WebCenter Content. The communication protocol in this case is TCP (more specifically LDAP for OID).

Table 5-9 TCP/LDAP Endpoints

TCP LBR Mapping for	Hostname on LBR/RP	Port on LBR/RP	Maps to (Node)	Maps to (Port)
OID Identity Store (OID)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **LDAP Endpoints** table, **Hostname** column	*Oracle Fusion Applications Installation Workbook* , **Network - Virtual Hosts** tab, **LDAP Endpoints** table, **Port** column	*Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Topology** table, All nodes containing the component IDM Identity and Access (or all nodes that contain OID)	*Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **Port Number** column for Component **OID**
UCM (Oracle WebCenter Content)	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **UCM LBR Endpoint** table, **Hostname** column	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **UCM LBR Endpoint** table, **Port** column	*Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Topology** table, All nodes containing the component FA Common Domain (or all nodes that contain the UCM_server Managed Server)	UCM port is defined during Oracle Fusion Applications Provisioning (defaults to 7012 when Oracle Fusion Applications base port has the default value 7000)

5.4.3 Configure Firewalls

If the Oracle Fusion Applications environment is deployed in a topology where its tiers are separated by firewalls, configure the firewall to allow traffic through certain ports in order to install and use the environment.

For more information about different Oracle Fusion Applications topologies and tiers, see Oracle Fusion Applications Topologies (page 2-13).

Firewalls are normally found between the following tiers:

- End User and Web Tier (DMZ)
- Web Tier (DMZ) and Mid Tier
- Mid Tier and IDM Directory Tier
- Mid Tier and Database Tier

Table 5-10 (page 5-23) lists the expected traffic between the different tiers in Oracle Fusion Applications. Use it with the *Oracle Fusion Applications Installation Workbook* and information about the environment's firewall configuration to determine which ports must be opened.

Table 5-10 Expected Traffic between different tiers in Oracle Fusion Applications

From	To	Ports	Protocol	Notes
End user	External Load Balancer/ Reverse Proxy	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, External **Port** column (for each component)	HTTP	Applicable if a Load Balancer/ Reverse Proxy is used for external HTTP traffic
End User	FA Web Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table: **FA WebTier Internal Port** column (for each component) **FA WebTier External Port** column (for each component)	HTTP	Applicable if no Load Balancer/ Reverse Proxy is used
End User	IDM Web Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table: **IDM WebTier Internal Port** column (for each component) **IDM WebTier External Port** column (for each component)	HTTP	Applicable if no Load Balancer/ Reverse Proxy is used
External Load Balancer / Reverse Proxy	FA Web Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table: **FA WebTier Internal Port** column (for each component) **FA WebTier External Port** column (for each component)	HTTP	Applicable if a Load Balancer/ Reverse Proxy is used for external HTTP traffic
External Load Balancer / Reverse Proxy	IDM Web Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table: **IDM WebTier Internal Port** column (for each component) **IDM WebTier External Port** column (for each component)	HTTP	Applicable if a Load Balancer/ Reverse Proxy is used for external HTTP traffic
FA Web Tier	FA Mid Tier	All AdminServer and Managed Server ports in all Oracle Fusion Applications WebLogic Domains	HTTP / TCP(T3)	T3 traffic: OHS registration with the AdminServers

Table 5-10 (Cont.) Expected Traffic between different tiers in Oracle Fusion Applications

From	To	Ports	Protocol	Notes
FA Web Tier	IDM Application Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers**table, **IDMDomain OAM AAA Server Port** field	TCP (OAP)	OAP traffic: WebGate to OAM Server
IDM Web Tier	IDM Application Tier	All AdminServer and Managed Server ports in the WebLogic IDMDomain field	HTTP / TCP (T3) / TCP (OAP)	T3 traffic: OHS registration with the AdminServers OAP traffic: WebGate to OAM Server
FA Mid Tier	IDM Web Tier	If not using an Load Balancer/ Reverse Proxy for Internal HTTP traffic: *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **IDM WebTier Virtual Hosts** table, **IDM WebTier Internal Port** column (for IDM and IDM Admin) If using a Load Balancer/ Reverse Proxy for Internal HTTP traffic: *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Port** column (for IDM and IDM Admin)	HTTP	
FA Mid Tier	IDM Directory Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **LDAP Endpoints** table, **Port** and **SSL Port** columns for Policy Store (OID)	TCP (LDAP)	
FA Mid Tier	FA Mid Tier (via LBR)	UCM port is defined during Oracle Fusion Applications Provisioning (defaults to 7012 when Oracle Fusion Applications base port is at the default value 7000)	TCP	Applicable only for HA environments where UCM has a load balancer as frontend

Table 5-10 (Cont.) Expected Traffic between different tiers in Oracle Fusion Applications

From	To	Ports	Protocol	Notes
IDM Mid Tier	FA Web Tier	If not using a Load Balancer/ Reverse Proxy for Internal HTTP traffic: *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table, **FA WebTier Internal Port** column (for HCM) If using a load balancer or reverse proxy for Internal HTTP traffic: *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **Internal Port** column (for HCM)	HTTP	
IDM Application Tier	IDM Directory Tier	*Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **LDAP Endpoints** table, **Port** and **SSL Port** columns for **ODI Identity Store (OID)**	TCP (LDAP)	
FA Mid Tier	FA Database	*Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **Ports** for each one of the **FA DB Instances**	SQL*Net / JDBC	
FA Mid Tier	IDM Database	*Oracle Fusion Applications Installation Workbook*, **Database** tab, **IDM Database** table, **Ports** for each one of the **IDM DB Instances**	SQL*Net / JDBC	
FA Mid Tier	FA Data Warehouse Database	*Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Data Warehouse Database** table, **Ports** for each one of the **FA DW DB Instances**	SQL*Net / JDBC	Applies only if a Data Warehouse database is used

5.5 Create the Oracle Fusion Applications Provisioning Repository

The provisioning repository contains all the installers required to provision a new Oracle Fusion Applications environment. Download the repository from

the Oracle Fusion Applications Product Media Package to a preferred location (*repository_location*).

The Oracle Identity Management Lifecycle Tools and the Oracle Fusion Applications provisioning wizard are packaged in the same Oracle Fusion Applications Media Packs downloaded from Oracle Software Delivery Cloud as detailed in Download from the Oracle Software Delivery Cloud Portal (page 5-27). Oracle Identity Management is in the `idmlcm` folder and the Oracle Fusion Applications provisioning wizard is in the `faprov` folder. When installing Oracle Identity Management ensure that the provisioning repository is accessible to the Oracle Identity Management hosts.

To set up a demilitarized zone (DMZ) for the web tier in the new environment, see Set Up a Demilitarized Zone (DMZ) for the Web Tier (page 6-9) before creating the repository.

5.5.1 Obtain the Software

Oracle groups its software releases by product area. A **Product Media Pack** refers to those groupings. Each media pack may also include a zipped file containing electronic documentation files or *Quick Install* files, which facilitate the initial installation of the software.

For installations of Oracle Fusion Applications, have available the complete set of software contained in the product media pack. Individual pieces cannot be installed. Therefore, to install from media that is no longer available on Oracle Software Delivery Cloud, contact My Oracle Support to obtain the complete media pack.

After the software licensing agreements have been completed, obtain the Oracle Fusion Applications software using one of these two methods:

- **Oracle Software Delivery Cloud Portal**: Provides a readme document that helps to determine which media is needed to fulfill the purchased license. Download only the necessary media. This is the default delivery method.
- **My Oracle Support**: Provides a complete set of the software in DVD format. Use only the DVDs covered by thesoftware licensing agreement.

Using either method, obtain the Oracle Fusion Applications Provisioning repository and gain access to the Oracle Fusion Applications documentation library.

If Oracle Fusion Applications Release 12 Media Pack is downloaded for the following platforms, then use the following version (and above) of the UnZip / 7-Zip utility to extract the Oracle software to a preferred location (*REPOSITORY_LOCATION*). UnZip is freeware that is available at: `http://www.info-zip.org`.

- Linux x86-64 (64-bit) - Info-ZIP version 6.0
- Oracle Solaris on SPARC (64-bit) - Info-ZIP version 6.0
- Oracle Solaris on x86-64 (64-bit) - Info-ZIP version 6.0
- Microsoft Windows x64 (64-bit) - 7-Zip version 9.20

5.5.1.1 Xcopy Utility Should Not Be Used To Copy Fusion Application Repositories and APPLTOP on Microsoft Windows

The Microsoft Windows utility Xcopy does not copy long path names. Therefore, do not use Xcopy to copy Oracle Fusion Applications repositories and APPLTOP.

Resolution: Use Robocopy instead of Xcopy.

Windows: `ROBOCOPY <source dir> <destination dir> /MIR`

5.5.2 Download from the Oracle Software Delivery Cloud Portal

Go to the E-Delivery website and follow these instructions:

1. Sign in to the Oracle Software Delivery Cloud . For new users, create an Oracle account using the online form.
2. On the Search page, specify the product pack or release and platform to identify the media pack to download.
3. Choose the appropriate media pack from the search results and download the provisioning repository (in zipped format). Download the repository to a preferred location.
4. Extract the contents of all the zipped files to the same target directory. The directory must be on a networked drive or shared disk so that it is accessible to all the hosts in the new environment. By default, the unzip process places the installers in *repository_location*`/installers`.

   Create the repository location name so that unzipping the files does not run into the Windows MAX_PATH limitation.

   WARNING: Do not unzip different versions of Oracle Fusion Applications Media Packs into the same location. This causes errors when the Oracle Fusion Applications files are provisioned.

5.5.2.1 Download Language Pack Software

To use languages other than US English and install these languages during the initial installation process, perform the steps in this section.

Download the Oracle Fusion Applications NLS Release 12 software for each language to be installed. This is available from the NLS DVD media or from Oracle Software Delivery Cloud. The software for Release 12 is a zip file that contains a repository of the translated Oracle Fusion Applications files plus the installation utilities that are required to install the software.

Download the language pack repository to a preferred location. Extract the contents of all zipped files to the same target directory. This directory is referred to as REPOSITORY_LOCATION.

5.5.3 Obtain DVDs from My Oracle Support

Order a complete set of the software in DVD format by contacting My Oracle Support. Use only the DVDs covered by the software licensing agreement.

5.5.4 Download and Unzip the BI Patch 25499241 into the FA Repository (Solaris Only)

The BI patch 25499241 application fails during the Fusion Applications (FA) installation in Release 11.12.x.0.0. To resolve this issue, perform the following steps:

1. Download the patch 25499241 from ARU to any temporary directory (outside the FA repository) on the machine where the FA repository is present.
2. Remove the patch 25499241 from the FA repository as follows:

   ```
   rm -rf <REPOSITORY_LOCATION>/installers/biappsshiphome/patch/25499241
   ```

3. Extract the patch downloaded in Step 2 to the FA repository as shown in the following example:

   ```
   cd <REPOSITORY_LOCATION>/installers/biappsshiphome/patch
   unzip <PATCH_LOCATION>/p25499241_111190_SOLARIS64.zip  (for Solaris Sparc)
   unzip <PATCH_LOCATION>/p25499241_111190_Solaris86-64.zip (for Soalrisx86-64)
   ```

5.5.5 Download and Unzip the Latest OID Patch Bundle into the FA Repository (Solaris x86-64 Only)

On Solaris 11 hosts (Solaris on x86-64 systems), the OID startup may fail with core dump during Fusion Applications (FA) installation in Release 11.12.x.0.0. To resolve the OID startup failure, follow the below steps to patch the FA repository with the fix (not applicable for Solaris SPARC systems):

1. Download the OID bundle patch 25838345 from P4FA FOR FA REL 12.1 ONEOFFS SYSTEM PATCH 11.12.1.0.170628 from My Oracle Support.
2. Extract the patch bundle zip file into the following FA repository location:

   ```
   <REPOSITORY_LOCATION>/installers/pltsec/patch
   ```

5.5.6 Verify Required Operating System Packages and Libraries

Oracle Fusion Applications require specific operating system packages and libraries in the hosts where the software is installed. During the preverify phase of provisioning an Oracle Fusion Applications environment as detailed in Provision a New Oracle Fusion Applications Environment (page 13-1), the Provisioning Wizard and the provisioning command line verifies if the hosts have the required packages, libraries, and other requirements such as swap space, free space, and kernel parameters. Any issues during the check are reported in the provisioning log. To perform the manual checks ahead of time, follow these steps after creating the provisioning repository.

For Database Host

1. Navigate to *REPOSITORY_LOCATION*`/installer/database/Disk1`.
2. Run the command:

   UNIX: `./runInstaller -executePrereqs -silent`

3. Review the output located at: `oraInventory/logs/installAction<timestamp>.log`. For example, `oraInventory/logs/installActionyyyy-mm-dd_hh-mm-ssPM.log`.

Other Oracle Fusion Applications Hosts

1. Navigate to *REPOSITORY_LOCATION*`/installer/<product>/Disk1`, where <product> represents:
   - atgf
   - biappsshiphome

- bishiphome
- dbclient
- ecm_bucket2
- fusionapps
- odi
- soa
- wc
- webgate
- webtier

Optionally, include also the following products:

- bhd
- gop

2. Run the command:

   UNIX: `./runInstaller -sv -jreLoc REPOSITORY_LOCATION\jdk`

3. Review the output located at: `oraInventory/logs/install<timestamp>.out`. For example, `oraInventory/logs/installyyyy-mm-dd_hh-mm-ssAM.out`.

4. Repeat Step 1 to Step 3 for all products listed in Step 1.

Example 5-1 Sample Output

If any of the stated library (or package) is not found, obtain and install the library (or package) in order to continue after the preverify phase of the provisioning process.

Note: The list of libraries and version are example values. Thus, refer to the actual output from the environment for the correct values.

```
$$$$$DEBUG>>>>Packages
Checking for binutils-2.17.50.0.6; found binutils-2.17.50.0.6-20.el5_8.3-
x86_64.    Passed
Checking for compat-libstdc++-33-3.2.3-x86_64; found compat-libstdc+
+-33-3.2.3-61-x86_64.    Passed
Checking for compat-libstdc++-33-3.2.3-i386; found compat-libstdc++-33-3.2.3-61-
i386.    Passed
Checking for elfutils-libelf-0.125; found elfutils-libelf-0.137-3.el5-x86_64.
Passed
Checking for elfutils-libelf-devel-0.125; found elfutils-libelf-
devel-0.137-3.el5-x86_64.    Passed
Checking for gcc-4.1.1; found gcc-4.1.2-54.el5-x86_64.    Passed
Checking for gcc-c++-4.1.1; found gcc-c++-4.1.2-54.el5-x86_64.    Passed
Checking for glibc-2.5-12-x86_64; found glibc-2.5-107.el5_9.5-x86_64.    Passed
Checking for glibc-2.5-12-i686; found glibc-2.5-107.el5_9.5-i686.    Passed
Checking for glibc-common-2.5; found glibc-common-2.5-107.el5_9.5-x86_64.
Passed
Checking for glibc-devel-2.5-x86_64; found glibc-devel-2.5-107.el5_9.5-
x86_64.    Passed
Checking for glibc-devel-2.5-12-i386; Not found.    Failed <<<<
Checking for libaio-0.3.106-x86_64; found libaio-0.3.106-5-x86_64.    Passed
Checking for libaio-0.3.106-i386; found libaio-0.3.106-5-i386.    Passed
Checking for libaio-devel-0.3.106; found libaio-devel-0.3.106-5-i386.    Passed
Checking for libgcc-4.1.1-x86_64; found libgcc-4.1.2-54.el5-x86_64.    Passed
Checking for libgcc-4.1.1-i386; found libgcc-4.1.2-54.el5-i386.    Passed
```

```
Checking for libstdc++-4.1.1-x86_64; found libstdc++-4.1.2-54.el5-x86_64.
Passed
Checking for libstdc++-4.1.1-i386; found libstdc++-4.1.2-54.el5-i386.    Passed
Checking for libstdc++-devel-4.1.1; found libstdc++-devel-4.1.2-54.el5-
x86_64.    Passed
Checking for make-3.81; found make-1:3.81-3.el5-x86_64.    Passed
Checking for sysstat-7.0.0; found sysstat-7.0.2-12.0.1.el5-x86_64.    Passed
Check complete. The overall result of this check is: Failed <<<<

Check Name:Kernel
Check Description:This is a prerequisite condition to test whether the minimum
required kernel parameters are configured.
Checking for VERSION=2.6.18; found VERSION=2.6.18-348.4.1.0.1.el5.    Passed
Checking for hardnofiles=4096; found hardnofiles=327679.    Passed
Checking for softnofiles=4096; found softnofiles=327679.    Passed
Check complete. The overall result of this check is: Passed
Kernel Check: Success.
Checking for VERSION=2.6.18; found VERSION=2.6.18-348.4.1.0.1.el5.    Passed
Checking for hardnofiles=4096; found hardnofiles=327679.    Passed
Checking for softnofiles=4096; found softnofiles=327679.    Passed
Check complete. The overall result of this check is: Passed

Check Name:GLIBC
Check Description:This is a prerequisite condition to check whether the
recommended glibc version is available on the system
Expected result: ATLEAST=2.5-12
Actual Result: 2.5-107.el5_9.5
Check complete. The overall result of this check is: Passed
GLIBC Check: Success.
Expected result: ATLEAST=2.5-12
Actual Result: 2.5-107.el5_9.5
Check complete. The overall result of this check is: Passed
```

5.6 Next Steps

Install the Oracle Identity Management Lifecycle Tools and the Oracle Fusion Applications Provisioning Framework. Go to Install the Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks (page 6-1) to get started.

6

Install the Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks

This section describes how to install the Oracle Identity Management and Oracle Fusion Applications provisioning frameworks.
This section includes the following topics:

- Introduction to Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks (page 6-1)
- Install the Oracle Identity Management Provisioning Tools (page 6-1)
- Install the Oracle Fusion Applications Provisioning Framework (page 6-5)
- Set Up a Demilitarized Zone (DMZ) for the Web Tier (page 6-9)
- What to Do Next (page 6-10)

6.1 Introduction to Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks

The Oracle Identity Management Provisioning Framework which consists of the Oracle Identity Management Provisioning Wizard and related tools was developed to automate Oracle Identity Management Provisioning and reduce the time required to configure Oracle Identity Management for Oracle Fusion Applications.

The Oracle Fusion Applications Provisioning installer (faprov) is delivered with the other installers in the provisioning repository. The purpose of faprov is to create the Oracle Fusion Applications Provisioning framework consisting of the Provisioning Wizard, Provisioning Command-line interface and Provisioning-related files and utilities.

6.2 Install the Oracle Identity Management Provisioning Tools

The Oracle Identity Management Provisioning tools share a repository with the Oracle Fusion Applications Provisioning tools.

The software required by Oracle Identity Management is located in the Oracle Fusion Applications repository. If the repository has not been already created, follow the instructions in Create the Oracle Fusion Applications Provisioning Repository (page 5-25) to create one.

6.2.1 Verify Java and Ant

Ensure that the Provisioning Repository contains Java and Ant. Java should reside in a directory called `jdk`. Ant should reside in a directory called `ant`. The paths should be:

UNIX:

```
REPOSITORY_LOCATION/jdk
REPOSITORY_LOCATION/provisioning/ant
```

For more information about the contents of the provisioning framework, see Table 6-3 (page 6-9).

6.2.2 Oracle Identity Management Provisioning Framework Installation Checklist

Before initiating the Oracle Identity Management Provisioning Framework installation, verify the following checklist:

- Necessary infrastructure
  - Access to the server console is provided for the OS User (VNC recommended).
  - The provisioning repository or Oracle Database installer are available and accessible from the node where the Oracle Identity Management Provisioning Framework is installed.
- Prerequisites for the host where the Oracle Identity Management Provisioning Framework is installed.

6.2.3 Install the Oracle Identity Management Lifecycle Tools

The Oracle Identity Management Provisioning Wizard is a component of the Oracle Identity Management Lifecycle Tools, which also includes the Oracle Identity Management Patching Framework. Install the tools by running an installer, which is located in the provisioning repository.

In a multi-host environment, the Oracle Identity Management Lifecycle Tools must be visible to each host in the topology.

The installation script for the Oracle Identity Management Lifecycle Tools resides in the directory:

```
REPOSITORY_LOCATION/installers/idmlcm/idmlcm/Disk1
```

where *REPOSITORY_LOCATION* is the Oracle Fusion Applications provisioning repository, as described in Create the Oracle Fusion Applications Provisioning Repository (page 5-25).

To begin installing the tools, change to that directory and start the script.

UNIX:

```
cd REPOSITORY_LOCATION/installers/idmlcm/idmlcm/Disk1

export JAVA_HOME=repository_location/jdk
```

```
./runInstaller -jreLoc REPOSITORY_LOCATION/jdk
```

Then proceed as follows in Table 6-1 (page 6-3):

Table 6-1 Oracle Identity Management Lifecycle Tools Installation Screen Flow

Screen	Description and Action Required
Specify Inventory Directory (UNIX)	If this is the first Oracle installation on this host, specify the location of the **Inventory Directory**. The inventory directory is used by the installer to keep track of all Oracle products installed on this host In the **Operating System Group Name** field, select the group whose members need to be granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. The **Inventory Location Confirmation** dialog prompts to run the *inventory_directory*/createCentralInventory.sh script as root to create the /etc/oraInst.loc file. This file is a pointer to the central inventory and must be present for silent installations. It contains two lines: inventory_loc=*path_to_central_inventory* inst_group=*install_group* The standard location for this file is /etc/oraInst.loc, but it can be created anywhere. Note that the default for Linux platforms is /etc/oraInst.loc. For Solaris, the default value is /var/opt/oracle/oraInst.loc. If the file is created in a directory other than /etc, include the -invPtrLoc argument and enter the location of the inventory when the provisioningWizard or the runProvisioning scripts are run. **Note:** In Solaris platforms, the following error message may appear at the end of execution of the createCentralInventory.sh script as root user: ERROR: ./createCentralInventory.sh: line 53: syntax error at line 54: 'zero byte' unexpected Ignore the error and proceed further. To continue the installation without root access on this host, select **Continue installation with local inventory**. Click **OK** to continue.

Table 6-1 (Cont.) Oracle Identity Management Lifecycle Tools Installation Screen Flow

Screen	Description and Action Required
Welcome	No action is necessary on this read-only screen. Click **Next** to continue.
Install Software Updates	Search the latest software updates, including important security updates, via a My Oracle Support account. • **Skip Software Updates**: Select this option to skip this screen. The installer does not check for updates that might be applicable to the current product installation. • **Search My Oracle Support for Updates**: Select this option to automatically search for and download applicable software updates from My Oracle Support. Enter a valid My Oracle Support account name and password, and click **Search for Updates**. Before searching for updates, test the login credentials and the connection to My Oracle Support by clicking **Test Connection**. Click **Proxy Settings** to configure a proxy server if one is required. • **Search Local Directory for Updates**: Select this option if the latest software updates have been already downloaded. This option is used to search a local directory for updates applicable to the products about to be installed. If this option is selected, the installer displays an additional field and **Browse** button. This button is used to identify the local directory where the updates are located.
Prerequisite Checks	An analysis of the host computer is performed to ensure that specific operating system prerequisites have been met. If any prerequisite check fails, the screen displays a short error message at the bottom. Fix the error and click **Retry**. To ignore the error or warning message, click **Continue**. Click **Abort** to stop the prerequisite check process for all components. Click **Next** to continue.
Specify Installation Location	Specify a location where the provisioning framework is installed. Enter the following information: • **Oracle Middleware Home**: This is the parent directory of the directory where the Oracle Identity Management Provisioning Wizard is installed. In a multi-host Oracle Identity Management environment, this must be on shared storage. • **Oracle Home Directory**: This is a subdirectory of the Oracle Middleware Home directory where the wizard is installed. The installation process creates a logical directory called the Oracle home. This location is where software binaries are stored. No runtime process can write to this directory. The directory must initially be empty. Click **Next** to continue.

Table 6-1 (Cont.) Oracle Identity Management Lifecycle Tools Installation Screen Flow

Screen	Description and Action Required
Installation Summary	A summary of the selections made during this installation session is presented. To change this configuration before installing, select a screen from the left navigation pane or click **Back** to return to a previous screen. Click **Save** to create a text file (response file) to use to perform the same installation later. Click **Install** to begin installing this configuration.
Installation Progress	The progress indicator shows the percentage of the installation that is complete, and indicates the location of the installation log file. Click **Next** when the progress indicator shows 100 percent.
Installation Complete	A summary of the installation that was just completed is presented. To save the details to a text file, click **Save** and indicate a directory to save the file. Click **Finish** to dismiss the screen and exit the installer.

6.3 Install the Oracle Fusion Applications Provisioning Framework

The Oracle Fusion Applications Provisioning installer (`faprov`) is delivered with the other installers in the provisioning repository. The purpose of `faprov` is to create the Oracle Fusion Applications Provisioning framework, which contains the following components:

- **Provisioning Wizard**: A question-and-answer interview that guides through the process of installing a database, creating or updating a response file, and provisioning or deinstalling an Oracle Fusion Applications environment.

  WARNING: Run the Provisioning Wizard on the primordial host to create a provisioning response file. If the Provisioning Wizard is run on a non-primordial host to create a provisioning response file, the validation assumes that the host is the primordial host. Ensure that the validation errors are interpreted correctly as they may not be applicable to the non-primordial host.

  WARNING: When provisioning a new environment, run only the Provisioning Wizard on the primordial host and the Provisioning Command-line Interface on non-primordial hosts
- **Provisioning Command-Line Interface (CLI)**: Used for starting the wizard and running installation phases on the Primary host, Secondary host, and DMZ host (when present).
- **Provisioning-Related Files and Utilities**: The ANT utilities, binary files, library files, templates, locations of saved response files and provisioning build scripts, and other provisioning utilities required for performing provisioning tasks.

Because the provisioning installer is a customized version of the Oracle Universal Installer (OUI), its behavior closely resembles that of the OUI.

6.3.1 Oracle Fusion Applications Provisioning Framework Installation Checklist

Before initiating the Oracle Fusion Applications provisioning framework installation, verify the following checklist:

- Necessary infrastructure
  - Access to the server console is provided for the OS User (VNC recommended).
  - The provisioning repository or Oracle Database installer are available and accessible from the node where the Oracle Fusion Applications provisioning framework is installed.
- Prerequisites for the host where the Oracle Fusion Applications provisioning framework is installed.

6.3.2 Run the Provisioning Framework Installer

To install the provisioning framework, locate the directory `REPOSITORY_LOCATION/installers/faprov/Disk1` and run the script, `runInstaller` or `setup.exe`, depending on the hardware platform. Note that `REPOSITORY_LOCATION` is the directory where the provisioning repository was created.

WARNING: Do not run the scripts, `runInstaller` or `setup.exe`, located in `REPOSITORY_LOCATION/installers/fusionapps/Disk1`. These scripts are used and run by the Provisioning Wizard and Provisioning Command-line Interface when needed. They are not meant for installing the provisioning framework.

- Use this command to start OUI from the command line to install the Provisioning Wizard. Ensure that `REPOSITORY_LOCATION` is replaced with the full file path to the provisioning repository:

  UNIX: `runInstaller -jreLoc REPOSITORY_LOCATION/jdk`

  If `-jreLoc REPOSITORY_LOCATION/jdk` is not specified in the command line, enter the file path on the command prompt.

  Ensure the 8-character file path format is used for `REPOSITORY_LOCATION`.

6.3.3 Provisioning Installer Screens and Instructions

Table 6-2 (page 6-7) lists the steps for running the provisioning framework installer.

Table 6-2 Provisioning Framework Installation Screen Flow

Screen	Description and Action Required
Specify Inventory Directory (UNIX)	If this is the first Oracle installation on this host, specify the location of the **Inventory Directory**. The inventory directory is used by the installer to keep track of all Oracle products installed on this host **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook* , **Storage** tab, **Inventories** table, **FA Provisioning Framework** row. In the **Operating System Group Name** field, select the group whose members need to be granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Shared Storage** table, **FA Shared** row, **OS Group Owner** column. The **Inventory Location Confirmation** dialog prompts to run the *inventory_directory*`/createCentralInventory.sh` script as `root` to create the `/etc/oraInst.loc` file. This file is a pointer to the central inventory and must be present for silent installations. It contains two lines: `inventory_loc=`*`path_to_central_inventory`* `inst_group=`*`install_group`* The standard location for this file is `/etc/oraInst.loc`, but it can be created anywhere. Note that the default for Linux platforms is `/etc/oraInst.loc`. For Solaris, the default value is `/var/opt/oracle/oraInst.loc`. If the file is created in a directory other than `/etc`, include the `-invPtrLoc` argument and enter the location of the inventory when the `provisioningWizard` or the `runProvisioning` scripts are run. **Note:** In Solaris platforms, the following error message may appear at the end of execution of the `createCentralInventory.sh` script as root user: `ERROR: ./createCentralInventory.sh: line 53: syntax error at line 54: 'zero byte' unexpected` Ignore the error and proceed further.

Table 6-2 (Cont.) Provisioning Framework Installation Screen Flow

Screen	Description and Action Required
	To continue the installation without `root` access on this host, select **Continue installation with local inventory**. Click **OK** to continue.
Welcome	No action is necessary on this read-only screen. Click **Next** to continue.
Prerequisite Checks	An analysis of the host computer is performed to ensure that specific operating system prerequisites have been met. If any prerequisite check fails, the screen displays a short error message at the bottom. Fix the error and click **Retry**. To ignore the error or warning message, click **Continue**. Click **Abort** to stop the prerequisite check process for all components. Click **Next** to continue.
Installation Location	In the **Location** field, specify where the provisioning framework is installed. This is the location where the Provisioning Wizard and the start command for provisioning are installed. This location is denoted as *FAPROV_HOME*. Choose any location if it is on a shared disk in a location that is accessible to all hosts in the new environment. **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **FA Provisioning Framework Location** row. The installation process creates a logical directory called the Oracle home. This location is where software binaries are stored. No runtime process can write to this directory. The directory must initially be empty. Click **Next** to continue.
Installation Summary	Summarizes the selections made during this installation session. To change this configuration before installing, select one of the screens from the left navigation pane or click **Back** to return to a previous screen. Click **Save** to create a text file (response file) that can be used to perform the same installation later. Click **Install** to begin installing this configuration.
Installation Progress	The progress indicator shows the percentage of the installation that is complete, and indicates the location of the installation log file. Click **Next** when the progress indicator shows 100 percent.
Installation Complete	Summarizes the installation just completed. To save the details to a text file, click **Save** and indicate a directory where to save the file. Click **Finish** to dismiss the screen and exit the installer.

6.3.4 Provisioning Framework Components

Table 6-3 (page 6-9) shows the components in the *FAPROV_HOME*`/provisioning` directory.

Table 6-3 Contents of the Provisioning Framework

Component Type	Component Name	General Use
ANT	ant	Java processes for installing binaries, configuring domains and subsystems (JDBD and SOA composites), deploying applications, and domain startup
Binary files	bin	Executable files, compiled programs, system files, spreadsheets, compressed files, and graphic (image) files
Library files	lib	Previously defined functions that have related functionality or are commonly used, stored in object code format
Location of saved response files	provisioning-response file	Location for completed or partially completed response files
Location of provisioning build scripts	provisioning-build	Location for build scripts that are available when called for during the provisioning of an environment
Location of templates	template	Start parameters, single sign-on configuration, and database templates
Location of utility files	util	Other provisioning utilities

6.4 Set Up a Demilitarized Zone (DMZ) for the Web Tier

The web tier contains Oracle HTTP Server, which can be installed on the same shared file system (inside the firewall) as the other components, or exist on a host in a DMZ. If the web tier is installed in a DMZ, the web tier host cannot be the same as any other host deployed, regardless of domain.

Installing the web tier in a DMZ enables to impose more restrictions on communication within the portion of the system that is within the firewall, including the following:

- The DMZ host cannot access the shared storage that is accessible by the hosts within the firewall (in the *APPLICATIONS_BASE* area where the Middleware homes are installed or the shared area).
- The DMZ host may not be able to communicate with the CommonDomain AdminServer through the firewall. If this is the case, web tier running on the DMZ is **non-managed**; that is, it is not associated with the CommonDomain running inside the firewall.

However, the *APPLICATIONS_BASE* (Oracle Fusion Applications) or *IDM_BASE* (Oracle Identity Management) file path and the directory structure under it remain the same on the DMZ host as for the other hosts that exist inside the firewall.

To set up and configure the web tier in DMZ, go to the web tier host and follow these directions:

WARNING: On a DMZ host, do not have any symlink or mount points that point to a repository or *APPLICATIONS_BASE* residing inside the firewall, that is, the repository and *APPLICATIONS_BASE* should be accessible from the DMZ host.

1. Copy the provisioning repository zipped files to a location on the web tier host to be designated as a demilitarized zone.

2. Run the provisioning framework installers for Oracle Identity Management and Oracle Fusion Applications as described in Install the Oracle Identity Management Provisioning Tools (page 6-1) and Install the Oracle Fusion Applications Provisioning Framework (page 6-5) on the DMZ host. Alternatively, copy the provisioning framework (`IDMLCM_HOME` or `FAPROV_HOME`) to the DMZ host.
3. When e the response file is created for this environment, indicate this web tier configuration by selecting the **Install Web Tier in DMZ** checkbox. See Create a Response File (page 12-4).
4. When the preverify phase is successful on the primordial host, place a copy of the response file and the generated provisioning plan (`<APPLICATIONS_BASE>/provisioning/plan/provisioning.plan`) on the DMZ host.

6.5 Next Steps

Install the Oracle Identity Management and Oracle Fusion Applications database. See Install Databases for Oracle Identity Management (page 7-1).

Consider installing Oracle Enterprise Governance, Risk and Compliance (GRC) with Oracle Fusion Applications. Although not required, GRC can serve as part of the user provisioning flow to ensure that proper controls for security exist.

7

Install Databases for Oracle Identity Management

This section describes how to install and configure the Oracle Identity Management database repositories.

- Introduction to Installing Databases for Oracle Identity Management (page 7-1)
- Prerequisites for Installing Databases for Oracle Identity Management (page 7-2)
- Oracle Identity Management Database Installation Checklist (page 7-4)
- Installing Oracle Database (page 7-4)
- Installing Oracle Real Application Clusters (page 7-5)
- Running the Oracle Fusion Middleware RCU for Oracle Identity Management (page 7-5)
- Validating the Oracle Identity Management Database Installation (page 7-8)
- What to Do Next (page 7-8)

7.1 Introduction to Installing Databases for Oracle Identity Management

The Oracle Identity Management components in the enterprise deployment use database repositories. This section describes how to perform the following steps:

- Verify the database requirements as described in Plan for Database Requirements (page 4-24).
- Verify all decisions that have been made regarding the database and documented in the *Oracle Fusion Applications Installation Workbook*. See Plan for Database Requirements (page 4-24).

  One or two Oracle Identity Management databases may exist, based on the decision made during the planning phase and documented in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **IDM Database** table, **IDM DB Type** row. See Oracle Identity Management Split Database Configuration (page 4-29). The prerequisites in this section apply to both databases unless stated otherwise.
- Install and configure the Oracle database repositories. See Install Oracle Database (page 7-4).
- Create the required Oracle schemas in the database using the Oracle Fusion Middleware Repository Creation Utility (Oracle Fusion Middleware RCU). See Run the Oracle Fusion Middleware RCU for Oracle Identity Management (page 7-5).

7.2 Prerequisites for Installing Databases for Oracle Identity Management

An overview of databases and their schemas is in Plan for Database Requirements (page 4-24). All details in the sections below apply to those databases.

Before loading the metadata repository into thedatabases, check that they meet the requirements described in these subsections:

- Verify Database Versions Supported (page 7-2)
- Patch the Oracle Database (page 7-2)
- About Initialization Parameters (page 7-3)

7.2.1 Verifying Database Versions Supported

To check if the database is certified or to see all certified databases, see the latest certification information published at https://support.oracle.com.

To determine the version of the installed Oracle Database, execute the following query at the SQL prompt:

```
select version from sys.product_component_version where product like 'Oracle%';
```

7.2.2 Patch the Oracle Database

Patches are required for some versions of Oracle Database. This section describes the patch details for different versions of the Oracle Database.

7.2.2.1 Patch Requirements for Oracle Database 12c

Table 7-1 (page 7-2) lists patches required for Oracle Identity Manager configurations that use Oracle Database 12*c*. Before configuring Oracle Identity Manager 12*c*, be sure to apply the patches to the Oracle Database 12*c* database.

Table 7-1 Required Patches for Oracle Database 12*c*

Platform	Patch Number and Description on My Oracle Support
Linux	7614692: BULK FEATURE WITH 'SAVE EXCEPTIONS' DOES NOT WORK IN ORACLE 11G
Linux	7000281: DIFFERENCE IN FORALL STATEMENT BEHAVIOR IN 11G
Linux	8327137: WRONG RESULTS WITH INLINE VIEW AND AGGREGATION FUNCTION
Linux	8617824: MERGE LABEL REQUEST ON TOP OF 11.1.0.7 FOR BUGS 7628358 7598314

7.2.2.2 Patch Requirements for Oracle Database 12c

If Oracle Database 12*c* is used, make sure to download and install the appropriate version (based on the platform) for the RDBMS Patch Number 10259620. This is a prerequisite for installing the Oracle Identity Manager schemas.

Table 7-2 (page 7-3) lists the patches required for Oracle Identity Manager configurations that use Oracle Database 12*c*. Make sure to download and install the following patches before creating Oracle Identity Manager schemas.

Table 7-2 Required Patches for Oracle Database 12*c*

Platform	Patch Number and Description on My Oracle Support
Linux x86 (64-bit)	RDBMS Interim Patch#10259620.

If this patch is not applied, then problems might occur in user and role search and manager lookup. In addition, search results might return empty result.

Apply this patch in ONLINE mode. Refer to the readme.txt file bundled with the patch for the steps to be followed.

In some environments, the RDBMS Interim Patch has been unable to resolve the issue, but the published workaround works. Refer to the metalink note *Wrong Results on 11.2.0.2 with Function-Based Index and OR Expansion due to fix for Bug:8352378 [Metalink Note ID 1264550.1]* for the workaround. This note can be followed to set the parameters accordingly with the only exception that they need to be altered at the Database Instance level by using `ALTER SYSTEM SET <param>=<value> scope=<memory>` or `<both>`. To query initialization parameters, use the command `SHOW PARAMETERS <parameter-name>`.

7.2.3 About Initialization Parameters

To query database for initialization parameters, run the following command:

```
SHOW PARAMETERS <parameter-name>;
```

The database must have the following minimum initialization parameters defined:

Table 7-3 Minimum Initialization Parameters for the Oracle Database

Parameter	Value
aq_tm_processes	1
dml_locks	200
job_queue_processes	12
open_cursors	1500
session_max_open_files	50
sessions	500
processes	2500

Table 7-3 (Cont.) Minimum Initialization Parameters for the Oracle Database

Parameter	Value
sga_target	4G
pga_aggregate_target	2G
sga_max_size	4G
session_cached_cursors	500
_b_tree_bitmap_plans	FALSE
parallel_max_servers	1
shared_servers	0
_active_session_legacy_behavior	TRUE

The parallel_max_servers parameter is only required for Oracle Internet Directory databases where the Oracle RAC system has more than 32 CPUs

The size of the redo log files is 0.5G. A minimum of 2G for each redo log file is recommended to improve redo log performance.

For guidelines on setting up optimum parameters for the Database, see Tune Database Initialization Parameters in the *Oracle Fusion Applications Administrator's Guide*.

7.3 Oracle Identity Management Database Installation Checklist

Before initiating the Oracle Identity Management database installation, verify the following checklist:

- Necessary infrastructure
  - Access to the database server console is provided for the database OS User as well as root/pseudo access (VNC recommended).
  - The provisioning repository or Oracle database installers are available and accessible from the database nodes.
- Prerequisites for the database server
  - General Oracle database prerequisites have been satisfied.
- Planning
  - *Oracle Fusion Applications Installation Workbook*, **Databases** tab, **Identity Management Database** table has information that is used for the database installation.

7.4 Install Oracle Database

For more information about installing Oracle Database Enterprise Edition with the Wizard, see Install Oracle Database Enterprise Edition with the Wizard (page 8-10).

7.5 Install Oracle Real Application Clusters

Install and configure the database repository as follows:

Oracle Clusterware

- For 10*g* Release 2 (10.2), see Related Documents in the *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for a specific platform.
- For 11*g* Release 1 (11.1), see the Installing Oracle Clusterware in the *Oracle Clusterware Installation Guide* for a specific platform.

Automatic Storage Management

- For 10*g* Release 2 (10.2), see Related Documents in the *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for a specific platform.
- For 11*g* Release 1 (11.1), see the Installing Oracle Clusterware in the *Oracle Clusterware Installation Guide* for a specific platform.
- When the installer is run, select the **Configure Automatic Storage Management** option in the **Select Configuration** screen to create a separate Automatic Storage Management home.

Oracle Real Application Clusters

- For 10*g* Release 2 (10.2), see Related Documents the *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for a specific platform.
- For 11*g* Release 1 (11.1), see Oracle RAC Installation Checklist in the *Oracle Real Application Clusters Installation Guide* for a specific platform.

Oracle Real Application Clusters Database

Create a Real Applications Clusters Database with the following characteristics:

- Database must be in archive log mode to facilitate backup and recovery.
- Optionally, enable the Flashback database.
- Create UNDO tablespace of sufficient size to handle any rollback requirements during the Oracle Identity Manager reconciliation process.
- Database is created with ALT32UTF8 character set.

7.6 Running the Oracle Fusion Middleware RCU for Oracle Identity Management

Unzip the Oracle Fusion Middleware RCU zip file Linux: *`REPOSITORY_LOCATION`*`/installers/fmw_rcu/linux/rcuHome.zip`

or

Windows: *`REPOSITORY_LOCATION`*`/installers/fmw_rcu/windows/rcuHome.zip`

to: *REPOSITORY_LOCATION*/installers/rcu

where *REPOSITORY_LOCATION* is the Oracle Fusion Applications provisioning repository, as described in Create the Oracle Fusion Applications Provisioning Repository (page 5-25).

Use the Oracle Identity Management version of RCU, which now exists in that directory.

The Oracle Fusion Middleware RCU needs to be set up for the ODS and OAM components. Use FA as the prefix for the schema names.

Recommendation for Release 12 is to only use a single database for both ODS and OAM. However, it is recommended to create two separate service names (for the same database instance) and use one service name for OID application and the other for OAM applications. This will be used later in IDM DB Configuration Page (page 10-10).

Select a single password for all the schema while running the Oracle Fusion Middleware RCU.

The Oracle Fusion Middleware RCU is available only on Windows and Linux platforms. For Solaris, install and run the Oracle Fusion Middleware RCU from a Windows or Linux machine.

Run the Oracle Fusion Middleware RCU to create the collection of schemas used by Oracle Identity Management and Management Services.

1. Start the Oracle Fusion Middleware RCU by issuing this command:

   ```
   UNIX: FMW_RCU_HOME/bin/rcu &
   Windows: FMW_RCU_HOME\bin\rcu.bat
   ```

2. On the Welcome screen, click **Next**.
3. On the Create Repository screen, select the **Create** operation to load component schemas into a database. Then click **Next**.
4. On the Database Connection Details screen, provide the information required to connect to an existing database. For example:

   Database Type: `Oracle Database`

   - **Host Name:** Enter one of the Oracle RAC nodes. Enter the VIP address of one of the RAC database nodes or the database SCAN address, for example: `DB-SCAN.mycompany.com`
   - **Port:** The port number for the database listener *(DB_LSNR_PORT)*. For example: `1521`
   - **Service Name:** The service name of the database. For example `OIDEDG.mycompany.com`.
   - **Username:** `sys`
   - **Password:** The sys user password
   - **Role:** `SYSDBA`

   Click **Next**.
5. On the Check Prerequisites screen, click `OK` after the prerequisites have been validated.

6. On the Select Components screen, provide the following values:

   Create a New Prefix: Enter a prefix to be added to the database schemas, for example, enter FA.

   All schemas except for the ODS schema are required to have a prefix. In this release, the Oracle Fusion Middleware RCU prefix must be FA.

   Components: Select the schemas shown in the following table:

Product	Oracle Fusion Middleware RCU Option	Service Name	Comments
Oracle Internet Directory	Identity Management–Oracle Internet Directory	*Oracle Fusion Applications Installation Workbook* - Database tab, IDM Database table, Service name (if not using a separate OID DB) OID Database, Service Name (if using a separate OID DB)	NA
Oracle Access Manager	Identity Management–Oracle Access Manager	*Oracle Fusion Applications Installation Workbook* , Database tab, IDM Database table, Service name	Audit Services is also selected.

   Click **Next**.

   If the topology requires more than one database, the following important considerations apply:

   - Be sure to install the correct schemas in the correct database.
   - Run the Oracle Fusion Middleware RCU more than once to create all the schemas for a given topology, if necessary.
   - Review the tables in Plan for Database Requirements (page 4-24), which provide the recommended mapping between the schemas and their corresponding databases. Refer to Table 4-6 (page 4-28) to ensure that the correct details are entered in this screen.

7. On the Check Prerequisites screen, click **OK** after the prerequisites have been validated.

8. On the Schema Passwords screen, enter the passwords for the schemas. Choose to use either the same password for all the schemas or different passwords for each of the schemas. Oracle recommends choosing different passwords for different schema's to enhance security

   Click **Next**.

9. On the Map Tablespaces screen, accept the defaults and click **Next**.

10. On the confirmation screen, click **OK** to allow the creation of the tablespaces.

11. On the Creating tablespaces screen, click OK to acknowledge creation of the tablespaces.
12. On the Summary screen, the summary and verify that the details provided are accurate. Click **Create** to start the schema creation process.
13. On the Completion summary screen, verify that the schemas were created.

    Click **Close** to exit.

7.7 Validate the Oracle Identity Management Database Installation

To verify if the Oracle Identity Management database installation has been completed successfully, check the following:

- The database is up and running on all nodes.
- The database listener is up and running.
- The database installation includes the required components.
- Use SQL*Plus or another tool to check that the system user is able to connect to the database remotely.
- Run `opatch -lsinventory` on the database to verify that patches have been applied according to the document for the specific platform.
- Complete the manual postinstallation tasks detailed in the database patch readme files. See Complete Database Patch Postinstallation Tasks (page 8-17).
- The password policy has been defined and the passwords defined for the Oracle Identity Management database schemas are in line with the policy.

7.8 Next Steps

When the Oracle Identity Management database installation has been completed, see Install Oracle Fusion Applications Transaction Database (page 8-1) for complete information to install the Oracle Fusion Applications transaction database.

8

Install Oracle Fusion Applications Transaction Database

This section describes how to install and configure a transaction database for use with an Oracle Fusion Applications environment. It also describes the Oracle Fusion Applications Repository Creation Utility (Oracle Fusion Applications RCU), which creates a repository for applications schemas and tablespaces and loads seed data into the database.
This section includes the following topics:

- Introduction to Installing Oracle Fusion Applications Transaction Databases (page 8-1)
- Oracle Fusion Applications Transaction Database Requirements (page 8-3)
- Oracle Fusion Applications Database Installation Checklist (page 8-10)
- Install the Oracle Fusion Applications Transaction Database (page 8-10)
- Oracle Fusion Applications RCU Installation Checklist (page 8-24)
- Run the Oracle Fusion Applications RCU to Create Oracle Fusion Applications Database Objects (page 8-25)
- What to Do Next (page 8-37)

8.1 Introduction to Installing Oracle Fusion Applications Transaction Databases

A **transaction database** holds the business transactions generated as the Oracle Fusion Applications products offerings are used. This section includes overview information related to installing Oracle Database. The Provisioning Wizard installs 12.1.0.2.0 database. For a manual installation of the database, install Oracle Database 12.1.0.2.0.

8.1.1 Process Overview

Install Oracle Database Enterprise Edition on a physical host before creating a response file. The database must be created using the database template that is shipped with Oracle Fusion Applications software. The template contains the database structure and features, but is not seeded. It is generic for use across platforms.

For a small-scale, single-node database, use the **Install an Applications Transaction Database** option in the Provisioning Wizard to install a single-node instance of Oracle Database Enterprise Edition. Or, install the database manually (interactively) for a production-scale, multiple-node database. Oracle Fusion Applications also supports Oracle Real Application Clusters (Oracle RAC).

To finish any database installation, use the Oracle Fusion Applications RCU to perform the following actions:

- Create Oracle Fusion Middleware schema and tablespace users and define the tables, views, and other artifacts that the schema user owns.
- Create empty tablespaces for Oracle Fusion Applications components and the schema owners. The owners do not own any tables or data initially.
- Import default seed data values for the schema users using Oracle Data Pump files.

See Run the Oracle Fusion Applications RCU to Create Oracle Fusion Applications Database Objects (page 8-25) for details about running the Oracle Fusion Applications RCU.

8.1.2 Oracle Data Pump

Oracle Data Pump provides high-speed, parallel, bulk data and metadata movement of Oracle Database contents. The Data Pump dump files (.dmp) that contain the table definitions are delivered as part of the provisioning framework installation to make them available to the Oracle Fusion Applications RCU.

When using Oracle Data Pump to import data and metadata for an Oracle RAC installation, note that the directory that holds the dump files must be accessible from all Oracle RAC nodes. In addition, keep the following considerations in mind:

- To use Data Pump or external tables in an Oracle RAC configuration, ensure that the directory object path is on a cluster-wide file system.

  The directory object must point to shared physical storage that is visible to, and accessible from, all instances where Data Pump and/or external table processes may run.
- The default Data Pump behavior is that worker processes can run on any instance in an Oracle RAC configuration. Therefore, workers on those Oracle RAC instances must have physical access to the location defined by the directory object, such as shared storage media.
- Under certain circumstances, Data Pump uses parallel query workers to load or unload data. In an Oracle RAC environment, Data Pump does not control where these workers run, and they may run on other instances in the Oracle RAC, regardless of what is specified for `CLUSTER` and `SERVICE_NAME` for the Data Pump job. Controls for parallel query operations are independent of Data Pump. When parallel query workers run on other instances as part of a Data Pump job, they also require access to the physical storage of the dump file set.

8.1.3 Single-Node Versus Multiple-Node Databases

A single-node instance of Oracle Database Enterprise Edition is typically used for medium-sized installations, or for training and demonstrations. The Provisioning Wizard database installation interview collects details such as the database listener port and the location of the database home, the database software, the database files, the database password, and the global name of the database. The wizard performs prerequisite validation checks, reports the status of the checks, and summarizes the actions to be performed during the database installation.

Oracle Real Application Clusters (Oracle RAC) enables multiple database instances, linked by an interconnect, to share access to Oracle Database. This configuration enables to increase the scale of the applications environment. This type of database is typically used for production environments.

8.2 Oracle Fusion Applications Transaction Database Requirements

This section describes the requirements for Oracle Fusion Applications transaction databases. Read and understand the information in the following sections and perform any tasks outlined there before beginning a database installation.

8.2.1 General Oracle Database Prerequisites

General Oracle database prerequisites must be satisfied before proceeding with the database installation for Oracle Fusion Applications. See the Oracle Database Installation Guide for the required prerequisites and pre-installation tasks. Use the guide that corresponds to the platform the database is running on http://docs.oracle.com/database/122/nav/install-and-upgrade.htm.

8.2.2 Specific Oracle Fusion Applications Prerequisites

The following prerequisites are specific to Oracle Fusion Applications:

- The provisioning repository must be created, see Create the Oracle Fusion Applications Provisioning Repository (page 5-25).
- Do not share the same database instance for Oracle Identity Management and Oracle Fusion Applications. Oracle Fusion Applications should be in a separate database instance.
- The database instance must also be running on a physical host.
- Even if performing a manual database installation, install the Oracle Fusion Applications provisioning framework (see Install the Oracle Fusion Applications Provisioning Framework (page 6-5)) to obtain the DBCA template needed for the database creation.
- If performing a manual install, the appropriate DBCA template from the Provisioning Framework must be copied to the database host.
- Ensure there is enough free disk space for Oracle Fusion Applications database tablespaces.
- Designate a Linux or Windows server for the Oracle Fusion Applications RCU if installing Oracle Fusion Applications on another platform.

  The Oracle Fusion Applications RCU is supported only on Linux x86-64 and Microsoft Windows x64 (64-bit) platforms. However, it can run from any host that can access the database, it does not have to run from the database server itself. So, if the database is installed on other platforms, start the Oracle Fusion Applications RCU from the supported Linux x86-64 and Microsoft Windows x64 (64-bit) platforms to connect to the database.
- Download database software and patches separately if the database platform is different from the Fusion Applications platform.

  If the database platform is different from the platform Oracle Fusion Applications and Oracle Identity Management are running on, the Provisioning Framework and the Oracle Database installer and patches that ship as part of the Oracle Fusion Applications installers cannot be used and it is recommended to download the

Oracle Database software and patches for that specific platform and perform the database install manually.

8.2.3 Oracle Fusion Applications Database Requirements

Read and understand the information in the following sections and perform any tasks outlined there during or after a database installation, before running the Oracle Fusion Applications RCU.

For more information about database installation requirements, see Certification in the *Oracle Fusion Applications Release Notes*. The Provisioning Wizard performs prerequisite validation checks to ensure that those requirements are met.

MANDATORY: Before installing Oracle database using the Oracle Fusion Applications Provisioning Wizard, shut down all Oracle and Oracle-related services on the database host. Failure to do so results in database installation errors.

8.2.3.1 Components

Oracle Fusion Applications requires Oracle Database Enterprise Edition or Oracle Real Application Clusters Database. If Oracle Database Enterprise Edition installer is installed manually (not using the provisioning Wizard), the installation requires the enabling of specific components, several of which are selected by default:

- Oracle Partitioning (default)
- Oracle Data Mining RDBMS Files (default)

To verify that the system meets all minimum requirements associated with the database, see the Oracle Database Installation Guide for details about a specific platform.

8.2.3.2 Minimum Configuration Parameters for Oracle Database

Table 8-1 (page 8-4) shows the commonly recommended initialization parameters.

Table 8-1 Recommended Initialization Parameters

Expected Database Size	Parameter Name	DB Default Value	Recommended Value for Oracle Fusion Applications
Small and large	`audit_trail`	NONE	DB, EXTENDED
Small and large	`plsql_code_type`	INTERPRETED	NATIVE
Small and large	`nls_sort`	Derived from NLS_LANGUAGE	BINARY
Small and large	`open_cursors`	50	500
Small and large	`session_cached_cursors`	50	500
Small and large	`_b_tree_bitmap_plans`	TRUE	FALSE
Small and large	`db_securefile`	PERMITTED	ALWAYS
Small and large	`disk_asynch_io`	TRUE	TRUE

Table 8-1 (Cont.) Recommended Initialization Parameters

Expected Database Size	Parameter Name	DB Default Value	Recommended Value for Oracle Fusion Applications
Small and large	filesystemio_options	Platform Dependent ("none" for Linux)	Use default value ("none" for Linux)
Small and large	SYSTEM	1900	1900
Small and large	SYSAUX	1100	1100
Small and large	parallel_max_servers	8	12
Small and large	job_queue_processes	8	12
Small and large	RESOURCE_MANAGER_PLAN	NONE	FUSIONAPPS_PLAN
Small and large	AUDIT_SYS_OPERATIONS	TRUE	FALSE
Small and large	parallel_force_local	N/A	TRUE
Small and large	parallel_adaptive_multi_user	N/A	FALSE
Small and large	_optimizer_batch_table_access_by_rowid	N/A	FALSE
Small and large	event	N/A	45053 trace name context forever, level 127
Starter - Single-node, small	sga_target	0	9 GB
Starter - Single-node, small	pga_aggregate_target	0	4 GB
Starter - Single-node, small	_fix_control	5483301:ON,6708183:OFF	14545269:OFF,14764860:ON,6708183:ON,17799716:ON,19710102:ON,18134680:ON
Starter - Single-node, small	processes	100	5000
Starter - Single-node, small	undo tablespace	0	6 GB; autoextend ON
Starter - Single-node, small	temp tablespace	0	6 GB; autoextend ON
Starter - Single-node, small	redo log	0	Three 2 GB Groups
Starter - Single-node, small	SYSTEM	1900	1900
Starter - Single-node, small	SYSAUX	1100	1100
Starter - Single-node, small	parallel_max_servers	12	12
Starter - Single-node, small	job_queue_processes	12	12

Table 8-1 (Cont.) Recommended Initialization Parameters

Expected Database Size	Parameter Name	DB Default Value	Recommended Value for Oracle Fusion Applications
Starter - Single-node, small	RESOURCE_MANAGER_PLAN	NONE	FUSIONAPPS_PLAN
Starter - Single-node, small	AUDIT_SYS_OPERATIONS	TRUE	FALSE
Starter - Single-node, small	pga_aggregate_limit	N/A	0
Starter - Single-node, small	db_cache_size	N/A	2GB
Starter - Single-node, small	shared_pool_size	N/A	2GB
Single-node, large	sga_target	0	18 GB
Single-node, large	pga_aggregate_target	0	8 GB
Single-node, large	_fix_control	5483301:ON,6708183:OFF	14545269:OFF,14764860:ON,6708183:ON,17799716:ON,19710102:ON,18134680:ON
Single-node, large	processes	100	5000
Single-node, large	undo tablespace	0	12 GB; autoextend ON
Single-node, large	temp tablespace	0	9 GB; autoextend ON
Single-node, large	redo log	0	Three 2 GB Groups
Single-node, large	SYSTEM	1900	1900
Single-node, large	SYSAUX	1100	1100
Single-node, large	parallel_max_servers	8	12
Single-node, large	job_queue_processes	8	12
Single-node, large	RESOURCE_MANAGER_PLAN	NONE	FUSIONAPPS_PLAN
Single-node, large	AUDIT_SYS_OPERATIONS	TRUE	FALSE
Single-node, large	pga_aggregate_limit	N/A	0
2-node Oracle RAC, large	sga_target	0	18 GB

Table 8-1 (Cont.) Recommended Initialization Parameters

Expected Database Size	Parameter Name	DB Default Value	Recommended Value for Oracle Fusion Applications
2-node Oracle RAC, large	pga_aggregate_target	0	8 GB
2-node Oracle RAC, large	_fix_control	5483301:ON,6708183:OFF	14545269:OFF,14764860:ON,6708183:ON,17799716:ON,19710102:ON,18134680:ON
2-node Oracle RAC, large	processes	100	5000
2-node Oracle RAC, large	undo tablespace	0	12 GB; autoextend ON
2-node Oracle RAC, large	temp tablespace	0	9 GB; autoextend ON
2-node Oracle RAC, large	redo log	0	Three 2 GB Groups per instance
2-node Oracle RAC, large	SYSTEM	1900	1900
2-node Oracle RAC, large	SYSAUX	1100	1100
2-node Oracle RAC, large	parallel_max_servers	8	12
2-node Oracle RAC, large	job_queue_processes	8	12
2-node Oracle RAC, large	RESOURCE_MANAGER_PLAN	NONE	FUSIONAPPS_PLAN
2-node Oracle RAC, large	AUDIT_SYS_OPERATIONS	TRUE	FALSE
2-node Oracle RAC, large	pga_aggregate_limit	N/A	0

WARNING:

When the Provisioning Wizard is used to install the database using the dbca template, the default values for the `disk_asynch_io` and `filesystemio_options` parameters are as follows:

`disk_asynch_io` is set to TRUE

`filesystemio_options` is set to the default value based on the platform where the database is installed. It could be either *none*, *setall*, *asynch*, or *diskio*. To verify that the `filesystemio_options` parameter is using the default value, run the following query: "`select isdefault from v$parameter where name='filesystemio_options`". If it returns TRUE, the default value is set.

If the parameter value is changed from the original default value to another value and then change it back to the original default value, the default value still remains FALSE.

The following Warning messages is displayed based on the values set:

If `disk_asynch_io` is set to FALSE and `filesystemio_options` is set to the default value, a Warning message is displayed recommending setting the value for disk_asynch_io to TRUE.

If `disk_asynch_io` is set to FALSE and `filesystemio_options` is not set to the default value, a Warning message is displayed recommending setting the value for `disk_asynch_io` to TRUE for the best performance optimization.

Due to the addition of Fusion Applications Read Only Diagnostic schemas, the database audit trail is turned on via the `audit_trail=DB, EXTENDED` initialization parameter to monitor all database activities with the `FUSION_RO` and `FUSION_ERO` schema users. To minimize impact to performance, it is also recommended that auditing system operations be excluded via the `AUDIT_SYS_OPERATIONS = FALSE` initialization parameter. Furthermore, if the Fusion Applications database is created manually (and the Provisioning Wizard is not used) it is recommended to move the `AUDIT` segment from the `SYSTEM` tablespace to the `SYSAUX` tablespace and create a custom index for audit. Do so as a post installation task after provisioning the Oracle Fusion Applications Environment.

For more information about setting the kernel parameter value, see Set the Kernel Parameter Value (page 5-10).

8.2.3.3 Tuning Oracle Database

For more information about tuning Oracle database, see Manage Oracle Database for Oracle Fusion Applications in the *Oracle Fusion Applications Administrator's Guide*.

8.2.3.4 Mandatory Oracle Database Patches

Table 8-2 (page 8-8) lists the mandatory Oracle Database (Enterprise Edition and RAC) patches required for Oracle Fusion Applications. The list is organized by operating system platforms.

- If Oracle Database is installed using the Provisioning Wizard, these patches are automatically applied.
- If Oracle Database is installed manually, apply the mandatory database patches by following the instructions detailed in Run RUP Lite for RDBMS (page 8-22).

For both scenarios described above, ensure that the following steps are completed before running the Oracle Fusion Applications RCU:

- Complete the manual postinstallation tasks detailed in the patch readme file (Complete Database Patch Postinstallation Tasks (page 8-17)).
- Refer to Oracle Database patch details listed in Additional Patches for the Tech Stack in the latest *Oracle Fusion Applications Release Notes* for any additional patches required for the current release.

Table 8-2 Mandatory Oracle Database Patches

Operating System	Patches
linux64	12.1.0.2.161223FA-DBBP

Table 8-2 (Cont.) Mandatory Oracle Database Patches

Operating System	Patches
solaris64	12.1.0.2.161223FA-DBBP
solaris_sparc64	12.1.0.2.161223FA-DBBP

8.2.3.5 DBA Directories

Create directories in the file system accessible by the database which is referenced by the DBA directories used by Oracle Fusion Applications. These directories are specified in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA transaction Database** table and they are:

- `RCU APPLCP_FILE_DIR`
- `RCU APPLLOG_DIR`
- `RCU FUSIONAPPS_PROV_RECOVERY_DIR` (OBIEE Backup Dir)
- `RCU OTBI_DBINSTALL_DUMP_DIR` (OTBI Dump File Directory)
- `RCU FUSIONAPPS_DBINSTALL_DP_DIR` (FA Dump File Directory)

For more information about the specific requirements for these directories, see Oracle Fusion Applications RCU Directories (page 4-28).

8.2.3.6 Make Oracle Fusion Applications RCU Software Available on the Host where it is Run

Complete the following steps to make the Oracle Fusion Applications software available in the host where it is run.

- Locate the appropriate Oracle Fusion Applications RCU software for a specific platform. For Linux, go to *`REPOSITORY_LOCATION`*`/installers/apps_rcu/linux` to find the rcuHome_fusionapps_linux.zip file. For Windows, go to *`REPOSITORY_LOCATION`*`/installers/apps_rcu/windows` and locate the `rcuHome_fusionapps_win.zip` file. These files were staged when the installer repository was created.
- Extract the contents of `rcuHome_fusionapps_linux.zip` (or `rcuHome_fusionapps_win.zip`) to a directory (`APPS_RCU_HOME`) on a Windows or Linux machine where the Oracle Fusion Applications RCU is run. All dependent components that the Oracle Fusion Applications RCU needs are included in this zipped file.

8.2.3.7 Make dmp Files Available on the Database Server

Complete the following steps to make dmp files available on the database server. If the Oracle Fusion Applications database is configured as multiple RAC nodes, make sure the dmp files are accessible from all RAC nodes.

- Locate the file *`APPS_RCU_HOME`*`/rcu/integration/fusionapps/export_fusionapps_dbinstall.zip`.

- Unzip `export_fusionapps_dbinstall.zip` to the directory specified for `FUSIONAPPS_DBINSTALL_DP_DIR`.
- Go to *`APPS_RCU_HOME`*`/rcu/integration/biapps/schema` and locate the `otbi.dmp` file.
- Copy `otbi.dmp` to `OTBI_DBINSTALL_DUMP_DIR`.

8.3 Oracle Fusion Applications Database Installation Checklist

Before initiating the Oracle Fusion Applications database installation process, verify the following checklist:

- Necessary infrastructure
  - Access to the database server console is provided for the database OS user as well as root/pseudo access (VNC recommended).
  - The provisioning repository or Oracle database installers are available and accessible from the database nodes.
  - Database patches are available and accessible from the database nodes.
  - The Oracle Fusion Applications Provisioning Framework has been installed.
  - (Wizard Install only) The Oracle Fusion Applications Provisioning Wizard can be run from the database host.
  - (Manual Install only) The appropriate DBCA template from the Provisioning Framework has been copied to the database host.
- Prerequisites for the database server
  - General Oracle database prerequisites have been satisfied.
- Planning
  - *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table has been filled out with information that will be used for the database installation.

8.4 Install the Oracle Fusion Applications Transaction Database

Install the Oracle Fusion Applications transaction database using the provisioning wizard or manually as described in this section.

- Install Oracle Database Enterprise Edition with the Wizard (page 8-10)
- Manual Installation of Oracle Database Enterprise Edition or Oracle RAC (page 8-17)

8.4.1 Install Oracle Database Enterprise Edition with the Wizard

As a part of the provisioning process, the Provisioning Wizard performs prerequisite and validation checks. These validations must pass before creating a response file.

User Input Validations

The Provisioning Wizard:

- Validates the service name or global database name.
- Validates the installer location. In the Preverify phase, validates that the database is present.
- Validates that the database password value and the password confirmation match.
- Performs specific user ID and password validations for all Oracle Fusion Middleware schema owners.

Preinstallation Validations

The Provisioning Wizard:

- Checks to see if the specified database file location has sufficient disk space for the initial database provisioning and performs an Oracle home space check.
- Performs a port availability check.
- Performs a platform check. There is no validation that specific platform packages have been installed.

Postinstallation Validations

The Provisioning Wizard ensures that a JDBC connection can be established.

Install a single-node instance of Oracle Database Enterprise Edition using the Provisioning Wizard. The wizard uses the database template delivered with the software. The database is initially empty. After the installation is complete, the Provisioning Wizard has applied the required database patches for Oracle Fusion Applications automatically. However, run any manual postinstallation tasks that are required by the database patches as described in the patch's readme files, then run the Oracle Fusion Applications RCU to create schemas and tablespaces. For more information about manual postinstallation tasks, see Complete Database Patch Postinstallation Tasks (page 8-17).

The wizard invokes the database build script and performs the following tasks:

- Installs database software.
- Generates an Oracle Universal Installer (OUI) response file based on the configuration specified.
- Accesses the provisioning repository and invokes the database installer in silent mode. If the applications environment does not meet the database installation requirements, the wizard terminates the process.
- Requests a copy of the nonseeded database template.
- Creates an instance of Oracle Database12.1.0.2.0 using the configuration settings entered in the wizard interview, and the database template.

8.4.1.1 Start the Provisioning Wizard

Note the following requirement when installing a transaction database on a UNIX platform:

- Verify that the length of the PATH environment variable is less than 900 characters. Use this command to check the character count:

  ```
  env | grep ^PATH= | wc -m
  ```

To start the Provisioning Wizard, do the following:

1. Set the *JAVA_HOME* environment variable to point to the JDK location in the provisioning repository, for example:

   UNIX:

   ```
   export JAVA_HOME=REPOSITORY_LOCATION/jdk
   ```

   > **Tip:**
   >
   > For the *REPOSITORY_LOCATION* value, see *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Temporary Shared Storage** table, **Installers Directory Location** row.

   ```
   export PATH=$JAVA_HOME/bin:$PATH
   ```

2. Verify that the `LIBPATH` value is null.
3. Run the following command on the machine where the database is planned to reside:

   UNIX:

   > **Tip:**
   >
   > For the *FAPROV_HOME* value, see *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **FA Provisioning Framework Location** row.

   ```
   ./provisioningWizard.sh
   ```

   Solaris:

   Use `bash provisioningWizard.sh` instead of `./provisioningWizard.sh`.

8.4.1.2 Wizard Interview Screens and Instructions

Table 8-3 (page 8-12) shows the steps necessary to install a transaction database. For help with any of the interview screens, click **Help**.

If the values required are not entered correctly, the error and warning messages are displayed at the bottom of the screen.

Table 8-3 Interview Flow for Database Installation

Screen	Description and Action Required
Welcome	No action is required on this read-only screen. Click **Next** to continue.

Table 8-3 (Cont.) Interview Flow for Database Installation

Screen	Description and Action Required
Specify Central Inventory Directory	This screen displays only if one or more of the following conditions are not met: • The `-invPtrLoc` option is used to specify the central inventory location. Thus, the default value for the platform is not used. Note that the default value for Linux platforms is `/etc/oraInst.loc`. For Solaris, the default value is `/var/opt/oracle/oraInst.loc`. • The Central Inventory Pointer File is readable. • The Central Inventory Pointer File contains a value for `inventory_loc`. • The `inventory_loc` directory is writable. • The `inventory_loc` directory has at least 150K of space. • `inventory_loc` is not an existing file. Specify the location of the **Central Inventory Directory** that meets the previous criteria. The `inventory_loc` directory can be created by the `createCentralInventory.sh` script and does not have to exist at the time its location is specified. **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook* , **Storage**, tab **Inventories** table, **FA Provisioning Framework** row. For non-Windows platforms, in the **Operating System Group ID** field, select or enter the group whose members are granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook* , **Storage** tab, **Shared Storage** table, **FA Shared** row, **OS Group Owner** column. The **Inventory Location Confirmation** dialog prompts to run the *`inventory_directory`*`/createCentralInventory.sh` script as root, to confirm that all conditions are met and to create the default inventory location file, such as `/etc/oraInst.loc`. After this script runs successfully, return to the interview and click **OK** to proceed with the installation. To continue the installation without root access, select **Continue installation with local inventory**. Click **OK** to proceed with the installation. Click **Next** to continue.
Installation Options	Presents the list of valid installation actions that can be performed using the wizard. Select **Install an Applications Transaction Database**. Click **Next** to continue.

Table 8-3 (Cont.) Interview Flow for Database Installation

Screen	Description and Action Required
Specify Security Updates	Set up a notification preference for security-related updates and installation-related information from My Oracle Support. This information is optional. • **Email**: Enter a valid email address to have updates sent by this method. • **Agree to receive security updates via My Oracle Support**: Select this option to have updates sent directly to a My Oracle Support account. Enter a valid **My Oracle Support Password** if this option is selected. **Note:** If invalid My Oracle Support (MOS) credentials are provided, a dialog box is displayed informing that the user will be anonymously registered. Complete the following steps before continuing with provisioning the new environment: 1. Cancel and exit the Provisioning Wizard. 2. Obtain the correct MOS credentials. 3. Restart the Provisioning Wizard to update the provisioning response file with the correct MOS credentials or uncheck the checkbox next to **I wish to receive security updates via My Oracle Support**. Save the provisioning response file and then exit the Provisioning Wizard. 4. Restart the Provisioning Wizard to provision the Oracle Fusion Applications environment. Click **Next** to continue.
Database Install Configuration	Specify the configuration details about the database that is being installed. See Specify Database Installation Parameters (page 8-15). Click **Next** to continue.
Prerequisite Checks	The **Prerequisite Checks** list shows each prerequisite check performed. The status of the prerequisite checking can be one of the following: • **Block**: Processing has not yet started on this host for the named phase. • **Clock**: Performing the build for a phase. • **Check mark**: The build was completed successfully. • **x** mark: The build has failed for this phase. Correct the errors before continuing. • **Restricted** symbol: The validation process has stopped due to a failure within another process. Click an **x** or a **Restricted** symbol to display information about failures. Click the **Log** file for details about the validation. Fix any issues reported. Click **Retry** to run the prerequisite checks again. If recovery is necessary, see Troubleshooting Oracle Fusion Applications Database Installation and Oracle Fusion Applications RCU Operations (page 9-1). When prerequisite checking has finished with no errors, click **Next** to continue.
Summary	Click **Save** to create and save a text file to use as a record of this configuration. Click **Install** to start the installation. **Note**: Record the name and location of the file. Supply these details when the response file is being created.

Table 8-3 (Cont.) Interview Flow for Database Installation

Screen	Description and Action Required
Database Installation Progress	The installation **Progress** is reported by phase: • **Preconfigure**: Applies patches to the installed database. The patches are located in the *repository_location*`/installers/database/patch directory`. • **Configure**: Creates services used to connect to the database and applies the database template to set system parameters. • **Postconfigure**: Performs any necessary postconfigure steps. • **Startup**: Starts any installed components that are not already started. • **Validation**: Connects to the database to verify the integrity of the installation. The progress of the installation phases is listed. A message appears after the installation phase is complete directing to run `root.sh`. Follow this instruction and click **OK** to continue the installation. The central log file location is displayed below the **Progress** bar. Click a **Log** icon to view phase log files. Click **Retry** if a failure occurs. If recovery is necessary, see Troubleshoot Oracle Fusion Applications Database Installation and Oracle Fusion Applications RCU Operations (page 9-1). Click **Next** to continue.
Installation Complete	A summary of the actions and validations performed for this installation is presented. Click **Save** to record the database summary information in a text file. Record the name and location of this file. Supply these details when a response file is created. The system administrator may also need this information as they perform maintenance tasks. Click **Close** to dismiss the screen and exit the wizard.

8.4.1.3 Specify Database Installation Parameters

On the **Database Install Configuration** interview screen, specify values for these database configuration parameters.

- **Database Listener Port**: The port number designated for the database server. The default port for Oracle Database is 1521.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **FA DB Instances** row.

- **Installers Directory Location**: Enter the path to the *`REPOSITORY_LOCATION`* directory created when the provisioning repository was downloaded.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Temporary Shared Storage** table, **Installers Directory Location** row.

- **Oracle Base**: Enter the top-level directory for Oracle software installations. The path can be changed based on the requirements.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **FA DB Oracle Home** (The ORACLE_BASE is part of the ORACLE_HOME).

- **Software Location**: Accept the default value or enter the Oracle home directory path that points to where the data files reside. The directory path must not contain spaces.

> **Tip:**
>
> This field is automatically filled. This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **FA DB Oracle Home** row.

- **Database File Location**: Accept the default value or enter the path to the .dbf, .dtl, and .log files.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **FA DB Datafiles Location** row.

- **OSDBA Group**: The UNIX operating system group that the database administrator is a member of. This field is displayed only if the platform detected by the installer is UNIX.

> **Tip:**
>
> If the database is installed on the FA shared storage as defined in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Shared Storage** table, **FA Shared** row, **OS Group Owne**r column.

- **Global Database Name**: Enter a name to distinguish this database instance from other Oracle Database instances running on the same host. The name can be

written as *database name* or *database name*.*domain name*. This is the database service name.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **FA DB Service Name**row.

- **Administrative Password**: Specify a valid password. Retype the password to **Confirm**.

8.4.1.4 Complete Database Patch Postinstallation Tasks

After the database installation, run the `datapatch` utility as the only postinstallation task. The `datapatch` utility is run using the following command:

```
sh $ORACLE_HOME/OPatch/datapatch
```

8.4.2 Manual Installation of Oracle Database Enterprise Edition or Oracle RAC

Though Oracle Fusion Applications Provisioning automates the installation and configuration of a transaction database for use with Oracle Fusion Applications environments, manually install a single-node instance of Oracle Database or Oracle Real Application Clusters to meet specific requirements.

To manually install and configure a transaction database, complete the following steps:

1. Install Oracle Database or Oracle RAC (page 8-17)
2. Configure OCM (page 8-18)
3. Configure and Start the Database Listener for Oracle Database (NETCA) (page 8-18)
4. Create a Transaction Database Instance Using Oracle Database Configuration Assistant (DBCA) (page 8-18)
5. Run RUP Lite for RDBMS (page 8-22)
6. Complete Database Patch Postinstallation Tasks (page 8-22)

8.4.2.1 Install Oracle Database or Oracle RAC

The first step in creating a custom transaction database instance is to install the database software.

How to Install Oracle Database

If Oracle Database is being installed manually (interactively) instead of using the Provisioning Wizard, see the Oracle Database Installation Guide for details about a specific platform.

When performing the installation, ensure that the following components are enabled:

- Oracle Partitioning (default)
- Oracle Data Mining RDBMS Files (default)

If these components are not enabled, application functionality does not work.

When performing the installation, choose the **Software Only** option. Create the database instance manually and configure the database.

To verify that the system meets all minimum requirements associated with the database, see the Oracle Database Installation Guide for details about a specific platform.

How to Install Oracle RAC

For complete information about installing and configuring Oracle RAC, see the Oracle Database Installation Guide for details about a specific platform. This library contains installation guides for Oracle RAC, as well as Oracle Database installations for all platforms.

MANDATORY: For a RAC database, the passwords for all schemas must be the same across all RAC instances.

When Oracle RAC is installed, note that by default the database listener creates a log file in the grid ORACLE_HOME, that is, GRID_HOME. If the GRID_HOME and database instance owners are different, and if the database listener is started by the database instance operating system user from the GRID_HOME, then set diagnostic destination for the listener in the `listener.ora` file to avoid any core dump issues in the Web Tier host by adding the following line: `ADR_BASE_<name of the LISTENER>=<a file path / location where the database instance owner has the read/write permission>`

8.4.2.2 Configure OCM

For more information about configuring OCM, see Introduction to Oracle Configuration Manager in the *Oracle Configuration Manager Installation and Administration Guide.*

8.4.2.3 Configure and Start the Database Listener for Oracle Database (NETCA)

- Configure the database listener as described in the Oracle 11*g* Release 2 Documentation Library.
- After completing the configuration, start the database listener.

8.4.2.4 Create a Transaction Database Instance Using Oracle Database Configuration Assistant (DBCA)

Use the Oracle Database Configuration Assistant (DBCA) to create the transaction database from the database template that is shipped with Oracle Fusion Applications software. This template contains the database structure and features, but is not seeded. It is generic for use across platforms.

Instructions on database installation and configuration can be found in the Oracle 12*c* Release 1 Documentation Library.

If the database template is not used, ensure that the database configuration parameters are aligned with the values specified in Minimum Configuration Parameters for Oracle Database (page 8-4).

Use DBCA to manually create an instance of Oracle Database from the nonseeded database template that is shipped with Oracle Fusion Applications software.

To create a single-node Oracle Database instance:

1. Review and edit the nonseeded database template at *FAPROV_HOME*/provisioning/template/dbca/empty_database_12.1.dbt or empty_database_12.1.large.dbt (for a large database instance).
2. Navigate to the database *ORACLE_HOME*/bin directory and execute the following command. Make appropriate changes based on the selected database template.

```
dbca -silent -createDatabase -templateName\
FAPROV_HOME/provisioning/template/dbca/empty_database_12.1.large.dbt  \
-gdbName "ORACLE_SID" \
-sid "ORACLE_SID" \
-sysPassword "SYS_PASSWORD" \
-systemPassword "SYSTEM_PASSWORD" \
-emConfiguration "NONE" \
-characterSet "AL32UTF8" - \
-nationalCharacterSet "AL16UTF16" \
-variables ORACLE_BASE=ORACLE_BASE, ORACLE_HOME=ORACLE_HOME \
-datafileDestination DATAFILE_LOC
```

   Use the following steps to set the AUDIT_TRAIL parameter:

   a. Login to SQL*Plus using the sys as sysdba identity.
   b. Run the following command to set AUDIT_TRAIL parameter: `alter system set AUDIT_TRAIL=db,extended scope=spfile;`
   c. Restart the database by running the following commands:

```
shutdown immediate
startup
```

   Replace the following variables with the appropriate values:

   - *FAPROV_HOME*: Home of Oracle Fusion Applications Provisioning framework.
   - *ORACLE_SID*: Global database name of the Oracle Fusion Applications database.
   - *SYS_PASSWORD*: Password for the SYS user. The SYS schema is the location of base tables and views.
   - *SYSTEM_PASSWORD*: User SYSTEM password. The user can create additional tables and views.
   - *ORACLE_BASE*: Top-level directory for the database installation.
   - *ORACLE_HOME*: Oracle home of the database installation.
   - *DATAFILE_LOC*: Physical location of the files that store the data of all logical structures in the database.

How to Create an Oracle RAC Database Instance from the Template

Use DBCA to manually create a database instance for each Oracle RAC node using the nonseeded database template that is shipped with Oracle Fusion Applications software.

To create an Oracle RAC database instance:

1. Review and edit the nonseeded database template at *FAPROV_HOME*/provisioning/template/dbca/empty_database_12.1.dbt or empty_database_12.1.large.dbt (for a large database instance).
2. For each RAC node, navigate to the database *ORACLE_HOME*/bin directory of the RAC node and execute the following command. Make appropriate changes based on the selected database template.

```
dbca -silent -createDatabase \
-templateName  FAPROV_HOME/provisioning/template/dbca/
empty_database_12.1.dbt  \
-gdbName "ORACLE_SID" \
-sid "ORACLE_SID" \
-sysPassword "SYS_PASSWORD" \
-systemPassword "SYSTEM_PASSWORD" \
-emConfiguration "NONE" \
-characterSet "AL32UTF8" - \
-nationalCharacterSet "AL16UTF16" \
-variables ORACLE_BASE=ORACLE_BASE, ORACLE_HOME=ORACLE_HOME \
-datafileDestination DATAFILE_LOC \
-nodeinfo node1,node2
```

   Use the following steps to set the AUDIT_TRAIL parameter:

   a. Login to SQL*Plus using the sys as sysdba identity.
   b. Run the following command to set AUDIT_TRAIL parameter: `alter system set AUDIT_TRAIL=db,extended scope=spfile;`
   c. Restart the database by running the following commands:

```
shutdown immediate
startup
```

   Replace the following variables with the appropriate values:

   - *FAPROV_HOME*: Home of Oracle Fusion Applications Provisioning framework.
   - *ORACLE_SID*: Global database name of the Oracle Fusion Applications database.
   - *SYS_PASSWORD*: Password for the SYS user. The SYS schema is the location of base tables and views.
   - *SYSTEM_PASSWORD*: User SYSTEM password. The user can create additional tables and views.
   - *ORACLE_BASE*: Top-level directory for the database installation.
   - *ORACLE_HOME*: Oracle home of the database installation.
   - *DATAFILE_LOC*: Physical location of the files that store the data of all logical structures in the database.

   MANDATORY: In the nonseeded database template, the following common attributes required by the Oracle Fusion Applications RCU must be set as follows:

```
<option name="OMS" value="true"/>
<option name="JSERVER" value="true"/>
<option name="SPATIAL" value="true"/>
<option name="IMEDIA" value="true"/>
<option name="XDB_PROTOCOLS" value="true">
<tablespace id="SYSAUX"/>
</option>
<option name="ORACLE_TEXT" value="true">
<tablespace id="SYSAUX"/>
</option>
<option name="SAMPLE_SCHEMA" value="false"/>
<option name="CWMLITE" value="false">
<tablespace id="SYSAUX"/>
</option>
<option name="EM_REPOSITORY" value="true">
<tablespace id="SYSAUX"/>
</option>
<option name="APEX" value="false"/>
<option name="OWB" value="false"/>
<option name="DV" value="false"/>
```

8.4.2.5 Enable Database Audit

Perform these steps to enable database audit for the Oracle Fusion Applications database.

1. Move audit segments from SYSTEM to SYSAUX tablespace: Execute the following sql commands as sys:

```
begin
dbms_audit_mgmt.set_audit_trail_location(
audit_trail_type => dbms_audit_mgmt.audit_trail_db_std,
audit_trail_location_value => 'SYSAUX');
end;
/
begin
dbms_audit_mgmt.set_audit_trail_location(
audit_trail_type => dbms_audit_mgmt.audit_trail_fga_std,
audit_trail_location_value => 'SYSAUX');
end;
/
```

2. Create a custom index for audit segment on SYS.AUD$table: Execute the following sql command as sys:

```
create index sys.i_aud3 on sys.aud$(ntimestamp#) tablespace SYSAUX;
```

8.4.2.6 Run RUP Lite for RDBMS

See Run RUP Lite for RDBMS in a Single Instance Database in the *Oracle Fusion Applications Upgrade Guide*.

8.4.2.7 Complete Database Patch Postinstallation Tasks

See Complete Database Patch Postinstallation Tasks (page 8-17).

8.4.3 Validate the Oracle Fusion Applications Database

To verify if the Oracle Fusion Applications database installation has been completed successfully, check the following:

- The database is up and running on all nodes.

  To check the database status:

  ```
  srvctl status database -d <db service name>
  ```

- The database listener is up and running.

  To check the listener status:

  ```
  $ORACLE_HOME/bin/lsnrctl status <listener-name>
  ```

  To start listener:

  ```
  $ORACLE_HOME/bin/lsnrctl start <listener-name>
  ```

- The database installation includes the required components.

  Validation Task 1: Validating the Database Installation

  Verify that the database installation includes the required components.

  Prerequisites

  The only prerequisite is that the database has been installed according to the instructions in Install Oracle Database Enterprise Edition with the Wizard (page 8-10).

  How to Validate the Database Installation

  Verify that all the required components have been installed.

  – Correct version of Enterprise Edition or RAC
  – Oracle Partitioning
  – Data Mining

  Verify that the components are correctly installed via any of the following methods.

  – Run the following query from SQL*Plus:

    ```
    select * from PRODUCT_COMPONENT_VERSION;
    ```

  – Run the following query from SQL*Plus:

```
select COMP_NAME, VERSION, STATUS from dba_registry;
```

– Start SQL*Plus and examine the initial output that lists the installed options.

Expected Results

All components should be present in the installed database directory.

The queries return a list of installed components along with version and status, such as the following:

```
Connected to:
Oracle Database 11g Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Data Mining
and Real Application Testing options
```

Corrective Actions

Install any missing components.

1. Run the database installation wizard.
2. Make sure to select all the required components.

See Installing Oracle Database Enterprise Edition with the Wizard (page 8-10).

- Use SQL* Plus or another tool to check that the system user is able to connect to the database remotely.
- Ensure that the minimum database parameters have been configured.

Validation Task 2: Verifying Database Parameter Configuration

Verify that the minimum database parameters have been configured.

Prerequisites

Make sure Validation Task 1: Validating the Database Installation has been completed.

How to Verify the Configuration of Database Parameters

Review the initialization parameters listed in Table 8-1 (page 8-4) to those in the installed database. Update any initialization parameters to meet minimum requirements as necessary.

– Login to SQL*Plus using the sys as sysdba identity.

– Run either of the following commands.

To check a parameter value:

```
show parameter <parameter>
```

To update a parameter value:

```
alter system set <parameter> = <value>
```

For example:

```
alter system set processes = 1500 scope = SPFILE
```

Adding the scope directive writes the updated parameter value to the database spfile. Restart the database to enable the change.

Expected Results

All initialization parameters should meet minimum specifications. The initialization parameters are listed in Table 8–1. Check the release notes to see if any parameters have been added.

Corrective Actions

Set initialization parameters to meet minimum requirements as needed.

- Run `opatch -lsinventory` on the database to verify that patches have been applied according to the document for the specific platform.

  Validation Task 3: Verifying Database Patching

  Verify that all mandatory patches have been applied to the database.

  Prerequisites

  Make sure Validation Task 2: Verifying Database Parameter Configuration has been completed.

  How to Verify Database Patching

  Check the database patches that have been installed against the list of patches in Table 8-2 (page 8-8).

  – Compare the patch list against the output of opatch lsinventory.

    From the database `ORACLE_HOME`, run the command opatch lsinventory to get a list of patches that have been applied to the database. In the following example, `ORACLE_HOME` is set to the database home.

    ```
    $ORACLE_HOME/OPatch/opatch lsinventory
    ```

    The output from this command lists all patches applied to date.

    Expected Results

    All required patches must be installed, and all patch post-processing tasks must be completed, as described in each individual patch README document. The patch README text or HTML files are located in the top level patch directory after the patch zip file has been unzipped.

    Corrective Actions

    Apply any patches that may have been overlooked, and confirm that all post-processings tasks have been completed.

- Manual patch post-installation steps have been performed on all patches.
- The password policy has been defined and the passwords defined for the Oracle Fusion Applications database schemas are in line with the policy.
- The file system directories for the DBA directories have been created on the database server and are accessible (read-write) from all database nodes. Specifically, check the directory paths assigned to the directory names `APPLCP_FILE_DIR` and `APPLLOG_DIR` in the `ALL_DIRECTORIES` database table existing in the file system.

8.5 Oracle Fusion Applications RCU Installation Checklist

Before running the Oracle Fusion Applications RCU, verify the following checklist:

- Necessary infrastructure

  - Oracle Fusion Applications database is available and has passed post-install validation.
  - Access to the server console is provided for the OS user (VNC recommended).
- Prerequisites for the host running the Oracle Fusion Applications RCU.
- Planning
  - *Oracle Fusion Applications Installation Workbook*, **Databases** tab, **FA Transactional Database** table has been filled out with information that is used for the database installation.
  - Passwords have been chosen for the Oracle Fusion Applications schemas.

8.6 Run the Oracle Fusion Applications RCU to Create Oracle Fusion Applications Database Objects

The Oracle Fusion Applications Repository Creation Utility (Oracle Fusion Applications RCU) is a self-sufficient tool that runs from a graphical interface or from the command line. It creates applications-specific schemas and tablespaces for Oracle Database Enterprise Edition or Oracle Real Application Clusters.

The Oracle Fusion Applications RCU components are included in the zipped Oracle Fusion Applications RCU file delivered in the provisioning framework. The Oracle Fusion Applications RCU offers these features:

- Integrates Oracle Fusion Middleware and Oracle Fusion Applications schema and storage definitions using declarative XML.
- Runs locally or remotely as a standalone tool.
- Lets modify or use custom tablespaces for the default Oracle Fusion Applications schemas.
- Performs checks against both global and component-level prerequisites at runtime. If a prerequisite is not met, the Oracle Fusion Applications RCU may issue a warning and allow the procedure to continue (soft stop), or it may notify you that a prerequisite must be met (hard stop).
- Creates a resource plan, called `FUSIONAPPS_PLAN`, to manage Oracle Fusion Applications queries. See Configure the Database Resource Manager in the *Oracle Fusion Applications Administrator's Guide*.

8.6.1 Functional Design

The Oracle Fusion Applications RCU is designed to:

- Be completely self-contained. It has all the technical components necessary to perform the operations required (Oracle Client, binaries, scripts, data, and PL/SQL packages).
- Support Oracle Database 12.1.0.2.0 and database configurations such as ASM and Oracle RAC.
- Operate on remote databases.
- Connect to an existing database, read existing tablespace definitions, and create schema owners and new tablespaces.

Some limitations of the Oracle Fusion Applications RCU are as follows:

- The database it runs on must be empty. If applications-related schemas already exist, the option to modify them is grayed out.
- The Oracle Fusion Applications RCU does not provision delta schemas and does not perform database upgrades.
- The Oracle Fusion Applications RCU supports the import of full schemas only.
- The Oracle Fusion Applications RCU does not support the dropping of a component schema. However, drop the entire instance directly through the database, if required.

8.6.2 How Does the Oracle Fusion Applications RCU Work?

Use the Oracle Fusion Applications RCU to create a repository of applications-specific schemas and tablespaces for Oracle Database.

Internally, the Oracle Fusion Applications RCU performs actions related to Oracle Fusion Middleware components and Oracle Fusion Applications components. In addition, the utility takes appropriate action to see that the tables are enabled to store repository resources.

Oracle Fusion Middleware Components

The Oracle Fusion Applications RCU loops through all the middleware components in the component definition file and applies the relevant ones to the database. For each component, the Oracle Fusion Applications RCU creates the appropriate middleware tablespace and schema user. After creating the schema user, it defines the tables, views, and other artifacts that the schema owner owns.

Oracle Fusion Applications Components

The Oracle Fusion Applications RCU creates empty tablespaces for the Oracle Fusion Applications components. It then creates the schema owners (for example, FUSION and FUSION_RUNTIME). These schema owners are initially empty — they do not own any tables or data.

The Oracle Fusion Applications RCU employs Oracle Data Pump to import the seed data and the dump files containing tables, views, and other artifact definitions that belong to the schema users it has created. All dump files are packaged with the Oracle Fusion Applications RCU.

XML Schema Registration

When tables are created as part of an XML schema registration, by default the tables are enabled for hierarchy; that is, repository resources can be stored in the tables. Several triggers are created for this purpose. If resources are created, updated, or deleted based on the registered XML schema, the corresponding `XMLtype` rows in the tables are inserted, updated, or deleted.

Tables are disabled for the hierarchy before they are exported in dumpfile mode because some of the special features that make these tables store resources may not be meaningful in the target database. Disabling the hierarchy drops some triggers so that they do not show up in the target database after import of the dump files.

8.6.3 Run the Oracle Fusion Applications Repository Creation Utility Using the Wizard

Use the information in this section to prepare to run the Oracle Fusion Applications RCU and complete the wizard screens necessary to create schemas and tablespaces.

The Oracle Fusion Applications RCU is available only on Windows and Linux platforms. For other platforms, such as Solaris, install and run the Oracle Fusion Applications RCU from a Windows or Linux machine.

If there is a failure in the Oracle Fusion Applications RCU, see General Troubleshooting Tips (page 9-1) to confirm if it is possible to restart the Oracle Fusion Applications RCU. In some cases, it is necessary to start from the beginning by installing an empty database or using the Database Configuration Assistant and then running the Oracle Fusion Applications RCU.

8.6.3.1 Start the Oracle Fusion Applications RCU

After completing the steps in Getting Ready, run the Oracle Fusion Applications RCU from (UNIX) *APPS_RCU_HOME*`/bin` or (Windows) *APPS_RCU_HOME*`\bin` with the following command:

UNIX: `./rcu`

Windows: `rcu.bat`

The Oracle Fusion Applications RCU is available only on Linux and Windows platforms. On Windows systems, do not extract the rcuHome_fusionapps_win.zip file to a directory whose name contains spaces.

8.6.3.2 Wizard Screens and Instructions

Table 8-4 (page 8-27) lists the steps for running the Oracle Fusion Applications RCU. For help with any of the screens, click **Help**.

Table 8-4 Running the Oracle Fusion Applications Repository Creation Utility

Screen	Description and Action Required
Welcome	No action is necessary on this read-only screen. Click **Skip this Page Next Time** to avoid showing this screen the next time the Oracle Fusion Applications RCU is accessed. Click **Next** to continue.
Create Repository	Select **Create** to create and load component schemas into the database. See Schema and Password Requirements (page 4-25) for a list of schemas. Click **Next** to continue.
Database Connection Details	Specify the database connection details. See Specify Database Connection Details (page 8-31). Click **Next** to continue.

Table 8-4 (Cont.) Running the Oracle Fusion Applications Repository Creation Utility

Screen	Description and Action Required
Select Components	The Oracle Fusion Applications RCU retrieves the names of the Oracle Fusion Middleware and the Oracle Fusion Applications components. The schema owner names cannot be changed on this screen. By default, all components are checked so that they are included in the prerequisite check process. Click **Next** to begin the process. The Oracle Fusion Applications RCU verifies the global prerequisites. When the progress bar reports 100 percent complete and all prerequisites report a check mark, click **OK**. Click **Next** to continue. If the provisioning wizard is used to install the database using the dbca template, the default values for the `disk_asynch_io` and `filesystemio_options` parameters are as follows: `disk_asynch_io` is set to TRUE `filesystemio_options` is set to the default value based on the platform where the database is installed. It could be either *none*, *setall*, *asynch*, or *diskio*. To verify that the `filesystemio_options` parameter is using the default value, run the following query: `select isdefault from v$parameter where name='filesystemio_options` If it returns TRUE, the default value is set. If the parameter value is changed from the original default value to another value, and then changed back to the original default value, the default value still remains FALSE. The following warning messages are displayed based on the values set: If `disk_asynch_io` is set to FALSE and `filesystemio_options` is set to the default value, a warning message is displayed recommending setting the value for `disk_asynch_io` to TRUE. If `disk_asynch_io` is set to FALSE and `filesystemio_options` is not set to the default value, a warning message is displayed recommending setting the value for `disk_asynch_io` to TRUE for the best performance optimization.

Table 8-4 (Cont.) Running the Oracle Fusion Applications Repository Creation Utility

Screen	Description and Action Required
Schema Passwords	To specify the passwords for main and additional (auxiliary) schemas, select one of the following options: • **Use same passwords for all schemas**: Specify a single password for both schemas. Retype to **Confirm**. • **Use main schema passwords for auxiliary schemas**: Specify a different password to use for each main schema and for the associated auxiliary schema. Only the main schemas are visible. Retype the password to **Confirm**. • **Specify different passwords for all schemas**: Specify a unique password for each main schema and its auxiliary schema. All schemas are visible. Retype to **Confirm**. Passwords must have a minimum length of eight characters and contain alphabetic characters combined with numbers or special characters. Note the passwords that are entered. The passwords must be supplied when the response file is created. Click **Next** to continue.
Custom Variables	Each Oracle Database directory object has a value represented by a physical directory on the database server. Custom variables are pre-defined, platform-specific directory objects that the Oracle Fusion Applications RCU creates. In the **Value** column, enter a pre-existing physical directory (located on the database server) for each custom variable. See Manage Custom Variables (page 8-31) for a list of variables. Click **Next** to continue.
Map Tablespaces	To start the tablespace create process without making any changes, click **Next** on this screen. A message informs that any tablespaces that do not already exist are created. Click **OK** to continue. The **Creating Tablespaces** progress screen appears. Click **OK** when the operation is completed. However, before creating the tablespaces, the following operations can be performed: • Change Default and Temporary Tablespaces • View and Change Additional Tablespaces • Manage Tablespaces and Datafiles (add, modify, or remove) See Map Tablespaces (page 8-33). If changes are made, click **Next** when changes are completed, then click **OK** to create the tablespaces. Click **OK** when the operation is complete.
Summary	Review the information and click **Create**. If the information is correct, click **Create** to begin creating schemas. The Oracle Fusion Applications RCU displays the **Repository Creation Utility – Create** screen, showing the schema creation process. Typically, it takes 1 to 10 minutes to create each schema; however, the process may run for an additional half hour or more. A **Clock** indicates which schema creation is in progress. A **Check** indicates that the schema has been created successfully. To stop creating the schemas, click **Stop**.

Table 8-4 (Cont.) Running the Oracle Fusion Applications Repository Creation Utility

Screen	Description and Action Required
Completion Summary	The names of the log files for each component are listed in the Logfile column. If problems are encountered during the **Create** operation, check the log files for details. For more information about log files, see Troubleshoot Database Installations (page 9-1). If errors occur during the **Create** operation, or if a Create operation fails for any component, the **Cleanup for failed components** checkbox appears on this page and is selected by default. If the checkbox is selected, the Oracle Fusion Applications RCU automatically performs cleanup operations for the components that failed. Click **Close** to dismiss the screen and exit the Oracle Fusion Applications RCU.

8.6.3.2.1 Database Schema User Password Complexity Rules

For all Oracle Fusion Applications versions higher than Release 7 (11.1.7.0.0), Oracle Fusion Applications Life Cycle Management installs a custom PL/SQL password complexity checking function in the SYS schema. This password complexity checking function enforces a uniform set of minimum password complexity rules for all passwords in the database. This happens uniformly because the custom password complexity function is associated with the DEFAULT profile, which is used directly by most schemas in an FA database. The few schemas in an FA database that do not use the DEFAULT profile have their PASSWORD_VERIFY_FUNCTION profile attribute set to DEFAULT, which means the use of the rules defined in the DEFAULT profile.

The password complexity requirements for all schemas in an FA database are the following:

- Valid characters are: alphabetic (both upper and lower case), numeric, and special ($, #, or _). Special characters other than $, #, and _ are not allowed
- Minimum length is 8 characters.
- Maximum length is 30 characters.
- The password must start with an alphabetic character. Uppercase characters are allowed but not required
- The password must contain at least one alphabetic character and either one numeric or one special character.
- The password must differ from the previous password by at least three characters.
- Special-case checks:
  - The password cannot be the same as the schema name or the schema name with the numbers 1 through 100 appended.
  - The password cannot be the same as schema name reversed.
  - The password cannot be the same as the database name or the database name with the numbers 1 through 100 appended.

- The password cannot be 'oracle' or 'oracle' with the numbers 1 through 100 appended.
- The password cannot be one of the following elements: 'welcome1', 'database1', 'account1', 'user1234', 'password1', 'oracle123', 'computer1', 'abcdefg1', 'change_on_install'.

> **Note:**
>
> All of the special-case checks above are case-insensitive.

You are also allowed to install your own password complexity checking function.

8.6.3.3 Specify Database Connection Details

Specify the following connection credentials:

- **Database Type**: Select the database type.
- **Host Name**: Enter the name of the node on which the database resides, for example, `myhost.mydomain.com`. For Oracle RAC, specify the VIP name or one of the node names as the host name.
- **Port**: Specify the listener port number for the database. The default port number is 1521.
- **Service Name**: This is the global database name. To obtain the service name, see the `SERVICE_NAMES` parameter in the database initialization file. If the service name is not in the database initialization file, use the global name in `DB_NAME` and `DB_DOMAIN`. For Oracle RAC, specify the service name of one of the nodes, for example, `examplehost.exampledomain.com`.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table.

- **User Name**: Supply the name of the user with DBA or SYSDBA privileges. The default user name with SYSDBA privileges is `SYS`.
- **Password**: Enter the password for the database user.
- **Role**: Select Normal or SYSDBA. All schemas installed for Oracle Database require the `SYSDBA` role. For Oracle Internet Directory (OID) database schemas, use `SYS` and `SYSDBA`.

8.6.3.4 Manage Custom Variables

Enter a pre-existing physical directory on the database server where the custom variables for each component should be created.

- **FUSIONAPPS_DBINSTALL_DP_DIR**: The directory on the database server where the `export_fusionapps_dbinstall.zip` is unzipped and the `otbi.dmp` file is copied (see Make dmp Files Available on the Database Server (page 8-9)).

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **RCU OTBI_DBINSTALL_DUMP_DIR** row.

- **APPLCP_FILE_DIR**: Used by Oracle Enterprise Scheduler to store the log and output files. This directory must be valid on the database server with read-write permissions to the database owner. For Oracle RAC, must point to a location that is shared across all nodes.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **RCU APPLCP_FILE_DIR** row.

- **APPLLOG_DIR**: Location of the PL/SQL log files from Oracle Fusion Applications PL/SQL procedures on the database server. Ensure that the database owner has read-write privileges. For Oracle RAC, this value must point to the same location that exists in each node or a location shared across all nodes.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **RCU APPLLOG_DIR** row.

- **OBIEE Backup Directory**: Location of the Oracle Business Intelligence Enterprise Edition dump files. These files are used for enabling a restart action.

MANDATORY: Directories must be manually created on the database server and enter the full file path to the directories as the corresponding custom variable.

This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **RCU FUSIONAPPS_PROV_RECOVERY_DIR** row.

Secure Enterprise Search

- **Do you have Advanced Compression Option (ACO) License? Yes (Y) or No (N)**: Default is No.
- **Do you have Oracle Partitioning option License? Yes (Y) or No (N)**: Default is No.

Primary and Work Repository

Note: The default values are the **only** valid values. If any of these values is changed, the ODI-related provisioning process does not work.

- **Primary Repository ID**: Default = 501
- **Supervisor Password**: Enter and confirm the ODI supervisor password.

- **Work Repository Type**: (D) Development or (R). Default = D
- **Work Repository ID**: Default = 501
- **Work Repository Name**: Default = FUSIONAPPS_WREP
- **Work Repository Password**: Enter and confirm the Work Repository supervisor.

Oracle Transactional BI

- Directory on the database server where Oracle Transactional Business Intelligence import and export files are stored.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **FA Transactional Database** table, **RCU OTBI_DBINSTALL_DUMP_DIR** row

Activity Graph and Analytics

- **Install Analytics with Partitioning (Y/N)**: Default is N.

8.6.3.5 Map Tablespaces

Several operations can be performed from the **Map Tablespaces** screen including view, add, modify, or remove tablespaces. These actions are also available for additional tablespaces or datafiles.

8.6.3.5.1 Default Tablespace Mappings

In the Default Tablespace and Temp tablespace columns, click a cell to select from a list of available additional tablespace names. The default tablespaces are as follows:

- `BIACMTS`: For Oracle BI Applications Configuration Manager tables.
- `FUSION_DYN_TS`: For dynamically generated PL/SQL statements.
- `FUSION_GRC`: Associated with Fusion Risk and Controls tables and indexes.
- `FUSION_GRC_TEMP`: For Fusion Risk and Controls temporary tables.
- `FUSION_IAS_ORASDPM_AQ`: For advanced queuing JMS data and indexes.
- `FUSION_RDF`: Associated with Oracle Spatial and Graph tables and indexes.
- `FUSION_TEMP`: For temporary tables.
- `FUSION_TS_AQ`: For advanced queuing JMS data and indexes.
- `FUSION_TS_ARCHIVE`: For tables and objects that are no longer used.
- `FUSION_TS_DQ`: For data quality data and indexes.
- `FUSION_TS_INTERFACE`: For temporary or interface data and indexes.
- `FUSION_TS_MEDIA`: Contains multimedia objects such as text, video, and graphics.
- `FUSION_TS_NOLOGGING`: For materialized views and other temporary or scratch pad objects.

- FUSION_TS_QUEUES: For advanced queuing and dependent tables and indexes.
- FUSION_TS_SEED: For seed or reference data and indexes.
- FUSION_TS_SUMMARY: For summary management objects.
- FUSION_TS_TOOLS: Associated with Oracle Fusion Middleware data and indexes.
- FUSION_TS_TX_DATA: For transactional data.
- FUSION_TS_TX_IDX: Indexes for transactional data.
- IAS_IAU: For audit services data.
- IAS_TEMP: For audit services temporary data.
- SEARCH_DATA: For Secure Enterprise Search-related tables.
- SEARCH_INDEX: Indexes for Secure Enterprise Search-related tables.
- SEARCH_TEMP: For Secure Enterprise Search-related temporary tables.
- SYSAUX: Created automatically when the database is created to serve as an auxiliary tablespace to the SYSTEM tablespace.
- SYSTEM: Created automatically when the database is created to contain the data dictionary tables for the entire database.

For tablespaces that need to be created, the datafile defaults to `%DATAFILE_LOCATION%\%sid%\%tablespace_name%.dbf`. Selection from existing tablespaces is possible, if they are already defined in the database.

8.6.3.5.2 Set the Size of Tablespace Datafiles

The default out-of-the-box Oracle Fusion Applications tablespace sizes are optimal. To use different tablespace sizes, update the sizes of the tablespace (datafiles) on the **Manage Tablespaces** screen, accessed from the **Map Tablespaces** screen in the Oracle Fusion Applications RCU interface.

Due to a limitation in the framework used by Oracle Fusion Applications RCU, the size for the tablespaces FUSION_TS_TX_DATA and FUSION_TS_TX_IDX from Oracle Fusion Applications RCU cannot be updated because their respective datafile names exceed 29 characters. Thus, change manually the datafile size using SQL. For example, to resize the datafile to 2000 MB, use: `ALTER DATABASE DATAFILE '<full file path and file name of the datafile (file.dbf)>' RESIZE 2000M;`

Table 8-5 (page 8-34) lists the sizes of the optimal and out-of-the-box tablespaces. Make changes during the running of Oracle Fusion Applications RCU.

Table 8-5 Tablespace Optimal and OOTB Sizes

Tablespace Name	# of data files	Name of datafile	Size (MB) per datafile	Optimal/ out-of- the-box size (MB)
FUSION_DYN_TS	1	fusion_dyn_01.dbf	20	20
FUSION_IAS_ORASDPM_AQ	1	fusion_ias_sdpmqa_01.dbf	20	20
FUSION_TS_AQ	1	fusion_aq_01.dbf	200	200

Table 8-5 (Cont.) Tablespace Optimal and OOTB Sizes

Tablespace Name	# of data files	Name of datafile	Size (MB) per datafile	Optimal/ out-of- the-box size (MB)
FUSION_TS_ARCHIVE	1	fusion_archive_01.dbf	20	20
FUSION_TS_DQ	1	fusion_dq_01.dbf	20	20
FUSION_TS_INTERFACE	1	fusion_interface_01.dbf	750	750
FUSION_TS_MEDIA	1	fusion_media_01.dbf	20	20
FUSION_TS_NOLOGGING	1	fusion_nologging_01.dbf	20	20
FUSION_TS_QUEUES	1	fusion_queues_01.dbf	20	20
FUSION_TS_SEED	2	fusion_seed_01.dbf and fusion_seed_02.dbf	2048 and 1152	3200
FUSION_TS_SUMMARY	1	fusion_summary_01.dbf	20	20
FUSION_TS_TOOLS	4	fusion_tools_01.dbf - fusion_tools_04.dbf	2048, 2048, 2048, 1556	7700
FUSION_TS_TX_DATA	3	fusion_transaction_table_01.dbf - fusion_transaction_table_03.dbf	2048, 2048, 354	4450
FUSION_TS_TX_IDX	2	fusion_transaction_index_01.dbf and fusion_transaction_index_02.dbf	2048 and 1352	3400
FUSION_RDF	1	fusion_rdf.dbf	20	20
FUSION_GRC	1	fusion_grc.dbf	20	20
FUSION_GRC_TEMP	1	fusion_grc_temp.dbf	20	20

8.6.3.5.3 Change Default and Temporary Tablespace Names

To change the default tablespace name for a component, select the name in the Default Tablespace column. Then select the tablespace name from the list. Optionally, assign components to use any number of default tablespaces.

To change a temporary tablespace for a component, select a tablespace name in the Temp Tablespace column. Then, select the tablespace name from the list.

8.6.3.5.4 View and Change Additional Tablespaces

When components have additional tablespaces associated with their schemas, the **Additional Tablespaces** button is active. Click this button to view or modify additional tablespaces.

To change a tablespace, click in the Tablespace Name column and select the tablespace from the list.

Click **OK** to continue.

8.6.3.5.5 Manage Tablespaces and Datafiles

Click **Manage Tablespaces** to add, modify, or remove tablespaces. Only tablespaces that have not yet been created can be modified or removed. Existing tablespaces are visible, but grayed out and cannot be modified or removed.

Only tablespaces used by a component are created. A new tablespace can be specified, but unless it is used by a component, it is not created.

To edit a tablespace, select it from the navigation tree. Complete the following:

- **Name**: Specify a new name for the tablespace.
- **Type**: Indicate whether this tablespace is temporary or permanent.
- **Block Size**: The block size (in kilobytes) to be used for data retrieval.
- **Storage Type**: Select **Use Bigfile Tablespace** to use single large files. Select **Use Automatic Segment Space Management** to use bitmaps to manage free space within segments.

To **Add** a tablespace, specify the same details as for modifying one. Select a tablespace from the navigation tree and click **Remove** to prevent it from being created.

Manage Datafiles

Click the **Plus** (**+**) icon and complete the **Add Datafile** details:

- **File Name**: The name of the datafile.
- **File Directory**: The location where the datafile resides.
- **Size**: The initial size of the datafile.
- **Automatically extend datafile when full (AUTOEXTEND)**: Select this option to extend the datafile size automatically when it becomes full. In the **Increment** field, select the size by which the datafile should be increased.
- To limit maximum size, specify a value in the **Maximum Size** field.

Select a datafile and click the **pencil** icon. Modify the information on the **Edit Datafile** screen. Select a datafile and click the **X** icon to delete the file.

Edit the Size of a Datafile

To change the size of a tablespace:

1. Click a tablespace name to select it.
2. Click the **pencil** icon to bring up the **Edit Datafile** screen.
3. In the **Size** field, enter a new file size. For tablespaces with multiple data files, such as `FUSION_TS_TX_DATA`, delete the additional data files using the Remove Data File icon (**X**).
4. Click **OK** when all the tablespaces have been configured to return to the Map Tablespaces screen.

Click **OK** to dismiss the screen.

8.6.4 Oracle Fusion Applications RCU Post-Installation Checklist

After running the Oracle Fusion Applications RCU, complete the following tasks:

- Use SQL*Plus or another tool to verify that the Oracle Fusion Applications schemas have been created. Run this SQL statement to get the list of schema owners in the database instance. Ensure that the list contains all schema owners listed in Table 4-5 (page 4-26) except the DVOWNER and DVACCTMGR schemas:

  ```
  select username from dba_users where default_tablespace not in
  ('SYSTEM','SYSAUX');
  ```

- Use SQL* Plus or another tool to verify that the Oracle Fusion Applications DBA directories have been created. Run this SQL statement to get the list of defined directory names:

  ```
  select * from ALL_DIRECTORIES;
  ```

- Use SQL*Plus or another tool to verify the ability to connect as one of the Oracle Fusion Applications schema users.

8.7 Next Steps

When the database installation is completed and the schema and tablespace creation, follow the instructions in Troubleshoot Database Installations (page 9-1) to troubleshoot any issues.

9
Troubleshoot Database Installations

Follow the instructions described in this section if any issues are encountered during database installation for Oracle Identity Management or Oracle Fusion Applications. It also describes troubleshooting tips for the Oracle Fusion Middleware Repository Creation Utility (used for Oracle Identity Management) and Oracle Fusion Applications Repository Creation Utility operations.
This section contains the following topics:

- Troubleshoot the Oracle Identity Management Database Installation and Oracle Fusion Middleware RCU Operations (page 9-1)
- Troubleshoot Oracle Fusion Applications Database Installation and Oracle Fusion Applications RCU Operations (page 9-1)
- What to Do Next (page 9-7)

9.1 Troubleshoot the Oracle Identity Management Database Installation and Oracle Fusion Middleware RCU Operations

For more information about troubleshooting Oracle Database, see Troubleshooting in the *Oracle Database Installation Guide for Linux*.

For more information about troubleshooting the Oracle Fusion Middleware RCU, see Troubleshooting Repository Creation Utility in the *Oracle Fusion Middleware Repository Creation Utility User's Guide*.

9.2 Troubleshoot Oracle Fusion Applications Database Installation and Oracle Fusion Applications RCU Operations

This section contains troubleshooting tips for database installation and the Oracle Fusion Applications RCU operations. It is divided into sections for general tips and sections about log files and cleanup features.

9.2.1 General Troubleshooting Tips

If an error is displayed during the creation of applications schemas and tablespaces, take note of the following:

- Oracle Fusion Applications release notes may contain additional information about this release, such as mandatory Oracle Database server and client patches that must be applied to the environment.
- This release of Oracle Fusion Applications relies on specific system requirements that are explained in Certification in the *Oracle Fusion Applications Release Notes*.

- If abnormal program termination is encountered and the error log displays: `Java Exception: java.lang.StackOverflowError occurred` while installing Oracle database, then see document id 1056200.1 at My Oracle Support.
- Ensure that the database is up and running.
- If there is a failure in the Oracle Fusion Applications RCU during the creation of the tablespaces and loading of the Fusion schemas, start from the beginning by installing an empty database or using the Database Configuration Assistant. There is no drop option.
- Clean up these areas before redoing the installation. For information about the log files, see Oracle Fusion Applications RCU Log Files (page 9-2).
  - /tmp
  - old log file directories
  - /oraInventory folder contents
  - ORACLE_HOME (or remove the ORACLE_HOME to re-use the directory)
- If incorrect information is entered on one of the Oracle Fusion Applications RCU screens, use the navigation pane on the left side of the graphical interface to return to that screen.
- If an error occurred while the Oracle Fusion Applications RCU was running:
  1. Note the error and review the Oracle Fusion Applications RCU log files.
  2. Correct the issue that caused the error. Depending on the type of error, either continue with the operation or restart the Oracle Fusion Applications RCU.
  3. Continue or restart the Oracle Fusion Applications RCU to complete the desired operation.

9.2.2 Database Installation Log Files

The database installation log file reports what happened during each of the phases in a database installation. Click a log file symbol on the **Database Installation Progress** screen in the Provisioning Wizard to view the log file for that phase. Log files are located in *tmp_directory*/dbInstall_*time_stamp*_provtop/logs/provisioning/*host*. An example on a Linux platform is `/tmp/dbInstall_20120216092937_provtop/logs/provisioning/host123`. The `tmp` directory may differ depending on what is considered to be the temporary directory for various platforms. The location of the plan file for the database flow is to tmp_directory/dbInstall_time_stamp_provtop/dbInstall_time_stamp.plan.

9.2.3 Oracle Fusion Applications RCU Log Files

Log files describe what happened during the schema and tablespace creation process, including any failures that occurred. The main Oracle Fusion Applications RCU log file (rcu.log) is written to (Linux) *APP_RCU_HOME*/rcu/log/logdir.*date_timestamp* or (Windows) *APP_RCU_HOME*\rcu\log\logdir.*date_timestamp*. For example, the log file on a Linux operating system is:

APP_RCU_HOME/rcu/log/logdir.2010-01-02_03-00/rcu.log

The custom_comp_create_tbs.log file lists the PL/SQL statements that created the tablespaces.

In the `fusionapps` schema, three types of log files are created:

- **fusionapps.log**: Lists the PL/SQL that was run.
- **fusionapps_runimport.log**: The Oracle Data Pump import log file.
- **fusionapps_verify.log**: Lists verification errors if objects created are not what was expected.

In addition to the general log files, each component writes a log file of its own. The file name is in the form of *component_name*.log. For example, the log file for the `BIAPPS_OTBI_RUNIMPORT` component is biapps_otbi_runimport.log. All component log files are written to the same directory as the main log file.

The following list shows the log files in alphabetical order, by component name:

- biapps_otbi_runimport.log
- crm_fusion_mds_soa.log
- crm_fusion_soainfra.log
- fin_fusion_mds_soa.log
- fin_fusion_soainfra.log
- fmw_runtime.log
- fusion_activities.log
- fusionapps.log
- fusion_bia_cloud.log
- fusion_biplatform.log
- fusion_discussions.log
- fusion_edqconfig1.log
- fusion_edqconfig2.log
- fusion_edqfusion.log
- fusion_edqresults1.log
- fusion_edqresults2.log
- fusion_ero.log
- fusion_grc.log
- fusion_iau.log
- fusion_intg_current.log
- fusion_intg_final.log
- fusion_intg_previous.log
- fusion_ipm.log
- fusion_mds_ess.log
- fusion_mds.log
- fusion_mds_spaces.log
- fusion_ocserver11g.log
- fusion_odi.log

- fusion_opss.log
- fusion_ora_ess.log
- fusion_orasdpls.log
- fusion_orasdpm.log
- fusion_orasdpsds.log
- fusion_orasdpxdms.log
- fusion_otbi.log
- fusion_portlet.log
- fusion_rdf.log
- fusion_ro.log
- fusion_social_cef.log
- fusion_social.log
- fusion_social_views.log
- fusion_webcenter.log
- hcm_fusion_mds_soa.log
- hcm_fusion_soainfra.log
- hed_fusion_mds_soa.log
- hed_fusion_soainfra.log
- lcm_exp_admin.log
- lcm_object_admin.log
- lcm_super_admin.log
- lcm_user_admin.log
- odi-seed.log
- oic_fusion_mds_soa.log
- oic_fusion_soainfra.log
- prc_fusion_mds_soa.log
- prc_fusion_soainfra.log
- prj_fusion_mds_soa.log
- prj_fusion_soainfra.log
- scm_fusion_mds_soa.log
- scm_fusion_soainfra.log
- searchsys.log
- setup_fusion_mds_soa.log
- setup_fusion_soainfra.log
- dvacctmgr.log
- dvowner.log

9.2.4 Oracle Fusion Applications RCU Taking a Long Time

When installing all components, including the FUSIONAPPS component, Oracle Fusion Applications RCU should complete in four hours or less. If it is running more than four hours, you can safely cancel the run and perform the post-cancellation steps described below.

Post-Cancellation Steps

Follow the steps and ensure each step is completed successfully. If any prerequisite is not satisfied, do not proceed to the next step.

1. Verify that the Oracle Fusion Applications Apps RCU has completed importing the data from the dump files. If you do not see the expected line in the log, do not proceed and wait for this import to complete.

   ```
   cd $RCU/rcu/log/logdir.YYYY-MM-DD.HH-MM
   tail fusionapps_runimport.log
   verify that the last line in the log has this:
   > Job "SYS"."FUSIONDBJOB" completed with XX error(s) at
   <day> HH:MM:SS YYYY elapsed 0 HH:MM:SS
   ```

2. Verify that Oracle Fusion Applications Apps RCU has completed the import integrity check. If the integrity check log does not exist, do not proceed and wait for the verification process to be completed. If there are errors, Oracle Fusion Applications RCU will display the error in the UI.

   ```
   cd $RCU/rcu/log/logdir.YYYY-MM-DD.HH-MM
   ls fusionapps_verify.log
   > fusionapps_verify.log
   ```

3. Stop the Oracle Fusion Applications Apps RCU. When you stop this run, the SQL process that performs histogram optimization will be running in the background. Proceed to the next step.

   ```
   Click on "Stop" button
   Click on "Yes" button when you get "Repository Creation Utility -
   Warning"
   dialog with the message "Do you want to stop the current operation?"
   It may take a while for the stop operation to complete
   Uncheck the box for "Cleanup for failed components"
   Click on "Close" button
   ```

4. Perform these steps manually on the machine where the database is running. Ensure that `$ORACLE_HOME` and `$ORACLE_SID` are set correctly to connect to the database.

   a. Recompile database packages.

      ```
      cd $RCU/integration/fusionapps/sql
      $ORACLE_HOME/bin/sqlplus "/as sysdba"
      > @fusionapps_recompile_packages
      > exit
      ```

b. Update FND tablespaces.

```
cd $RCU/fusionapps/sql
$ORACLE_HOME/bin/sqlplus "/as sysdba"
> @fusionapps_update_fnd_tablespaces  FUSION_TS_TX_DATA
FUSION_TS_TX_DATA
FUSION_DYN_TS  FUSION_DYN_TS  FUSION_IAS_ORASDPM_AQ
FUSION_IAS_ORASDPM_AQ
FUSION_TS_AQ FUSION_TS_AQ FUSION_IAS_ORASDPM_AQ
FUSION_IAS_ORASDPM_AQ FUSION_TS_ARCHIVE FUSION_TS_ARCHIVE
FUSION_TS_DQ FUSION_TS_DQ FUSION_TS_INTERFACE
FUSION_TS_INTERFACE
FUSION_TS_MEDIA FUSION_TS_MEDIA FUSION_TS_NOLOGGING
FUSION_TS_NOLOGGING
FUSION_TS_QUEUES FUSION_TS_QUEUES FUSION_TS_SEED FUSION_TS_SEED
FUSION_TS_SUMMARY FUSION_TS_SUMMARY FUSION_TS_TOOLS
FUSION_TS_TOOLS
FUSION_TS_TX_IDX  FUSION_TS_TX_IDX
> exit
```

Verify the command completes with a "PL/SQL procedure successfully completed." message. If you get a different message indicating any error, review it and contact Oracle support to resolve the issue.

c. Register Oracle Fusion Applications RCU components in the database.

```
$ORACLE_HOME/bin/sqlplus "/as sysdba"
> update schema_version_registry set status="VALID" where
comp_id in
> ('FUSIONAPPS', 'FUNCTIONAL_SETUP_MANAGER', 'TOPOLOGY_MANAGER');
```

Verify the command completes with a "3 rows updated" message. If you get a different message, contact the Oracle support.

d. Verify that Fusion Oracle Applications RCU components are registered properly.

```
$ORACLE_HOME/bin/sqlplus "/as sysdba"
select comp_id, status from schema_version_registry where
comp_id in
('FUSIONAPPS', 'FUNCTIONAL_SETUP_MANAGER', 'TOPOLOGY_MANAGER');
```

Verify the output is:

```
COMP_ID                        STATUS
------------------------------ -----------
FUNCTIONAL_SETUP_MANAGER       VALID
FUSIONAPPS                     VALID
TOPOLOGY_MANAGER               VALID
```

9.2.5 Preverification Failure (UNIX)

The following errors might be ecountered while running the preverification phase on Unix systems:

```
PRODUCTFAMILY=dbserver!PRODUCT=RDBMS_11gR2!TASK=Checking pre-req files
and directories!TASKID=dbserver.RDBMS_11gR2.NONE.preverify.NONE!MESSAGE=!
DETAIL=After validating the patch directory, $REPOSITORY/installers/
database/patch', it has been determined that no patches will be applied
during this install|Opatch Directory Validation Requires:| (1)$REPOSITORY/
installers/database/patch must be a valid DIRECTORY|(2) $REPOSITORY/
installers/database/patch must contain NO FILES, only subdirectories|(3)
Patches must be unzipped in $REPOSITORY/installers/database/patch
```

Solution: Ignore the error and proceed with the database installation.

9.2.6 Preverification Failure (Solaris)

During provisioning, the preverify phase (target) may display a message that some of the Solaris operating system (version 9 and 10) patches are missing. On Solaris x86-64, the following preverify failures may be reported:

```
WARNING: Check:Patches failed.
Checking for 127111-02; Not found.  Failed <<<<
Checking for 137111-04; Not found.  Failed <<<<
```

These failure messages can be ignored.

9.2.7 Using the Cleanup Feature

If there is a failure in creation of the tablespaces or schemas for any component, the **Cleanup for failed components** checkbox appears on the **Completion Summary** screen. Select this option to clean up tablespaces and schemas for the failed components.

If an environment (such as the database server) is running out of space, correct it and rerun the software. Any components that are not applied successfully are still enabled (not grayed out) in the interface. Rerun the Oracle Fusion Applications RCU as described in Run the Oracle Fusion Applications RCU to Create Oracle Fusion Applications Database Objects (page 8-25).

9.3 What to Do Next

Follow the instructions in Oracle Identity Management Provisioning (page 10-1) to create a response file and provision an Oracle Identity Management environment.

10
Oracle Identity Management Provisioning

This section describes the tasks that must be completed to implement Oracle Identity Management Provisioning for both the Single Host and Enterprise (EDG) topologies. The Single Host topology is recommended only for test environments, whereas the Enterprise topology, which is more complex, is suitable for staging, QA, and production deployments.

This section contains the following topics:

- Introduction to Oracle Identity Management Provisioning (page 10-1)
- Create an Oracle Identity Management Provisioning Profile (page 10-2)
- Provision an Oracle Identity Management Environment (page 10-13)
- Perform Oracle Identity Management Provisioning (page 10-16)
- Perform Provisioning by Running the Provisioning Commands (page 10-16)
- Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17)
- Perform Mandatory Oracle Identity Management Post-Installation Tasks (page 10-23)
- Validate Provisioning (page 10-24)
- Manage the Topology for an Oracle Identity Management Enterprise Deployment (page 10-26)
- What to Do Next (page 10-30)

10.1 Introduction to Oracle Identity Management Provisioning

The Oracle Identity Management Provisioning Wizard and related tools were developed to automate Oracle Identity Management Provisioning and reduce the time required to configure Oracle Identity Management for Oracle Fusion Applications.

MANDATORY: All server machines in an Oracle Identity Management Provisioning environment must be running the same operating system major version and patch level. Heterogeneous operating system deployments are not supported.

Before provisioning Oracle Identity Management, ensure that the following tasks have been completed:

1. Follow the instructions in Install the Oracle Identity Management and Oracle Fusion Applications Provisioning Frameworks (page 6-1), and successfully install the Oracle Identity Management Provisioning framework.
2. Create an Oracle Identity Management provisioning profile as described in Create an Oracle Identity Management Provisioning Profile (page 10-2).

The Oracle Identity Management Provisioning process itself consists of two tasks:

1. Running the Oracle Identity Management Provisioning Wizard, a graphical user interface that uses an interview process to gather information about the environment and store it in a Provisioning Response file. This task is described in Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17).
2. Executing command-line tools to set up the environment on the selected host machines. In many cases, the progress of the command-line tools can be monitored by using the wizard. This task is described in Perform Provisioning by Running the Provisioning Commands (page 10-16).

After provisioning, perform the tasks in Perform Mandatory Oracle Identity Management Post-Installation Tasks (page 10-23).

10.2 Create an Oracle Identity Management Provisioning Profile

Before performing provisioning, provide information about the topology to the Oracle Identity Management Provisioning Wizard. Once all the necessary input has been provided, the wizard creates a provisioning file called `provisioning.rsp` that is used to perform the provisioning operation.

Even if a single node install is selected, the screens in the Oracle Identity Management Provisioning Wizard show multinode items such as Virtual Host Configuration and Load Balancer Configuration. Ignore the unused fields.

Before running the provisioning tool, set the following environment variables:

- Set `JAVA_HOME` to: *`REPOSITORY_LOCATION`*`/jdk`
- On UNIX systems, set the `DISPLAY` environment variable to an active and authorized display.

To start the Oracle Identity Management Provisioning Wizard, execute the following commands from: `IDMLCM_HOME/provisioning/bin`, where *`IDMLCM_HOME`* is the place where the Oracle Home Directory for Oracle Identity Management was installed, using the installation script for the Oracle Identity Management Provisioning Wizard and Oracle Identity Management Patching Tools, as described in Install the Oracle Identity Management Lifecycle Tools (page 6-2).

Linux or UNIX:

```
./idmProvisioningWizard.sh
```

```
idmProvisioningWizard.bat
```

When the wizard starts, proceed as described in the following sections:

- Welcome Page (page 10-3)
- Specify Inventory Directory Page (page 10-3)
- Identity Management Installation Options Page (page 10-3)
- Specify Security Updates Page (page 10-3)
- Product List Page (page 10-3)
- Response File Description Page (page 10-4)

- Install Location Configuration Page (page 10-4)
- Node Topology Configuration Page (page 10-5)
- Virtual Hosts Configuration Page (page 10-6)
- Common Passwords Page (page 10-7)
- OID Configuration Page (page 10-7)
- ODSM Configuration Page (page 10-8)
- OHS Configuration Page (page 10-8)
- OAM Configuration Page (page 10-9)
- IDM DB Configuration Page (page 10-10)
- Load Balancer Page (page 10-11)
- Summary Page (page 10-13)

10.2.1 Welcome Page

Use the Welcome page to learn more about the wizard, including some prerequisites for using it.

The Welcome page provides a brief overview of the wizard and lists some requirements that must be met.

Click **Next** to continue.

10.2.2 Specify Inventory Directory Page

If the Specify Inventory Directory page is presented, proceed as described in Step 2 in Install the Oracle Identity Management Lifecycle Tools (page 6-2).

Click **OK** to continue.

10.2.3 Identity Management Installation Options Page

Select **Create a New Identity Management Environment Provisioning Response File** to create a response file for the first time.

Update an Existing Identity Management Environment Provisioning Response File is not supported.

Click **Next** to continue.

10.2.4 Specify Security Updates Page

The checkbox should be unchecked, as this feature is not supported.

Click **Next** to continue.

10.2.5 Product List Page

The Product List page is purely informational. It displays the list of products that are installed and configured by the Oracle Identity Management Provisioning Wizard.

Click **Next** to continue.

10.2.6 Response File Description Page

Specify descriptive information to identify this response file. This description is not associated in any way with the executable plan file, or the summary file, saved at the end of the response file creation process.

- **Response File Name**: The Oracle Identity Management Provisioning Wizard provides the default title Oracle Identity Management Provisioning Response File. This file can be changed.
- **Response File Version**: The Oracle Identity Management Provisioning Wizard provides a default value, which can be change. Use this to keep track of different file versions.
- **Created By**: Defaults to the operating system user who invoked the Provisioning Wizard. Set when the response file is initially created and cannot be modified for the current response file.
- **Created Date**: Defaults to the date that the response file was initially created. Set when the response file was initially created and cannot be modified for the current response file.
- **Response File Description**: Provide a description of this response file. This is an optional field.

Click **Next** to continue.

10.2.7 Install Location Configuration Page

Use the Install Location Configuration page to supply the location of the various directories required for installation and configuration actions.

Installation and Configuration

- **Software Repository Location**: Specify the location of the software repository, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it. This location must contain a folder named *`installers`*, which contains the software to install.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Temporary Shared Storage** table, **Provisioning Repository Location** row.

- **Software Installation Location**: Specify the location on shared storage for the Middleware Homes, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it. In a multinode scenario, this folder must be shared across all machines.

  Ensure that this directory path is 45 characters or fewer in length. A longer path name can cause errors during Oracle Identity Management provisioning.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **IDM Software Installation Location** row.

- **Shared Configuration Location**: Specify the shared configuration location, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it.

  In a single host environment, the shared configuration location is not actually shared.

  For the Enterprise topology, this is where the artifacts to be shared across all hosts, such as keystores, scripts to start/stop services, and life cycle management information, are created. In a multi-node scenario, this folder must be shared across all machines.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **IDM Shared Configuration Location** row.

- **Enable Local Configuration Location**: Select this option **only** when provisioning the Enterprise topology.

  Depending on the decision made during the planning phase this option is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **IDM Local Configuration Location** row. If the value is not specified in the *Oracle Fusion Applications Installation Workbook*, clear this checkbox.

  – **Local Configuration Location**: Specify the location for the local domain directory to be set up, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it. This field is required if the option **Enable Local Applications Configuration** is selected. The specified directory must initially be empty. This folder should not be shared across hosts.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **IDM Local Configuration Location** row.

Click **Next** to continue.

10.2.8 Node Topology Configuration Page

Use the Node Topology Configuration page to select configuration options and provide information about hosts and products.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Environment Info** table, **IDM Topology Type** row.

- **Single Host**: Select to provision a simple, single host topology. This topology is recommended **only** for test and development environments.
  - **Host Name**: Specify the host where Oracle Identity Management is provisioned, as a fully-qualified host name.
- **EDG Topology: One Node**: Select to install Oracle Identity Management on a single host.
  - **Product(s)**: This field cannot be edited. It specifies the product that be installed and configured on the host.
  - **Host Name**: Specify each host where the corresponding product is provisioned, as a fully-qualified host name.
- **EDG Topology: Two Node**: Select to provision a multiple host topology. This option configures two instances of the product. Selecting this option provisions a highly-available environment.
  - **Product(s) - First and Second Instance**: This field cannot be edited and specifies the instance of the product that is installed and configured on the host.
  - **Host Name**: Specify the host where the first and second instance of these applications are provisioned, as a fully-qualified host name. To install Oracle Identity Management on a single host, specify the same host name for all instances.

    > **Tip:**
    >
    > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab:
    >
    > * **Abstract Hostname** (or real Hostname if no Abstract) from Topology table row that matches the following components:
    >   * IDM Directory
    >   * IDM Identity and Access
    >   * IDM WebTier

Click **Next** to continue.

10.2.9 Virtual Hosts Configuration Page

Use the Virtual Hosts Configuration page to select virtual host configuration options. If **Single Host** is selected, the Virtual Hosts Configuration page cannot be edited.

Associate the Administration Server, Oracle Identity Manager and Oracle SOA Suite servers with virtual IP addresses. If **Configure second application instances** is selected on the Node Topology Configuration page, having a virtual IP address allows the Administration Server to be started on a different host if the primary host fails. Virtual IP addresses and virtual host names are required to enable server migration on Oracle Identity Manager andOracle SOA Suite servers. Server migration must be configured for the Oracle Identity Manager and Oracle SOA Suite managed servers for high availability.

Specify the configuration settings for the virtual hosts required by Oracle Fusion Applications.

- **Configure Virtual Hosts?**: Select to configure virtual hosts.
- **Server**: Identifies each server.
- **Virtual Host Name**: Specify the virtual host name for the server.

> **Tip:**
>
> The value for the Admin Server is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **AdminServer Virtual Hosts/VIPs** table, **IDMDomain AdminServer** row.
>
> For the Enterprise topology, specify the virtual host name from the *Oracle Fusion Applications Installation Workbook* for each managed server in the topology. For example:
>
> Admin Server: `ADMINVHN.mycompany.com`

Click **Next** to continue.

10.2.10 Common Passwords Page

Use the Common Passwords page to select a common password.

- **Common Identity Management Password**: Specify a password to be used for all administrative users in the Oracle Identity Management Suite and for keystores. The password must be at least eight characters long and must contain at least one uppercase letter and at least one number.
- **Confirm Common Identity Management Password**: Reenter the password.

Click **Next** to continue.

10.2.11 OID Configuration Page

Use the OID Configuration page to select configuration options for Oracle Internet Directory.

Oracle Internet Directory Configuration Parameters

Identity Store Realm DN: Specify the Distinguished Name of the Oracle Internet Directory realm, for example: `dc=mycompany,dc=com`.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab , **LDAP** table, **Identity Store Realm DN** row.

Authentication Directory Type

Select one of the following authentication directories:

- **Oracle Internet Directory**
- **Oracle Virtual Directory**

Click **Next** to continue.

10.2.12 ODSM Configuration Page

Use the ODSM Configuration page to select configuration options for Oracle Directory Services Manager (ODSM). Information about the second host appears on the page for EDG topology or if Configure Second Instances Topology was selected in the Node Topology Configuration Page (page 10-5).

- **ODSM Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **Port**: Specify the port to be used by the first ODSM instance.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain ODSM** row.

- **Second ODSM Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **Second ODSM Port**: Specify the port to be used by the second ODSM instance.

Click **Next** to continue.

10.2.13 OHS Configuration Page

Use the OHS Configuration page to change the installation ports used for Oracle HTTP Server (OHS). Information about the second host appears on the page only if Configure Second Instances Topology was selected in the Node Topology Configuration Page (page 10-5).

Oracle HTTP Server for Identity Management Configuration Parameters

- **Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **Port**: Specify the non-SSL port number to be used for the first instance of the Oracle HTTP Server.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDM Oracle HTTP Server** row.

- **SSL Port**: Specify the SSL port number to be used for the first instance of the Oracle HTTP Server.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDM Oracle HTTP Server SSL** row.

- **Instance Name**: This field is purely informational. It displays the instance name of the first Oracle HTTP Server.
- **Second OHS Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **Second OHS Port**: Specify the non-SSL port number to be used for the second instance of the Oracle HTTP Server.
- **Second OHS SSL Port**: Specify the SSL port number to be used for the second instance of the Oracle HTTP Server.
- **Second Instance Name**: This field is purely informational. It displays the instance name of the second Oracle HTTP Server.
- **Protocol**: This field is purely informational.

Click **Next** to continue.

10.2.14 OAM Configuration Page

Use the OAM Configuration page to select installation options for Oracle Access Manager. Information about the second host appears on the page only if Configure Second Instances Topology was selected in the Node Topology Configuration Page (page 10-5).

Oracle Access Manager Configuration Parameters

- **OAM Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **OAM Port**: Specify the port number of the first instance.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain OAM** row.

- **Second OAM Host**: This field is purely informational. The value is determined by the host entered in the Node Topology Configuration Page (page 10-5).
- **Second OAM Port**: Specify the port number of the second instance.
- **OAM Transfer Mode**: Specify the transfer mode to be used by Oracle Access manager. This must be `Simple` on all platforms.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **OAM** table, **OAM Transfer Mode** row.

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- **Cookie Domain**: Specify the cookie domain. For example: `.mycompany.com`

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Environment Info** table, **Domain name** row.

Click **Next** to continue.

10.2.15 IDM DB Configuration Page

The same database instance is used but pass the two distinct service names created: one service name for OID and another for OAM.

Use the IDM DB Configuration page to enter information about the database that contains the schemas for Oracle Internet Directory and Oracle Access Manager.

OID Schema Details

- **Service Name**: Specify the service name of the database service, for example: oiddb.mycompany.com
- **Schema User Name**: This field specifies the name of the schema user, `ODS`. This name cannot be changed.
- **Schema Password**: For creating the ODS schema, specify the password used when creating the Oracle Internet Directory schema using the Oracle Fusion Middleware RCU.

OAM Schema Details

- **Service Name**: Specify the service name of the database service, for example: `oamdb.mycompany.com` .
- **Schema User Name**: This field specifies the name of the schema user, `FA_OAM`. This name cannot be changed.

- **Schema Password**: For creating the FA_OAM schema, specify the password used when creating the Oracle Internet Directory schema using the Oracle Fusion Middleware RCU.

Single DB: Select if a single Oracle Database is used.

- **Host VIP Name**: Specify the host name of the Oracle Database.
- **Listener Port**: Specify the database listener port.

RAC DB: Select if an Oracle RAC Database is used.

- **Host VIP Name**: Specify the host name of the RAC database instance.
- **Listener Port**: Specify the database listener port.
- **Instance Name**: Specify the database instance name, for example, idmdb1.

Click **Next** to continue.

10.2.16 Load Balancer Page

The Load Balancer page is editable only if the **EDG topology** option has been selected.

The Load Balancer page is arranged in the following sections:

- HTTP/HTTPS Load Balancer Details
- LDAP Load Balancer Details

HTTP/HTTPS Load Balancer Details

The HTTP/HTTPS Load Balancer Details section of the Load Balancer Configuration page enables to enter configuration information about the HTTP/HTTPS Load Balancer.

- **Configure LBR Endpoints**: Select this option to configure the Admin, Internal Callbacks, and SSO LBR endpoints for a single-node topology.

  In a three-node topology, the **Configure LBR Endpoints** option is selected by default. In a six-node enterprise deployment topology, the option is selected by default and cannot be deselected.

- **Endpoint**: This column lists the HTTP/HTTPS Load Balancer endpoints. These are:
  - **Admin**: Admin Virtual Host, for example: `admin.mycompany.com`

    > **Tip:**
    >
    > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **IDM Admin** row, **Internal Name** and **Internal Port** columns.

  - **Internal Callbacks**: Internal call back virtual host, for example: `Identity Managementinternal.mycompany.com`

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **IDM** row, **Internal Name** and **Internal Port** columns.

  - **SSO**: Main application entry point, for example: `sso.mycompany.com`.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **IDM** row, **External Name** and **External Port** columns.

- **Virtual Host Name**: Specify the virtual host name that corresponds with this endpoint. Examples are shown in the **Endpoint** descriptions.
- **Port**: Specify the port used by the endpoint. This port is either HTTP or HTTPS, depending on whether the SSL box is checked or not.

  If the **Configure LBR Endpoints** option has not been selected, the virtual host name and port for the three endpoints are automatically populated with the Oracle HTTP Server host name and port 7777.
- **SSL**: Select this box if this endpoint uses SSL. This box is editable only for **Admin** endpoint.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **SSL and Certificates** tab, **SSL Communication** table, **End User - -> IDM Admin HTTP Endpoint** row.

LDAP Load Balancer Details

The LDAP Load Balancer Details section of the Load Balancer Configuration page enables to enter configuration information about the LDAP Load Balancer.

The **OID Endpoint for Identity Store** field is not editable because the Identity Store and Policy Store is the same Oracle Internet Directory. See Identity Store Planning (page 4-30).

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **LDAP Endpoints** table.

- **Endpoint**: This column lists the LDAP Load Balancer endpoints.

- **Virtual Host Name**: Specify the virtual host name that corresponds with this endpoint.
- **Port**: Specify the port used by the endpoint.
- **SSL Port**: Specify the SSL port used by the endpoint.

Click **Next** to continue.

10.2.17 Summary Page

Use the Summary page to view a summary of the selections and enter additional information.

- **Response File Name**: Provide the name of the response file to be created.
- **Provisioning Summary**: Provide the name of the provisioning summary file to be created.
- **Directory**: Specify the directory to save the Provisioning Response File in.

10.2.18 Copy Required Files to DMZ Hosts

The process described in this section creates a provisioning file in the directory specified on the Summary screen in the Summary Page (page 10-13). This process also creates a folder named `responsefilename_data`, for example: `provisioning_data`. This folder contains `cwallet.sso`, which has encryption and decryption information.

The provisioning response file and the folder containing `cwallet.sso` must be available to each host in the topology. If a shared provisioning directory exists, then these files are automatically available. If, however, the deployment directory has not been shared, perform a manual copy of the deployment response file (`provisioning.rsp`) and the folder containing `cwallet.sso` (`provisioning_data`) to the same location on the DMZ hosts, WEBHOST1 and WEBHOST2.

WARNING: If the deployment response file and the folder containing `cwallet.sso` are not copied to the DMZ hosts, the deployment process might fail in the preverify phase.

10.3 Provision an Oracle Identity Management Environment

After creating the provisioning response file, use it to provision an Oracle Identity Management environment.

There are eight stages to provisioning. These stages must be run in the following order:

1. Preverify - This checks that each of the servers being used in the topology satisfies the minimum requirements of the software being installed and configured.
2. Install - This installs all of the software and related patches present in Provisioning Repository.
3. Preconfigure - This does the following:
   - Creates OID and seeds it with Users/Groups.
   - Configures ODSM
   - Creates the WebLogic Domain

- Creates OHS instance

4. Configure - This does the following:
   - Starts managed servers as necessary
   - Associates OAM with OID
5. Configure-Secondary - This does the following:
   - Integrates Weblogic Domain with Web Tier
   - Register Web Tier with domain
6. Postconfigure - This does the following:
   - Register OID with Weblogic Domain
   - SSL Enable OID
   - Tune OID
   - Generate OAM Keystore
   - Configure OIF
   - Configure WebGate
7. Startup - This starts up all components in the topology
8. Validate - This performs a number of checks on the built topology to ensure that everything is working as it should be.

Specify the stage using the `-target` option to the `runIDMProvisioning.sh` or `runIDMProvisioning.bat` command. Each stage must be completed before the next stage can begin. Failure of a stage necessitates a cleanup and restart.

It is important to take a backup of the filesystems and databases at the following points:

1. Prior to starting provisioning.
2. At the end of the installation phase.
3. Upon completion of provisioning

It is not possible to restore a backup at any phase other than those three.

Provisioning is accomplished by using either the command line or the Oracle Identity Management Provisioning Wizard.

10.3.1 Processing Order

Process hosts in the following order. Each provisioning phase needs to be run only once on each host, even if multiple products are configured on a single host.

1. LDAP Host 1
2. LDAP Host 2 (if using the EDG topology with the **Configure second application instances** option)
3. Identity and Access Management Host 1
4. Identity and Access Management Host 2 (if using the EDG topology with the **Configure second application instances** option)
5. Web Host 1

6. Web Host 2 (if using the EDG topology with the **Configure second application instances** option)

10.3.2 Installation Phase Actions for Oracle Identity Management Components

During installation, the Provisioning Wizard performs actions that are associated with the Oracle Identity Management components previously installed. This section contains a summary of those actions, arranged by the installation phase where the action is performed.

Provisioning phases

The wizard performs the following actions:

- Preverify phase

  Verifies the existence of the system administrators group (if it was declared as existing during the wizard interview) and the existence of the designated super user in the identity store.

- Preconfigure phase

  Prepares the Oracle Identity Management components for configuring as follows:

  - Uploads the LDIF files to the identity store. These files contain entries that represent the application administrator groups used to update the identity store.
  - Creates the system administrator group (according to what is indicated in the interview).
  - Makes the super user a member of the administrators group and all the application family directory groups.
  - Seeds the bootstrap of `AppID` and gives it membership in the system administrator group.

- Configure phase

  Configures the Oracle Identity Management components as follows:

  - Creates the Oracle Fusion Applications domains using the default Oracle WebLogic Server template, with the bootstrap `AppID` as an administrator.
  - Disables the default authenticator and enables the LDAP authenticator.
  - Starts the Oracle WebLogic Server domain using the bootstrap `AppID`.

- Postconfigure phase

  Following configuration, the system administrator groups are assigned the appropriate enterprise roles at the product family level. Therefore, the super user has:

  - Administrator privileges for all Oracle WebLogic Server domains and all middleware
  - Functional setup privileges for all Oracle Fusion Applications offerings
  - Administration privileges to Oracle Fusion Applications offerings, excluding transactional privileges

10.4 Perform Oracle Identity Management Provisioning

Provisioning is accomplished by using either the command line or the Oracle Identity Management Provisioning Wizard.

This section contains the following topics:

- Perform Provisioning by Running the Provisioning Commands (page 10-16)
- Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17)

10.4.1 Perform Provisioning by Running the Provisioning Commands

To use the command line, run the command `runIDMProvisioning.sh` or `runIDMProvisioning.bat` a number of times, specifying the provisioning stage with the `-target` option.

MANDATORY: complete each command, in order, before running the next command.

Before running the provisioning tool, set the following environment variables:

- Set `JAVA_HOME` to: *`REPOSITORY_LOCATION`*`/jdk`
- Check whether the *`TNS_ADMIN`* environment variable is set on the Oracle Internet Directory hosts.

  ```
  env | grep TNS_ADMIN
  ```

  If it is set, unset it.

  Bash

  ```
  unset TNS_ADMIN
  ```

  Csh

  ```
  unsetenv TNS_ADMIN
  ```

- On Linux systems, set the DISPLAY environment variable to an active and authorized display.

  On Solaris platforms, unset the DISPLAY environment variable on the system. This is required for all targets of the Oracle Identity Management provisioning.

The command syntax for the provisioning tool on UNIX is:

```
runIDMProvisioning.sh -responseFile RESPONSE_FILE -target STAGE
```

Where:

`RESPONSE_FILE` is the provisioning response file. The file name and directory are specified on the Summary page when the wizard is run to create the file. See Summary Page (page 10-13). The default value is *`IDMLCM_HOME`*`/provisioning/bin/provisioning.rsp` on UNIX.

`STAGE` is one of the stages listed in Provision an Oracle Identity Management Environment (page 10-13).

10.4.2 Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard

To use the Oracle Identity Management Provisioning Wizard to monitor the progress of provisioning, follow these steps:

1. Set `JAVA_HOME` to: *`REPOSITORY_LOCATION`*`/jdk`
2. Invoke `idmProvisioningWizard.sh` on Linux or UNIX.
3. Select **Provision an Identity Management Environment** in the Oracle Identity Management Installation Options page and specify the `provisioning.rsp` file created in Create an Oracle Identity Management Provisioning Profile (page 10-2).

MANDATORY:

- Use the Oracle Identity Management Provisioning Wizard for provisioning for a single node topology.
- Use the command line (runIDMProvisioning) for provisioning for a multiple node topology.
- Use the Oracle Identity Management Provisioning Wizard to monitor the provisioning for a multiple node install. Run the Oracle Identity Management Provisioning Wizard only on the primordial host, IDMHOST1.

Then proceed as described in the following sections.

In the Prerequisite Checks, Installation, Preconfigure, Configure, Configure Secondary, Postconfigure, and Startup pages, the Status of each build is indicated by one of these icons:

- **Block**: Processing has not yet started for the named phase.
- **Clock**: Performing the build for a phase.
- **Check** mark: The build was completed successfully.
- **x** mark: The build has failed for this phase. Correct the errors beforecontinuing.

Click an **x** to display information about failures. Click the host-level **Log** file for details about this phase. Click a build **Log** file to see details specific to that build.

In case of errors, manually clean up everything. Kill all running processes, delete the directories, rerun RCU, and start over from the beginning.

- Identity Management Installation Options Page (page 10-18)
- Install Location Configuration Page (page 10-18)
- Review Provisioning Configuration Page (page 10-19)
- Summary Page (page 10-19)
- Prerequisite Checks Page (page 10-19)
- Installation Page (page 10-19)
- Preconfigure Page (page 10-20)
- Configure Page (page 10-21)
- Configure Secondary Page (page 10-21)

- Postconfigure Page (page 10-21)
- Startup Page (page 10-22)
- Validation Page (page 10-22)
- Install Complete (page 10-22)

10.4.2.1 Identity Management Installation Options Page

Select **Provision an Identity Management Environment** to use an existing provisioning response file to provision the environment.

If the Oracle Identity Management topology spans multiple hosts, make the provisioning response file accessible to all hosts (preferrably by including it on shared storage) and run the provisioning tool on each host other than the primordial host, where the Oracle Identity Management Provisioning Wizard is running. This is explained in more detail on the Installation page.

In the **Response File** field, specify the path name of the file to be used, either by typing it in the field or by clicking the **Browse** button, navigating to the desired file, and selecting it.

Click **Next** to continue.

10.4.2.2 Install Location Configuration Page

The Install Location Configuration page allows to modify the details entered previously when the response file was created. For details about the settings on this page, see Install Location Configuration Page (page 10-4).

Installation and Configuration.

- **Software Repository Location**: Specify the location of the software repository, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it.
- **Software Installation Location**: Specify the location on shared storage where the Middleware Home is placed, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it.
- **Shared Configuration Location**: Specify the shared configuration location, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it.
- **Enable Local Configuration Location**: Do not select this checkbox if a single host environment is being provisioned.

  Select this checkbox to run Managed Servers from a local disk on the host, visible only to the processes running on that host. If this option is enabled, the Oracle Identity Management Provisioning Wizard copies the domain configuration from the shared location and places it on the local disk specified. This configures all Managed Servers to run from the non-networked location.

  – **Local Configuration Location**: Specify the location for the local domain directory to be set up, either by typing it in the field or by clicking the **Browse** button, navigating to the desired location, and selecting it. This field is required if the option **Enable Local Applications Configuration** is selected. The specified directory must initially be empty.

10.4.2.3 Review Provisioning Configuration Page

The Review Provisioning Configuration page enables to select configurations you want to review. Select a configuration and click **Next** to view the corresponding configuration page.

- **Node Topology Configuration**
- **Virtual Hosts Configuration**
- **Common Passwords**
- **OID: Oracle Internet Directory Configuration**
- **ODSM: Oracle Directory Services Manager Configuration**
- **OHS: Oracle HTTP Server Configuration**
- **OAM: Oracle Access Manager Configuration**
- **OIM: Oracle Identity Manager Configuration**
- **Load Balancer Configuration**

Click **Next** to continue.

10.4.2.4 Summary Page

Use the Summary page to view a summary of the selections and enter additional information.

Review the information displayed to ensure that the installation details are correct. To make changes, click **Back** to return to previous screens in the interview.

Click **Next** to continue.

10.4.2.5 Prerequisite Checks Page

Use the Prerequisite Checks page to observe the progress of the preverification steps. During this stage, the Oracle Identity Management Provisioning Wizard checks for the basic prerequisites, such as free disk space, port availability, and Database connections.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next** to continue.

10.4.2.6 Installation Page

Use the Installation page to install the Oracle Fusion Middleware products. The host is marked with a Home symbol in the Host column. The Domains column lists the domains deployed in the new environment.

For the EDG topology, if the provisioning directory is not shared onto the WEBHOSTs, manually copy the following directories from IDMHOST1 to the local provisioning directories on those hosts. Do this BEFORE running the install on those hosts and AFTER completing the install phase on IDMHOST2.

Please note EDG Topology is only supported on Linux or UNIX platforms.

```
IDM_CONFIG/lcmconfig/topology
```

```
IDM_CONFIG/lcmconfig/credconfig
```

For example:

```
scp -r IDM_CONFIG/lcmconfig/topology WEBHOST1:IDM_CONFIG/lcmconfig/
```

```
scp -r IDM_CONFIG/lcmconfig/credconfig WEBHOST1:IDM_CONFIG/lcmconfig/
```

During this stage, the Oracle Identity Management Provisioning Wizard installs the software bits and applies the patches present in the repository.

In a terminal session on the hostprimary, secondary, and DMZ host (if present), run the install phase with the command:

Linux or UNIX:

```
runIDMProvisioning.sh -responseFile IDMLCM_HOME/provisioning/bin/
provisioning.rsp -target install
```

See the note at the beginning of Monitoring Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

For Solaris only, after the IDM provisioning installation target completes, perform the following steps to manually replace the OPatch under IDM oracle homes:

- Download the latest OPatch from My Oracle Support (patch number 25816288) to any local storage on the provisioning host.
- Manually replace the OPatch directory in all IDM oracle homes as shown below:

  ```
  cd <ORACLE_HOME>
  mv -f OPatch OPatch_orig
  unzip <Patch_location>/p25816288_122001_Generic.zip
  ```

  Below is the list of oracle homes to be updated:

  ```
  /u01/products/dir/oid
  /u01/products/dir/oracle_common
  /u01/products/app/idm
  /u01/products/app/iam
  /u01/products/app/oracle_common
  /u01/products/ohs/ohs
  /u01/products/ohs/webgate
  /u01/products/ohs/oracle_common
  ```

Click **Next** to proceed.

10.4.2.7 Preconfigure Page

During this stage, the Oracle Identity Management Provisioning Wizard configures Oracle Internet Directory, Oracle Virtual Directory, and Oracle Directory Services Manager. It also creates the domain and extends it for all the necessary components.

In a terminal session on the hostprimary, secondary, and DMZ host (if present), run the preconfigure phase with the command:

```
runIDMProvisioning.sh -responseFile IDMLCM_HOME/provisioning/bin/
provisioning.rsp -target preconfigure
```

Linux or UNIX:

```
runIDMProvisioning.bat  -responseFile IDMLCM_HOME\provisioning/bin/
provisioning.rsp -target preconfigure
```

Note: Each new phase must run sequentially; that is, a new phase cannot be started until the previous phase has been completed successfully on all the hosts.

See the note at the beginning of Monitoring Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Note: If a DMZ host is present, recopy the response file to the DMZ host.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the configure phase on the primordial host and displays the Configure screen.

10.4.2.8 Configure Page

During this stage, the Oracle Identity Management Provisioning Wizard performs OIM configuration.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the Configure-secondary phase on the primordial host and displays the Configure Secondary screen.

10.4.2.9 Configure Secondary Page

During this stage, the Oracle Identity Management Provisioning Wizard performs Oracle Identity Manager-Oracle Access Manager integration.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the Postconfigure phase on the primordial host and displays the Postconfigure screen.

10.4.2.10 Postconfigure Page

During this stage, the Oracle Identity Management Provisioning Wizard performs tuning and enables the environment for SSL communication. Oracle Identity Federation is configured in this stage.

Copying WebGate Configuration Files to WEBHOST1 and WEBHOST2

This is applicable only for EDG topology when the OHS is on a DMZ host. EDG Topology is only supported on Linux or UNIX platforms.

When configuring WebGate during the postconfigure stage, the provisioning tool requires access to files created on the primordial host. So BEFORE postconfigure is run on WEBHOST1 and WEBHOST2, copy the entire directory *IDM_CONFIG/domains/IDMDomain/output* to the same location on WEBHOST1 and WEBHOST2.

For example:

`scp -r IDMHOST1:$`*`IDM_CONFIG/domains/IDMDomain`*`/output WEBHOST1:$`*`IDM_CONFIG/domains/IDMDomain`*

Before making the copy, it might be necessary to manually create the directory *IDM_CONFIG/domains/IDMDomain* on WEBHOST1 and WEBHOST2. After provisioning is complete, remove this directory from WEBHOST1 and WEBHOST2.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the Startup phase on the primordial host and displays the Startup screen.

10.4.2.11 Startup Page

During this stage, the Oracle Identity Management Provisioning Wizard starts or restarts all the services except for Oracle Identity Federation. To use Oracle Identity Federation, run it manually as a post-installation task described in Configure Oracle Identity Federation (page 16-23).

The Domains column lists the domains deployed in the new environment.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the Validate phase on the primordial host and displays the Validation screen.

10.4.2.12 Validation Page

During this stage, the Oracle Identity Management Provisioning Wizard performs the basic validations, such as server status and Oracle Internet Directory connectivity.

The host is marked with a Home symbol in the Host column. The Domains column lists the domains deployed in the new environment.

See the note at the beginning of Monitor Provisioning Using the Oracle Identity Management Provisioning Wizard (page 10-17) for information about viewing build status on this page.

Click **Next**. The Oracle Identity Management Provisioning Wizard starts the Validate phase on the host and displays the Validation screen.

10.4.2.13 IDM Provisioning Complete

This page appears after provisioning has completed successfully. It shows a summary of the products that have been installed.

Click **Finish** to save the summary and exit the Oracle Identity Management Provisioning Wizard.

10.5 Perform Mandatory Oracle Identity Management Post-Installation Tasks

This section describes tasks that must be performed after Oracle Identity Management is provisioned.

10.5.1 Create ODSM Connections to Oracle Virtual Directory

Before managing Oracle Virtual Directory, create connections from ODSM to each of the Oracle Virtual Directory instances. To do this, proceed as follows:

1. Access ODSM through the load balancer at: `http://ADMIN.mycompany.com/odsm`
2. To create connections to Oracle Virtual Directory, follow these steps. Create connections to each Oracle Virtual Directory node separately. Using the Oracle Virtual Directory load balancer virtual host from ODSM is not supported:
   a. Create a direct connection to Oracle Virtual Directory on LDAPHOST1 providing the following information in ODSM:

      `Host`: `LDAPHOST1.mycompany.com`

      `Port`: `8899` (The Oracle Virtual Directory proxy port, *`OVD_ADMIN_PORT`*)

      Enable the SSL option.

      `User`: `cn=orcladmin`

      `Password`: password_to_connect_to_OVD

   b. Create a direct connection to Oracle Virtual Directory on LDAPHOST2 providing the following information in ODSM:

      `Host`: `LDAPHOST2.mycompany.com`

      `Port`: `8899` (The Oracle Virtual Directory proxy port)

      Enable the SSL option.

      `User`: `cn=orcladmin`

      `Password`: password_to_connect_to_OVD

10.5.2 Pass Configuration Properties File to Oracle Fusion Applications

Oracle Fusion Applications requires a property file which details the Oracle Identity Management deployment. After provisioning, this file can be found at the following location:

`IDM_CONFIG``/fa/idmsetup.properties`

10.6 Validate Provisioning

The provisioning process includes several validation checks to ensure that everything is working correctly. This section describes additional checks that can be performed for additional sanity checking

10.6.1 Validate the Administration Server

Validate the WebLogic Administration Server as follows by verifying connectivity

Verify that the administration console can be accessed from the following URL:

`http://admin.mycompany.com/console` and logging in as the user weblogic_idm.

Verify that all managed servers are showing a status of Running.

Verify that Oracle Enterprise Manager Fusion Middleware Control can be accessed from the URL:

`http://admin.mycompany.com/em` and logging in as the user weblogic_idm.

10.6.2 Validate the Oracle Access Manager Configuration

To validate that this has completed correctly.

1. Access the OAM console at: `http://ADMIN.mycompany.com/oamconsole`
2. Log in as the Oracle Access Manager user.
3. Click the **System Configuration** tab
4. Expand **Access Manager Settings** - **SSO Agents** - **OAM Agents**.
5. Click the open folder icon, then click **Search**.
6. See the WebGate agents `Webgate_IDM`, `Webgate_IDM_11g` and `IAMSuiteAgent`.

10.6.3 Validate Oracle Directory Services Manager (ODSM)

This section describes how to validate the connection to the ODSM site in a browser and also ODSM connections to Oracle Internet Directory.

10.6.3.1 Validate Browser Connection to ODSM Site

Follow these steps to validate that the Oracle Directory Services Manager (ODSM) site can be accessed:

1. In a web browser, verify it is possible to connect to ODSM at:

   `http://`*`HOSTNAME`*`.mycompany.com:`*`port`*`/odsm`

   For example, on IDMHOST1, enter this URL, where `7005` is *`ODSM_PORT`*

   `http://IDMHOST1.mycompany.com:7005/odsm`

   and on IDMHOST2, enter this URL:

   `http://IDMHOST2.mycompany.com:7005/odsm`

2. In a web browser, verify that ODSM can be accessed through the load balancer address:

   `http://ADMIN.mycompany.com/odsm`

10.6.3.2 Validate ODSM Connections to Oracle Internet Directory

Validate that Oracle Directory Services Manager can create connections to Oracle Internet Directory.

Create a connection to the Oracle Internet Directory on each ODSM instance separately. Even though ODSM is clustered, the connection details are local to each node. Proceed as follows:

1. Launch Oracle Directory Services Manager from IDMHOST1:

   `http://IDMHOST1.mycompany.com:7005/odsm`

2. Create a connection to the Oracle Internet Directory virtual host by providing the following information in ODSM:
   - Server: `OIDSTORE.mycompany.com`
   - Port: `636` (*`LDAP_LBR_SSL_PORT`*)
   - Enable the SSL option
   - User: `cn=orcladmin`
   - Password: *`ldap-password`*
3. Launch Oracle Directory Services Manager from IDMHOST2.

   Follow Step 3 to create a connection to Oracle Internet Directory from IDMHOST2

   `http://IDMHOST2.mycompany.com:7005/odsm`

4. Create a connection to the Oracle Internet Directory virtual host by providing the corresponding information in ODSM

Accept the certificate when prompted.

10.6.4 Validate WebGate and the Oracle Access Manager Single Sign-On Setup

To validate that WebGate is functioning correctly, open a web browser and go the OAM console at: `http://ADMIN.mycompany.com/oamconsole`

The Oracle Access Manager Login page is displayed. Enter the OAM administrator user name (for example, `oamadmin`) and password and click **Login**. Then, see the Oracle Access Manager console displayed.

To validate the single sign-on setup, open a web browser and go the WebLogic Administration Console at `http://ADMIN.mycompany.com/console` and to Oracle Enterprise Manager Fusion Middleware Control at: `http://ADMIN.mycompany.com/em`

The Oracle Access Manager Single Sign-On page displays. Provide the credentials for the `weblogic_idm` user to log in.

10.7 Manage the Topology for an Oracle Identity Management Enterprise Deployment

This section describes the operations to perform after setting up the Oracle Identity Management topology.

10.7.1 Start and Stop Components

This section describes how to start, stop and restart the various components of the Oracle Enterprise Deployment for Oracle Identity Management.

This section contains the following topics:

- Startup Order (page 10-26)
- Start and Stop Servers (page 10-26).

10.7.1.1 Startup Order

When starting up the entire infrastructure, start the components in the following order, ignoring those not in the topology:

1. Database(s)
2. Database Listener(s)
3. Oracle Internet Directory
4. Node Manager
5. WebLogic Administration Server
6. Oracle Access Manager Server(s)
7. Oracle HTTP Server(s)

10.7.1.2 Start and Stop Servers

During provisioning, scripts are created in the *SHARED_ROOT*`/config/scripts` directory to start and stop all the servers in the environment. Two of the scripts are available to use from the command line to start and stop all Oracle Identity Management servers. The remaining scripts are used internally and must not be invoked from the command line.

These scripts do NOT stop or start the database.

10.7.1.2.1 Start All Servers

Provisioning created a file called `startall.sh` for Linux. To start everything in the correct order run the command on hosts in the following order:

- LDAPHOST1
- LDAPHOST2
- IDMHOST1
- IDMHOST2

- WEBHOST1
- WEBHOST2

To start the services on a single host, execute the command on that host.

Before invoking this script, set `JAVA_HOME` to *`JAVA_HOME`*.

During execution the Weblogic and Node Manager administrator passwords are requested.

The script starts the servers in the following order:

1. Node Manager1
2. AdminServer
3. wls_ods1
4. wls_oam1
5. wls_oif1
6. ohs1
7. oid1
8. oid2
9. ohs2
10. Node Manager 2
11. wls_ods2
12. wls_oam2
13. wls_oif2

10.7.1.2.2 Stop All Servers:

The script to stop all servers is `stopall.sh` for Linux.

Before invoking this script, set `JAVA_HOME` to *`JAVA_HOME`*.

During execution the Weblogic and Node Manager administrator passwords are requested.

10.7.2 About Oracle Identity Management Console URLs

Table 10-1 (page 10-27) lists the administration consoles used in this guide and their URLs.

Table 10-1 Console URLs

Domain	Console	URL
IDMDomain	WebLogic Administration Console	`http://ADMIN.mycompany.com/console`
IDMDomain	Enterprise Manager FMW Control	`http://ADMIN.mycompany.com/em`
IDMDomain	OAM Console	`http://ADMIN.mycompany.com/oamconsole`

Table 10-1 (Cont.) Console URLs

Domain	Console	URL
IDMDomain	ODSM	`http://ADMIN.mycompany.com/odsm`

10.7.3 Perform Backups During Installation and Configuration

It is an Oracle best practices recommendation to create a backup after successfully completing the installation and configuration of each tier, or at another logical point. Create a backup after verifying that the installation so far is successful. This is a quick backup for the express purpose of immediate restoration in case of problems in later steps. The backup destination is the local disk. Discard this backup when the enterprise deployment setup is complete. After the enterprise deployment setup is complete, initiate the regular deployment-specific Backup and Recovery process.

See Introducing Backup and Recovery in the *Oracle Fusion Middleware Administering Oracle Fusion Middleware*.

For information on database backups, see Introduction to Backup and Recovery in the *Oracle Database Backup and Recovery User's Guide*.

This section contains the following topics:

- Back Up Middleware Home (page 10-28)
- Back Up LDAP Directories (page 10-28)
- Back Up the Database (page 10-29)
- Back Up the WebLogic Domain (page 10-29)
- Back Up the Web Tier (page 10-29)

10.7.3.1 Back Up Middleware Home

Back up the Middleware homes whenever a new one is created or a components is added to it. The Middleware homes used in this guide are Oracle Identity Management and Oracle Identity and Access Management.

10.7.3.2 Back Up LDAP Directories

Whenever an action, which updates the data in LDAP, is performed, back up the directory contents.

This section contains the following topics:

- Back up Oracle Internet Directory (page 10-28)
- Back up Oracle Virtual Directory (page 10-29)
- Back Up Third-Party Directories (page 10-29)

10.7.3.2.1 Back up Oracle Internet Directory

To back up an Oracle Internet Directory instance:

1. Shut down the instance using `opmnctl` located under the *`OID_ORACLE_INSTANCE`*`/bin` directory:

   `OID_ORACLE_INSTANCE``/bin/opmnctl stopall`

2. Back up the Database hosting the Oracle Internet Directory data and the Oracle Internet Directory instance home on each host.
3. Start up the instance using `opmnctl` located under the *`OID_ORACLE_INSTANCE`*`/bin` directory:

   `OID_ORACLE_INSTANCE``/bin/opmnctl startall`

10.7.3.2.2 Back up Oracle Virtual Directory

To back up an Oracle Virtual Directory instance:

1. Shut down the instance using `opmnctl` located under the *`OVD_ORACLE_INSTANCE`*`/bin` directory:

   `OVD_ORACLE_INSTANCE``/bin/opmnctl stopall`

2. Back up the Oracle Virtual Directory Instance home on each LDAP host.
3. Start up the instance using `opmnctl` located under the *`OVD_ORACLE_INSTANCE`*`/bin` directory:

   `OVD_ORACLE_INSTANCE``/bin/opmnctl startall`

10.7.3.2.3 Back Up Third-Party Directories

Refer to the operating system vendor's documentation for information about backing up directories.

10.7.3.3 Back Up the Database

Whenever you create add a component to the configuration, back up the IDMDB database. Perform this backup after creating domains or adding components such as Access Manager or Oracle Identity Manager.

10.7.3.4 Back Up the WebLogic Domain

To back up the WebLogic domain, perform these steps:

1. Shut down the WebLogic administration server and any managed servers running in the domain as described in Start and Stop Components (page 10-26).
2. Back up the *`ASERVER_HOME`* directory from shared storage.
3. Back up the *`MSERVER_HOME`* directory from each host.
4. Restart the WebLogic Administration Server and managed servers.

10.7.3.5 Back Up the Web Tier

To back up the Web Tier, perform these steps:

1. Shut down the Oracle HTTP Server as described in Start and Stop Components (page 10-26).
2. Back up the Oracle HTTP Server.

3. Start the Oracle HTTP Server as described in Start and Stop Components (page 10-26).

10.8 Next Steps

Go to Troubleshoot Oracle Identity Management Provisioning (page 11-1) which describes common problems that might be encountered when using Oracle Identity Management Provisioning and explains how to solve them.

11

Troubleshoot Oracle Identity Management Provisioning

This section describes common problems that might be encountered when using Oracle Identity Management Provisioning and explains how to solve them.
In addition to this section, review the *Oracle Fusion Middleware Error Messages* guide for information about the encountered error messages.

This section contains the following topics:

- Get Started with Troubleshooting (page 11-1)
- Resolve Common Problems (page 11-2)
- Use My Oracle Support for Additional Troubleshooting Information (page 11-5)
- What To Do Next (page 11-5)

11.1 Get Started with Troubleshooting

This section describes how to use the log files and how to recover from provisioning failures. It contains the following topics:

- Use the Log Files (page 11-1)
- Recover From Oracle Identity Management Provisioning Failure (page 11-1)

11.1.1 Use the Log Files

To monitor provisioning using the wizard, click the icon under the **Log** field from any phase screen to see the logs for the current phase. The logs are searchable using the search box at the top of this new window. The log window does not refresh on its own, so click **Refresh** besides the search box at the top of this window to refresh the logs.

To check why a phase failed when the wizard is not running, check the corresponding logs files present under the logs directory using the following commands.

On Linux: *`INSTALL_APPCONFIG_DIR`*`/provisioning/logs/`*`hostname`*.

11.1.2 Recover From Oracle Identity Management Provisioning Failure

Oracle Identity Management Provisioning does not have any backup or recovery mechanism, so it is necessary to start from the beginning in case of a failure.

If a workaround that requires to rerun Oracle Identity Management Provisioning is performed, clean up the environment before rerunning it. Do the following:

1. Reboot the hosts to ensure that all running Oracle Identity Management processes are stopped.
2. Delete the content of the following directories on all hosts:

- `Software Install Location`
- `Shared Configuration Location`
- `Local Configuration Location`

3. Drop the database schema using Oracle Fusion Middleware RCU. While dropping the schema, ensure that t the ODS schema is selected. Oracle Identity Management Provisioning fails when it is run the next time. By default, all schemas except ODS schema are selected.
4. Create the database schema using Oracle Fusion Middleware RCU.

11.2 Resolve Common Problems

This section describes common problems and solutions. It contains the following topics:

- Provisioning Fails (page 11-2)
- OID Account is Locked (page 11-2)
- Missing ODSM Instance Directory on Second Node (page 11-3)
- Null Error Occurs When WebLogic Patches Are Applied (page 11-3)
- Oracle Identity Management Patch Manager Progress Command Shows Active Session After Provisioning (page 11-3)
- False OPatch Error Messages Printed to Log During Install Phase (page 11-4)
- Oracle Identity Management Provisioning Wizard Hangs (Linux and UNIX) (page 11-4)
- Provisioning Fails During Install Phase (Linux) (page 11-4)

11.2.1 Provisioning Fails

Problem

Provisioning fails.

Solution

Check the provisioning logs located in the directory:

INSTALL_APPCONFIG_DIR`/provisioning/logs/`*hostname*

where *`hostname`* is the host where the provisioning step failed.

11.2.2 OID Account is Locked

Problem

Investigation into the OID logs shows that the OID account is locked.

This is generally caused by the load balancer. The load balancer is continually polling OID to see if it is available using the given credentials. During setup, this can cause the account to become locked.

Solution

Disable the OID load balancer monitor during preconfiguration. Then enable it when provisioning is complete. Another alternative is to reduce the check frequency.

11.2.3 Missing ODSM Instance Directory on Second Node

Problem

After running the Oracle Identity Management Provisioning Wizard, only one instance directory for Oracle Directory Services Manager is installed.

Solution

The absence of the ODSM instance directory on the second node does not result in any loss of function.

11.2.4 Null Error Occurs When WebLogic Patches Are Applied

Problem

During Oracle Identity Management Provisioning, patches are applied to all products provisioned, including WebLogic. This entails running the Smart Update `bsu` command. This command may fail without producing a detailed error message.

Cause

In this case, the failure is likely caused by directory paths that are longer than what the `bsu` command supports. Verify this by running the `bsu` command manually, passing it the `-log` option, and looking for a stack trace containing a message such as the following:

```
java.lang.IllegalArgumentException:
Node name?a?very?long?path?which?may?cause?problems?leading?to?an?IDMTOP?
products?dir?utils?bsu?cache_dir too long
```

See Using the Command Line Interface in the *Oracle Smart Update Applying Patches to OracleWebLogic Server* guide.

Solution

When planning the Oracle Identity Management deployment, ensure that the `IDM_TOP` path is 45 characters or fewer in length.

11.2.5 Oracle Identity Management Patch Manager Progress Command Shows Active Session After Provisioning

Problem

If the Oracle Identity Management Patch Manager `progress` command is run after Oracle Identity Management Provisioning completes, the output shows an active session specific to Oracle Identity Management Provisioning, which is listed as ACTIVE, and contains a set of PLANNED steps.

Solution

Safely ignore this output. The provisioning-driven patch session is complete, and all steps which needed to run have run. Creating a new patch session silently replaces this special session without error.

11.2.6 False OPatch Error Messages Printed to Log During Install Phase

Problem

During the install phase of provisioning, a message `Starting binary patching for all-binary-patch components ...` might be displayed, followed by a series of OPatch failure messages prefaced with the string `prepatch` within the provisioning log. These errors contain the string `Failed to load the patch object`.

Solution

These messages are harmless and can be safely ignored.

11.2.7 Oracle Identity Management Provisioning Wizard Hangs (Linux and UNIX)

Problem

The Oracle Identity Management Provisioning Wizard hangs. Neither the **Next** nor the **Back** button is active.

Cause

This problem is due to stale Network File System (NFS) file handles.

Solution

On Linux or UNIX, issue the following command:

```
df –k
```

Record the output of the `df` command, even if it is successful, in case further analysis is necessary. For example, take a screenshot.

If the `df` command hangs or is unsuccessful, work with the system administrator fix the NFS problem.

After the NFS problem has been resolved and the `df` command finishes successfully, run provisioning again.

11.2.8 Provisioning Fails During Install Phase (Linux)

Problem

Provisioning fails during the Install phase.

Cause

Some 32-bit libraries such as `crt1.o` are missing.

Solution

There are two ways to fix this. Do one of the following:

- Copy the 32-bit libraries `gcrt1.o`, `crtn.o`, `crti.o`, `crt1.o`, `Scrt1.o`, and `Mcrt1.o` from `/usr/lib/` on another machine running the same version.

- Install the missing package `glibc-devel.i686`

11.3 Use My Oracle Support for Additional Troubleshooting Information

Use My Oracle Support (formerly MetaLink) to help resolve Oracle Fusion Middleware problems. My Oracle Support contains several useful troubleshooting resources, such as:

- Knowledge base articles
- Community forums and discussions
- Patches and upgrades
- Certification information

Use My Oracle Support to log a service request. Access My Oracle Support at `https://support.oracle.com`.

11.4 Next Steps

Go to Create a Response File (page 12-1) which describes the process of creating a response file for a new Oracle Fusion Applications environment using the Provisioning Wizard interview process.

12

Create a Response File for a New Oracle Fusion Applications Environment

This section describes the process of creating a response file for a new Oracle Fusion Applications environment using the Provisioning Wizard interview process.
This section includes the following topics:

- Introduction to Creating a Response File (page 12-1)
- Prerequisites to Creating a Response File (page 12-3)
- Create a Response File (page 12-4)
- Update an Existing Response File (page 12-31)
- What to Do Next (page 12-32)

12.1 Introduction to Creating a Response File

Oracle Fusion Applications Provisioning orchestrates the physical installation and configuration of the selected product offerings and deploys those offerings and their dependent middleware components to a predetermined Oracle WebLogic Server Domain. To perform the installation tasks, provisioning requires the provisioning repository of installers, the provisioning framework, and a response file.

When a response file is created, choose provisioning configurations and specify the configuration details for the product offerings and their dependent middleware components. Save the response file and specify its location when it is ready to be used to provision a new environment.

12.1.1 How Does the Response File Work?

The provisioning repository must have been downloaded, the provisioning framework must be installed, and a database and the identity management components must be also installed before creating a response file. See Preparing the Oracle Fusion Applications Server (page 5-6) for provisioning prerequisites.

After the prerequisite setup is complete, run the Provisioning Wizard and select the **Create a New Applications Environment Response File** option. During the interview process, choose the product offerings to install. The wizard knows which middleware dependencies must be installed for each product offering, and which host must be provisioned first. It detects common products that each offering relies on, as well as the presence of the transaction database and identity-related components, and prompts for the appropriate configuration parameters.

Using a question and answer interview format, the wizard collects information about:

- Provisioning configurations (product offerings)
- Node Manager credentials and installation and configuration directories
- Database connections and schema passwords

- Host names and ports for the offerings and their middleware dependencies
- Common configuration details for components, such as web tier, virtual hosts, email, and identity management

After completing the response file, save it. Then, to perform the physical installation, choose the **Provision a New Environment** option from the Provisioning Wizard and indicate the location of the response file. The wizard uses the details in the response file as a guide to what must be retrieved from the provisioning repository.

12.1.2 Select Product Offerings

An installation of Oracle Fusion Applications is logically broken up into groups of features known as **product offerings**, which represent the highest-level collection of functionality that can licensed and implemented. A **provisioning configuration** is a collection of one or more product offerings.

Product offerings have interdependencies on companion applications (for example Oracle Fusion Human Capital Management relies on Oracle Financials payroll), as well as middleware dependencies (for example, Oracle SOA Suite) required for runtime execution. The wizard prompts for applications and middleware configuration details at the domain level during Domain Topology Configuration.

When individual product offerings are selected within a configuration instead of selecting all offerings within the configuration, the wizard starts the Managed Servers *only for the offerings selected*. However, because the interdependent details for the entire configuration are included in the response file, it is possible to activate additional functionality later by using the Oracle Fusion Applications Functional Setup Manager to start the other Managed Servers.

The provisioning configurations are as follows:

- Oracle Fusion Customer Relationship Management (Sales and Marketing)
- Oracle Fusion Financials (Financials, Oracle Fusion Procurement, and Oracle Fusion Projects)
- Oracle Fusion Accounting Hub
- Oracle Fusion Human Capital Management (Workforce Deployment, Workforce Development, and Compensation Management)
- Oracle Fusion Supply Chain Management (Product Management, Order Orchestration, Material Management and Logistics, Supply Chain Financial Orchestration, Manufacturing and Supply Chain Material Management, Price Management)

Choose also several standalone product offerings. For this group of offerings, only the direct dependencies are installed, configured, and deployed:

- Customer Data Hub
- Enterprise Contracts
- Oracle Fusion Accounting Hub
- Oracle Fusion Incentive Compensation
- Value Chain Planning

12.1.3 Wizard Actions for Oracle Identity Management Components

During the Provisioning Wizard interview process, the wizard collects information that is necessary to connect to the Oracle Identity Management components previously installed and configured. This information includes:

- The user designated as the Super User. This user must already exist in the policy store.
- The existence of the system administrators group. This information determines if the group was created during the Oracle Identity Management component installation and configuration process, or if it must be created during provisioning.
- The distinguished name (DN) of the system administrators group (if it exists).
- The authenticator that serves as the LDAP identity store: Oracle Internet Directory (OIDAuthenticator).

12.1.4 Create Installation-Specific Response Files

There are numerous scenarios for the environments than can be created from a small demonstration system to a full production system provisioned on multiple hosts. The Provisioning Wizard can accommodate the creation of response files for specific environments so that a separate response file can be created for each type of environment. Note that all occurrences of a `hostname` should use the same name in the response file.

12.1.5 Update a Response File

Frequently, details for a response file are not final, and so cannot be specified during a single pass through the Provisioning Wizard interview. Or, a completed response file has not been implemented, and requires changes before it is. The wizard options include the choice to save a partially completed response file and update it later. Note that a response file is not complete or available for provisioning until clicking **Finish** on the **Summary** screen.

However, after selecting product offerings and saving them in a response file, regardless of whether it is partially or fully complete, the product offerings cannot be updated or changed in that response file. To add or change the mix of offerings, create a new response file and specify the new or additional offerings.

12.2 Prerequisites to Creating a Response File

Before creating a response file, the following tasks must be completed:

1. Read and understand the concepts in Overview (page 1-1).
2. Perform the prerequisite tasks outlined in Prepare for an Installation (page 5-1).
3. Install a transaction database as described in Install Oracle Fusion Applications Transaction Database (page 8-1).
4. Complete Oracle Identity Management provisioning. See Oracle Identity Management Provisioning (page 10-1).

5. To enable load balancer as described in Load Balancer Configuration (page 12-22), ensure that the load balancer configuration is completed as described in Plan Load Balancer Requirements (page 4-3) before proceeding.

12.3 Create a Response File

Complete the wizard interview screens and save the response file in a location that is accessible to the various installers. Record the location, as it must be supplied during the provisioning of the environment. Note that he response file should be created on the Primordial host, which is the host that contains the Administration Server of the Common domain.

The wizard warns if it cannot connect to the database or any of the hosts specified in the response file and if any of the passwords are not valid. If this warning represents an exception, ignore it and continue creating the response file. However, all issues flagged in the warnings *must* fixed before starting to provision an environment. Provisioning cannot be successfully run until all validations have passed.

12.3.1 Start the Provisioning Wizard

The Provisioning Wizard supports the following command line options:

Table 12-1 Provisioning Wizard Command Line Options

Command Line Option	Description	Default Value
`-invPtrLoc [inventory pointer file name]`	Location of the `oraInst.loc` file.	`/etc/oraInst.loc`
`-ignoreSysPrereqs [true|false]`	Disables validation for database, schema and hosts. Most validation errors are ignored. **Note:** `-ignoreSysPrereqs true` is the same as `-ignoreSysPrereqs` with no value specified.	false
`-help`	Displays help text. **Note:** The `-multitenant` option is displayed when the `-help` option is used. This option is not available for 11*g* Release 11 (11.1.11) and is reserved for future use.	

Usage:

```
provisioningWizard.sh -invPtrLoc <inventory pointer location file>

-ignoreSysPrereqs {true|false}

-help
```

To start the Provisioning Wizard, do the following on the primordial host:

1. Set the *JAVA_HOME* environment variable to point to the JDK location in the provisioning repository, for example:

   UNIX:

```
export JAVA_HOME=repository_location/jdk
```

```
export PATH=$JAVA_HOME/bin:$PATH
```

This environment variable is not required while creating a response file. However, it is required for provisioning an environment. See Start the Wizard and Preparing to Install (page 13-5).

2. Verify that the `LIBPATH` value is null.
3. On UNIX systems, set the DISPLAY environment variable to an active and authorized display.
4. Run the following command on the primordial host. See Types of Hosts in a Multiple-Host Environment (page 1-14).

   UNIX:

   ```
   cd framework_location/provisioning/bin
   ```

   ```
   ./provisioningWizard.sh
   ```

   Solaris:

   ```
   cd framework_location/provisioning/bin
   ```

   ```
   bash provisioningWizard.sh
   ```

Example 12-1

```
provisioningWizard.sh -invPtrLoc /oracle/oraInst.loc
-ignoreSysPrereqs
```

12.3.2 Wizard Screens and Instructions

Table 12-2 (page 12-5) shows the steps necessary to create a response file using the Provisioning Wizard. For help with any of the screens, click **Help**.

WARNING: If the correct values required are not entered, the error and warning messages are displayed at the bottom of the screen.

Table 12-2 Creating a Response File

Screen	Description and Action Required
Welcome	No action is required on this read-only screen. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Specify Central Inventory Directory	This screen displays only if one or more of the following conditions are not met: • The `-invPtrLoc` option is used to specify the central inventory location. Thus, the default value for the platform is not used. Note that the default value for Linux platforms is `/etc/oraInst.loc` . For Solaris, the default value is `/var/opt/oracle/oraInst.loc`. • The Central Inventory Pointer File is readable. • The Central Inventory Pointer File contains a value for `inventory_loc`. • The `inventory_loc` directory is writable. • The `inventory_loc` directory has at least 150K of space. • `inventory_loc` is not an existing file. Specify the location of the **Central Inventory Directory** that meets the previous criteria. The `inventory_loc` directory can be created by the `createCentralInventory.sh` script and does not have to exist at the time its location is specified. For non-Windows platforms, in the **Operating System Group ID** field, select or enter the group whose members are granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. The **Inventory Location Confirmation** dialog prompts to run the *`inventory_directory`*`/createCentralInventory.sh` script as root, to confirm that all conditions are met and to create the default inventory location file, such as `/etc/oraInst.loc`. After this script runs successfully, return to the interview and click **OK** to proceed with the installation. To continue the installation without root access, select **Continue installation with local inventory**. Click **OK** to proceed with the installation. For Windows platforms, this screen displays if the inventory directory does not meet requirements. For more information about inventory location files, see Oracle Universal Installer Inventory in the *Oracle Universal Installer User's Guide*. Click **Next** to continue.
Installation Options	Presents the list of valid installation actions that can be performed using the wizard. Select **Create a New Applications Environment Response File**. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Specify Security Updates	Set up a notification preference for security-related updates and installation-related information from My Oracle Support. This information is optional. • **Email**: Enter a valid email address to have updates sent by this method. • **Agree to receive security updates via My Oracle Support**: This option is used to have updates sent directly to a My Oracle Support account. However, in this release, this feature is not supported. Thus, this option should not be selected. Click **Next** to continue.
Provisioning Configurations	Select one or more offerings, either within a configuration, or from the list of standalone product offerings. **Tip: This value is available in the** *Oracle Fusion Applications Installation Workbook*, **Provisioning** tab, **Fusion Applications Offerings** table. Select individual product offerings within a configuration, without selecting all available offerings. When individual product offerings are specified, provisioning starts the Managed Servers *only for the offerings that have been selected*. However, because interdependent details have been specified for the entire configuration, additional functionality can be turned on later. The additional functionality are turned on by using the Oracle Fusion Applications Functional Setup Manager to start the other Managed Servers. Click **Details** in the message pane to see a breakdown of servers for each offering. After clicking **Next**, selections cannot be changed on this screen. To make changes, click **Cancel**, open a new wizard session, and create a new response file Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Response File Description	Enter information to describe this response file. This description is not associated in any way with the executable plan file, or the summary file, that has been saved at the end of the response file creation process. • **Response File Name**: Specify a name to identify this response file. • **Response File Version**: Assign a version number to this response file. The version is intended for documentation only. • **Created By**: Defaults to the operating system user who invoked the wizard. Set when the response file is initially created and cannot be modified for the current response file. • **Created Date**: Defaults to the date that the response file was initially created and saved. Set when the response file was initially created and cannot be modified for the current response file. • **Response File Description**: Provide a description of this response file. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Installation Location	Specify credentials for the Node Manager and supply the location of the various directories required for installation and configuration actions. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
System Port Allocation	Accept the default values or set a custom value for the **Applications Base Port**. The application domain port ranges are derived from this value. If the base port value is changed, the domain port ranges adjust accordingly. Ranges must not overlap and must be set in ascending order. Ports listed under **Other Ports** are not derived from the **Applications Base Port** value. These individual ports can be defined using custom port values. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Database Configuration	Enter the database parameters established when the Oracle Database was installed. The wizard validates whether the installed database is a single-instance or Oracle Real Application Clusters (Oracle RAC). If a **Single Instance Database**, enter: • **User Name (SYSDBA Role)**: The user name of the `sysdba` role. This user name is used to upgrade schemas during the configuration phase. Note that the `sysdba` fields are not validated. Thus, ensure that the correct values are entered. • **Password**: The password of the `sysdba` role. • **Host Name**: The name of the host where the database is installed. • **Port**: The listening port for the database. • **Default Application Service Name:** The global database name for the database that is installed. This service name is used to distinguish this database instance from other instances of Oracle Database running on the same host. • **Batch Application Service Name:** The database service name for the instance of Oracle Fusion Applications database to be used for all back jobs, BI, Essbase, and SOAP services. • **XA Application Service Name:** The database service name for the instance of Oracle Fusion Applications database to be used for all XA transactions, supporting the two-phase commit protocol. If Oracle RAC has been installed using Multi Data Sources, select **Multi Data Sources Real Application Clusters Database** and enter the following values: • **User Name (SYSDBA Role)**: The user name of the `sysdba` role. This user name is used to upgrade schemas during the configuration phase. Note that the `sysdba` fields are not validated. Thus, ensure that the correct values are entered.. • **Password**: The password of the `sysdba` role. • **Service Name**: The global database name for the database that is installed. • **Host Name**: The name of the host for each Oracle RAC instance. • **Port**: The listening port of the database. • **Instance Name**: The name of the Oracle RAC instance used to manage this database. Due to a limitation in the Oracle Data Integrator (ODI) installer, if Real Application Clusters Database is selected, at least two rows must be entered in the table. See Install Phase Failed with INST-07221: Specified connect string is not in a valid format Error (page 14-13). Click **Add** to create a new row in the table for each instance. Select a row and click **Remove** to delete it.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
	Tip: This value is available in the *Oracle Fusion Applications Installation Workbook* , **Database** tab, **FA Transactional Database** table. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Schema Passwords	The database that is installed contains preloaded schemas required for runtime execution. Select one of the following options and enter the database schema passwords set up when the Oracle Fusion Applications Repository Creation Utility was run. See Run the Oracle Fusion Applications Repository Creation Utility (page 8-27). • **Use the same password for all accounts**: Select this option a single password is setup for all accounts. Enter the value in the **Password** field. This option is the default.. • **Use a different password for each account**: Select this option if individual passwords are setup for each **Account**. Password values were set up for Fusion Applications and AS Common Schemas. Enter those values in the **Password** field. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
ODI Password Configuration	Enter and confirm the ODI supervisor password. The ODI Supervisor Password is the Supervisor Password entered on the **Custom Variables** page during execution of Applications RCU under the Primary and Work Repository component. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Domain Topology Configuration	To determine the flow for the remaining wizard interview screens, choose one of the options. The types of possible topologies are: • **Basic Topology**: One host for all domains • **Medium Topology**: One host per domain • **Advanced Topology**: One host per application and middleware component Note that all hosts must use the same operating system. For example, *domain1* cannot be installed on Windows and *domain2* on Linux. Note that any of the Oracle Identity Management hosts cannot be used as the host in the Domain Topology Configuration. Installing Oracle Identity Management and Oracle Fusion Applications on the same host is not a supported topology. See Domain Topology Configuration (page 12-17). To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Common Domain	**Note**: Individual domain screens appear only if the **One host per application and middleware component** option is selected on the **Domain Topology Configuration** screen. Specify values for this domain and its middleware dependencies. All hosts must use the same operating system and share a common mount point for network storage. The host specified for the Admin Server is the default for all servers. The default host can be changed. • **Host Name**: Specify the host where the Managed Servers for this domain is installed and configured. Note that this host cannot be the same Oracle Identity Management host. • **Port**: Port for internal communications only. The wizard assigns values based on values on the **System Port Allocation** screen. Port values can be edited. However, these values must be unique within the domain and fall within the range previously specified. For example, in a range of 7401 to 7800, a value of 8444 generates an error. • **UCM Intradoc Server Port**: Port where the Universal Content Management Server listens. • **InBound Refinery Server Port**: Used for calling top-level services. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Product Family Domains	**Note**: Individual domain screens appear based on which options are selected on the **Domain Topology Configuration** screen. For example, the **Incentive Compensation Domain** screen does not appear unless that product offering is selected for installation. All product family domain screens prompt for the same types of values. Specify values for this domain and its middleware dependencies. All hosts must use the same operating system and share a common mount point for network storage. The host specified for the Admin Server is the default for all servers. The default host can be changed. • **Host Name**: Specify the host where the Managed Servers for this domain is installed and configured. Note that this host cannot be the same Oracle Identity Management host. • **Port**: Port for internal communications only. The wizard assigns values based on values on the **System Port Allocation** screen. Port values can be edited. However, these values must be unique within the domain and fall within the range previously specified. For example, in a range of 7401 to 7800, a value of 8444 generates an error. **Note**: See Oracle Business Intelligence Configuration (page 12-19) for Oracle Business Intelligence configuration requirements. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Web Tier Configuration	Use this screen to configure Oracle HTTP Server and choose a virtual host type. The web tier can be deployed to a host inside the firewall, or outside the firewall (demilitarized zone, known as DMZ). See Web Tier Configuration (page 12-20) for the list of parameters. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Virtual Hosts Configuration	Provisioning determines the application domains to be deployed based on the product offering choices and lists them on this screen. Specify domain-specific values for the type of virtual host mode that are selected on the **Web Tier Configuration** screen. See Virtual Hosts Configuration (page 12-23) for the list of parameters. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Load Balancer Configuration	Load balancing enables the distribution of a workload evenly across two or more hosts, network links, CPUs, hard drives, or other resources. Check **Enable Load Balancing** to take advantage of this feature, and specify: • **Internal Load Balancer Configuration**: The host and port for the internal Virtual IP (VIP). • **External Load Balancer Configuration**: The host and port for external Virtual IP (VIP). It must have a publicly available address to be usable. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Web Proxy Configuration	Create **Proxy Settings** to enable users who want to use a proxy server to connect to the Internet. See Web Proxy Configuration (page 12-24). Take note of the special instructions for Oracle Customer Relationship Management customers. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
IDM Properties File	When a response file is created or an incomplete response file is updated without updates to this page, the IDM properties file can be selected to load IDM configuration data. After the file is selected, the content can be reviewed and a decision to proceed with this file can be made. **WARNING:** The file can be reviewed and a different file can be selected, if it is required on this screen. An IDM properties file cannot be selected after clicking **Next**, as the screen displays read-only fields. **Disable loading IDM Configuration from IDM Properties file:** Select this option to avoid loading the IDM configuration data from the IDM properties file. **Load IDM Configuration from IDM Properties file**: Select this option to set the values on the **Identity Management Configuration** screen and the **Access and Policy Management Configuration** screen to the default values in the IDM properties file (for example, `idmsetup.properties`). **IDM Properties file**: Enter the location of the file, for example, *`SHARED_CONFIG_DIR`*`/fa/idmsetup.properties`, where *`SHARED_CONFIG_DIR`* is the shared configuration location that was selected in the **Install Location Configuration** page of the Oracle Identity Management Provisioning Wizard. **IDM Properties file contents**: If a valid IDM properties file is selected, the contents are displayed. This field is read-only and cannot be modified. Click **Next** to continue.

Table 12-2 (Cont.) Creating a Response File

Screen	Description and Action Required
Identity Management Configuration	Provisioning loads the roles, policies, and application IDs that are created during the prerequisite Oracle Identity Management installation. To share the identity management environment across multiple Oracle Fusion Applications installations, and make the policies and roles accessible to all environments, populate identity management configuration details during the first installation. See Identity Management Configuration (page 12-26) for the list of parameters. See also Distinguished Names (page 12-25) for information about Distinguished Names conventions. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Access and Policy Management Configuration	Configure Oracle Fusion Applications for integration with existing Oracle Access Manager components. See Access and Policy Management Configuration (page 12-28) for the list of parameters. To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.
Summary	Displays the applications and middleware components that are installed when a physical installation is performed using this response file. Includes details such as required disk space and the installation locations. See Summary (page 12-31) for a description of the parameters. Click **Finish** to save the response file. The response file is complete and can be used as the basis for provisioning of a new environment.

12.3.3 Oracle WebLogic Server Node Manager Credentials and Installation Locations

Specify credentials for the Node Manager and supply the location of the various directories required for installation and configuration actions on the **Installation Location** screen. The credentials provided are used to configure the NodeManager, secure WebLogic Server and OWSM keystores and wallets on the file system.

Ensure to use the specified user name and password to connect to the NodeManager for starting and stopping servers.

Node Manager Credentials

- **User Name**: Specify a user name for the Node Manager role.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **Identity Store / Policy Store** table, **FA Node Manager Username** row.

- **Password**: Specify a password for the Node Manager and retype it in the **Confirm Password** field.

Installation and Configuration

Provide locations of various directories that the administrator needs access to. Enter the full file path in the Provisioning Wizard UI when asked to provide any file path, such as Oracle Fusion Applications Home, Applications Configuration Directory, and so on. Using symbolic link paths causes provisioning to fail in later phases.

- **Installers Directory Location**: Enter the path to the *repository_location* directory where the Oracle Fusion Applications software is extracted. This software is obtained from the media pack downloaded from the Oracle Software Delivery Cloud Portal.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Temporary Shared Storage** table, **Installers Directory Location** row.

- **Applications Base**: Enter the directory path to the applications base directory. The top-level directory for the Oracle Fusion Applications binaries is the applications base and is referred to as the *APPLICATIONS_BASE* directory (`net/mount1/appbase`). See Oracle Fusion Applications Oracle Home Directory (page 2-34).

  The applications base directory must not be set to the system root directory or set to the root directory of a logical drive. Some lifecycle management tools compute directory names by backing up one directory level from the applications base directory and then appending the appropriate subdirectory name. These tools fail if the applications base directory is set to the system root directory or set to the root directory of a logical drive because it is not possible to back up one directory level from the system root directory or from the root directory of a logical drive.

  During creation of a provisioning plan in a UNIX environment, ensure that the absolute file path of the *APPLICATIONS_BASE* directory does not exceed 59 characters before provisioning a new application environment.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **FA Applications Base** row.

- **Applications Configuration**: This directory is automatically populated based on the value specified in the **Applications Base** field. It is the path to the directory where the configuration files for the domain are written. It is possible to specify a different location instead of using the location automatically populated by the UI. This directory must be empty.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **FA Applications Configuration Location** row.

- **Enable Local Applications Configuration**: Select this checkbox to run the Managed Servers from a non-networked (local) disk on the host, visible only to the processes running on that host. If this option is enabled, the wizard copies the domain configuration from the shared location and places it on the specified local disk. This configures all Managed Servers to run from the non-networked location.
- **Local Applications Configuration**: Specify the location for the local domain directory to be set up. This field is required if the option **Enable Local Applications Configuration** is selcted. The specified directory must exist and initially be empty on every host that participates in the domain topology. Ensure the directory has sufficient disk space. During the Preverify phase, provisioning displays an error if the local configuration directory does not have sufficient disk space.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Storage** tab, **Install Directories** table, **FA Local Applications Configuration Location** row.

Middleware Dependencies

- **Font Directory**: Appears only if Oracle Sales, Oracle Marketing, or Oracle Financials offerings are selected. Enter the directory where the TrueType fonts are installed. The location varies on different operating systems, but is typically found here:
  - **Linux x86-64**: `/usr/X11R6/lib/X11/fonts/TTF`
  - **Oracle Solaris**: `/usr/X11R6/lib/X11/fonts/TrueType`

  Some systems may not have TrueType fonts installed. If the fonts cannot be located on the system, verify that they have been installed. In addition, use the fonts directory shipped as part of the JRE installed in the repository. Regardless of which path is specified, access to.ttf files.

Oracle Business Intelligence Repository Password

RPD Password: Specify and **Confirm** a password to allow access to the metadata repository (RPD) for both Oracle Business Intelligence Applications and Oracle Transactional Business Intelligence. The password must be between 8 and 30 characters and contain at least one digit. It can include letters, numbers, pound sign (#), dollar sign ($), or underscore (_). Toinclude two consecutive dollar signs ($$) in the

RPD password, enter one additional dollar sign ($) as the escape character before the second dollar sign in the password. This means it is necessary to enter three dollar signs ($$$) for this field in the Provisioning Wizard to indicate two consecutive dollar signs. Provisioning sets up this password, but does *not* actually access the repository.

12.3.4 System Port Allocation

Accept the default values or set a custom value for the **Applications Base Port**. The application domain port ranges are derived from this value. If the base port value is changed, the domain port ranges adjust accordingly. Ranges must not overlap and must be set in ascending order.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Fusion Applications Port Numbers** table, **Fusion Applications Base** row.

Ports listed under **Other Ports** are not derived from the Applications Base Port value. These individual ports can be defined using custom port values.

> **Tip:**
>
> Node Manager: This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Fusion Applications Port Numbers** table, **FA Node Manager** row.

To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment. Click **Next** to continue.

If there are other software running on the provisioning hosts, ensure that the system port allocation value in the provisioning response file is not a port already used by other software. The system port allocation cannot be changed after starting provisioning a new Oracle Fusion Applications environment. If a port conflict is detected during provisioning phases, restart provisioning from the beginning with a correct set of system port allocation. See Installation Phases and Types of Hosts in a Multiple-Host Environment (page 13-2).

To display a list of network connections including the port numbers and process identifier holding the ports, run these commands:

UNIX: `netstat -anp`

12.3.5 Domain Topology Configuration

To determine the flow for the remaining wizard interview screens, choose one of the topology types. Note that all occurrences of a `hostname` should use the same name in the response file. A machine name could be a logical or virtual host name. It can either

be in fully qualified form, `mymachine.mycompany.com`, or short form, `myMachine`, if it is consistent throughout the response file. See Edit Host Names (UNIX) (page 5-13).

The types of possible topologies are:

- **Basic Topology**: One host for all domains
- **Medium Topology**: One host per domain
- **Advanced Topology**: One host per application and middleware component

MANDATORY: Install Oracle Identity Management and Oracle Fusion Applications on different hosts. Installing Oracle Identity Management and Oracle Fusion Applications on the same host is not a supported topology.

- **One host for all domains**: Select this option to specify the **Host Name** to provision all applications domains and their middleware dependencies on a single host. The wizard continues the interview at the **Web Tier Configuration** screen after clicking **Next**.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Environment Info** table, **FA Topology Type** row :
  >
  > For Basic topology, **Select One Host For All Domains**.
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Component Assignment** table:
  >
  > All Components below must have the same node number in the *Oracle Fusion Applications Installation Workbook*, use the abstract hostname (or real hostname if absract is blank) that corresponds to that node # in the Topology table:
  >
  > – FA Common Domain
  > – FA CRM Domain
  > – FA Financials Domain
  > – FA HCM Domain
  > – FA IC Domain
  > – FA Procurement Domain
  > – FA Projects Domain
  > – FA Supply Chain Domain
  > – FA Business Intelligence Domain

- **One host per domain**: Select this option and then select a **Host Name** for each domain to be created. Provisioning installs and configures the Managed Servers for each **Application Domain** and the middleware dependencies on the host that is specified. The wizard continues the interview at the **Web Tier Configuration** screen after clicking **Next**.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Environment Info** table, **FA Topology Type** row:
>
> For Enterprise topology, select **One Host Per Domain**.
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Component Assignment** table:
>
> Use the abstract hostname (or real hostname if abstract is blank) that corresponds to the node # for the following components in the Topology table:
>
> – FA Common Domain
> – FA CRM Domain
> – FA Financials Domain
> – FA HCM Domain
> – FA IC Domain
> – FA Procurement Domain
> – FA Projects Domain
> – FA Supply Chain Domain
> – FA Business Intelligence Domain

- **One host per application and middleware component**: Select this option to specify the host for each application and middleware component individually. The wizard displays the **Common Domain** screen after clicking **Next**, and includes all domain-specific screens in the interview.

  This topology is not covered in the *Oracle Fusion Applications Installation Workbook* by default, but it possible to use it as part of an Enterprise or Enterprise HA example topology.

If the last option is selected, the selections cannot be changed on this screen after clicking **Next**. Click **Cancel**, open a new wizard session, and create a new response file to change the configuration domain topology later.

12.3.6 Oracle Business Intelligence Configuration

Oracle Business Intelligence products are integrated with, and accessible from, Oracle Fusion Applications. Products include:

- Oracle Business Intelligence Enterprise Edition
- Oracle Business Intelligence Applications
- Oracle Transactional Business Intelligence
- Oracle Essbase
- Oracle Business Intelligence Publisher
- Oracle Real-Time Decisions

Enter the **Host** where the Oracle Business Intelligence products are installed. An **RPD** password is specified on the **Installation Location** screen. Provisioning creates this password and makes it available so that Oracle Business Intelligence Applications and Oracle Transactional Business Intelligence can access the metadata repository in the new environment.

The Oracle Fusion Applications installation and provisioning process installs the Oracle BI Applications software components in the Business Intelligence Oracle home but does no further setup. To finish setting up Oracle BI Applications, follow the instructions in the Installing and Setting Up Oracle BI Applications in the *Oracle Business Intelligence Applications Installation Guide*.

12.3.7 Web Tier Configuration

Virtual hosts can be created on a single web tier. There are three options (IP-based, name-based, and port-based) for each domain that is created during installation. The values assigned during installation are derived from the default HTTP port specified on this screen. Note that all occurrences of a hostname should use the same name in the response file. A machine name could be a logical or virtual host name. It can either be in fully qualified form, `mymachine.mycompany.com`, or short form, `myMachine`, if it is consistent throughout the response file. See Edit Host Names (UNIX) (page 5-13).

Web Tier

Install Web Tier in DMZ: Select this option if a separate host is setup for web tier installation as a demilitarized zone (DMZ). This host does not have access to the shared file system. It cannot be used for any other host deployed, regardless of domain. See Setting Up a Demilitarized Zone (DMZ) for the Web Tier (page 6-9).

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab: Verify if the **DMZ (Yes/No)** column has the value **Yes** for the node that corresponds to the component FA WebTier.

Fusion Applications Web Tier

- **Host**: Enter the name of the host where Oracle HTTP Server is installed and configured.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab: Use the **Abstract Host Name** column (or real hostname if abstract is blank) for the node that corresponds to the component FA WebTier.

- **Virtual Host Mode**: Select one of the following:
  - **IP Based**: Created on the basis of an IP or IP:host combination (the default).
  - **Name Based**: Create new DNS entries, such as `fin.example.com` and `crm.example.com` to use as virtual hosts.

  - **Port Based**: Created based on the internal and external port for each domain.

WARNING: In the Provisioning Wizard, do not choose the Name Based virtual host mode if it has been planned to specify Load Balancer Configuration details on the next page. This combination is not recommended as it requires manual changes during Oracle Fusion Applications Provisioning. Setting up Name Based virtual hosts is not recommended if a Load Balancer is used.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **WebTier Virtual Host Mode** table, **FA WebTier** row, **Mode** column.

- **Domain Name**: Specify a domain name (using the format *my.example.com*) to configure the domain in which Oracle Fusion Applications receives requests. This value is also used as the default domain name for name-based virtual hosts.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Environment Info** table, **Domain name** row.

- **HTTP Port**: The default port for the web tier. UNIX: Do not specify a port that requires operating system administrator privileges.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Fusion Applications Port Numbers** table, **FA Oracle HTTP Server** row.

- **HTTPS (SSL) Port**: Secure port for the web tier. UNIX: Do not specify a port that requires operating system administrator privileges.

  WARNING: On UNIX platforms, using a port below 1024 requires root privileges and Provisioning is not run as root user, so a HTTP/HTTPS port below 1024 should not be specified.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Fusion Applications Port Numbers** table, **FA Oracle HTTP Server SSL** row.

CRM Marketing Web Tier

If the **Oracle Fusion Customer Relationship Management** offering is selected in the **Provisioning Configurations** Screen, the **CRM Marketing Web Tier** group with the following fields is displayed:

- **Host**: Enter the name of the host where the Oracle HTTP Server dedicated for CRM Marketing web tier is installed and configured.
- **Virtual Host Mode**: Select one of the following:
  - **IP Based**: Created on the basis of an IP or IP:host combination.
  - **Name Based**: Create new DNS entries, such as `fin.example.com` and `crm.example.com` to use as virtual hosts.
  - **Port Based**: Created based on the internal and external port for each domain.

  The default is to create an IP-based host.
- **Domain Name**: Specify a domain name (using the format my.example.com) to configure the domain in which Oracle Fusion Applications receives requests. This value is also used as the default domain name for name-based virtual hosts.
- **HTTP Port**: The default port for the web tier. It should not require operating system administrator privileges.
- **HTTPS (SSL) Port**: Secure port for the web tier. It should not require operating system administrator privileges.

SMTP Server

- **Host**: Specify the host for email marketing. This field appears only if the Oracle Fusion Customer Relationship Management offering.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Email Server** table, **SMTP Server Host** row.

- **Port**: Default port for the SMTP server.

12.3.8 Load Balancer Configuration

Load balancing enables to distribute a workload evenly across two or more hosts, network links, CPUs, hard drives, or other resources.

Load Balancing Enabled: This checkbox is selected by default. Keep it checked if load balancer is used in front of the Oracle Fusion Applications environment. Ensure that the load balancer configuration is completed as described in Planning Load Balancer Requirements (page 4-3) before proceeding and then specify the following:

- **Internal Load Balancer Configuration**: The host and port for the internal Virtual IP (VIP).

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table.

- **External Load Balancer Configuration**: The host and port for external Virtual IP (VIP). It must have a publicly available address to be usable.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table.

To stop creating this response file and resume later, click **Save**. This action creates a partial response file. A partial response file cannot be used to provision an environment.

Click **Next** to continue.

12.3.8.1 Virtual Hosts Configuration

Specify the configuration parameters for the domains to be installed on the virtual hosts that are selected on the Web Tier Configuration page. Note that all occurrences of a `hostname` should use the same name in the response file. A machine name could be a logical or virtual host name. It can either be in fully qualified form, `mymachine.mycompany.com`, or short form, `myMachine`, if it is consistent throughout the response file.

If the **Oracle Fusion Customer Relationship Management** offering is selected in the **Provisioning Configurations** Screen, the corresponding section **IP-Based Virtual Host for CRM Marketing** with the following fields are displayed:

- **Application Domain**: The name of the Oracle Fusion Applications domain to be provisioned.
- **External Name**: The host name or IP address for the external virtual host for this domain or middleware dependency. The host:port should be visible from outside the firewall.
- **External Port**: Port to be used for this external virtual host. The host:port should be visible from outside the firewall.

If the **IP Based** option is selected, specify the following information for each application domain listed:

> **Tip:**
>
> These values are available in the *Oracle Fusion Applications Installation Workbook*, **Network - Virtual Hosts** tab, **FA WebTier Virtual Hosts** table.

- **Internal Name**: The host name where the web tier listens on the internal virtual host for this domain. The host name can consist of letters A through Z (upper or

lower case), digits 0 through 9, minus sign (-) and period (.). The first character must be a letter and the last character must not be a minus sign or a period.

- **Internal Port**: The port for this internal virtual host. Visible only from inside the firewall.
- **External Name**: The host name for the external virtual host for this domain or middleware dependency. The host name can consist of letters A through Z (upper or lower case), digits 0 through 9, minus sign (-) and period (.). The first character must be a letter and the last character must not be a minus sign or a period. The host:port should be visible from outside the firewall.
- **External Port**: The port to be used for this external virtual host. The `host:port` should be visible from outside the firewall.

If the **Name Based** option is selected, specify the following information for each domain listed:

- **Internal.Name**: The DNS name for this internal virtual host. For example, for Oracle Fusion Financials, the name might be `fin-internal`.
- **External.Name**: The DNS name for this external virtual host. For example, for Oracle Fusion Financials, the name might be `fin`.

If the **Port Based** option is selected, specify the following information for each domain listed:

- **Internal Port**: The port that is visible only from inside the firewall for this domain.
- **External Port**: The port that is visible from outside the firewall for this domain.

12.3.9 Web Proxy Configuration

Create **Proxy Settings** to enable users who want to use a proxy server to connect to the Internet.

> **Tip:**
>
> These values are available in the *Oracle Fusion Applications Installation Workbook*, **Environment** tab, **Web Proxy** table.

- **Enable Web Proxy**: Select to enable proxy-related values to set up access to the Internet. **Note**: For CRM customers, who have a web proxy for external HTTP(S) traffic, select **Enable Web Proxy** on this screen and specify the web proxy configuration.
- **Web Proxy Host**: Enter the name of the host where the proxy server is installed.
- **Web Proxy Port**: The listening port assigned to the proxy server.
- **Enable Secure Web Proxy**: Select to have the proxy server SSL-enabled. If this check box is selected, the **Secure Web Proxy Host** and **Secure Web Proxy Port** fields are enabled and become mandatory.
- **Secure Web Proxy Host**: Enter the SSL host used for secure communications.
- **Secure Web Proxy Port**: Enter the SSL port used for internal communications.

- **No Proxy Hosts**: Defaults to hosts that are connected directly. If there are multiple hosts, they are listed and separated by a vertical bar (|). A wildcard character (*) can be used to specify hosts that should be bypassed. For example,, `*.example.com` would bypass all hosts whose name ends with `.example.com`. The `localhost` value cannot be entered.
- **Proxy Server Requires Authentication**: To enable authentication for the proxy server, select this option.
- **User Name**: Enter the user name that is set up for accessing the proxy server.
- **Password**: Enter the password that is set up for accessing the proxy server.

12.3.10 Distinguished Names

A Distinguished Name (DN) identifies an entry in a Lightweight Directory Access Protocol (LDAP) directory. Because directories are hierarchical, DNs identify the entry by its location as a path in a hierarchical tree (much as a path in a file system identifies a file). Generally, a DN begins with a specific common name, and proceeds with increasingly broader areas of identification until the country name is specified.

Table 12-3 (page 12-25) provides definitions for distinguished name components (defined in the X.520 standard).

Table 12-3 Distinguished Name Components

Component	Definition
Common Name (CN)	Identifies the person or object defined by the entry. For example, `cn=John Doe`. Or `cn=corpDirectory.example.com`.
Organizational Unit (OU)	Identifies a unit within the organization. For example, `ou=scm`.
Organization (O)	Identifies the organization where the entry resides. For example, `o=My Corporation`.
Locality (L)	Identities the place where the entry resides. The locality can be a city, county, township, or any other geographic region. For example, `l=City`.
State of Province Name (ST)	Identifies the state or province in which the entry resides. For example, `st=State`.
Country (C)	Identifies the name of the country where the entry resides. For example, `c=US`
Domain Component (DC)	Identifies the components of a domain. For example, if the domain is `example.com`, the domain components would be: `dc=example, dc=com`.

12.3.11 Oracle Identity Management Properties File

When a response file is created or an incomplete response file is updated without updates to this page, it is possible to select the IDM properties file to load Oracle Identity Management configuration data. After selecting the file, review the content and decide if proceeding or not with this file.

WARNING: Review the file and select a different file if required on this screen. An IDM properties file cannot be selected after clicking **Next**, as the screen displays read-only fields.

- **Do not load IDM Configuration from IDM Properties file**: Select this option to avoid loading the IDM configuration data from the IDM properties file.
- **Load IDM Configuration from IDM Properties file:** Select this option to default the values on the Identity Management Configuration screen and the Access and Policy Management Configuration screen to the values in the IDM properties file (for example, `idmsetup.properties`). For more information about the IDM properties file, see Pass Configuration Properties File to Oracle Fusion Applications (page 10-23).
- **IDM Properties file:** Enter the location of the file, for example, *`SHARED_CONFIG_DIR`*`/fa/idmsetup.properties`, where *`SHARED_CONFIG_DIR`* is the shared configuration location selected on the **Install Location Configuration** page of the Oracle Identity Management Provisioning Wizard.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **IDM Provisioning Files** tables, **IDM Properties File Location** row.

- **IDM Properties file contents:** If a valid IDM properties file is selected, the contents are displayed. This field is read-only and cannot be modified.

12.3.12 Identity Management Configuration

Enter the parameters necessary to integrate applications with a previously installed Oracle Identity Management infrastructure. If the values in the IDM properties file (for example, idmsetup.properties) are chosen on the **IDM Properties File** screen to be used, they appear as defaults in the corresponding fields. The default values can be changed if the original configuration has changed.

- **Super User Name**: By default this field contains the value `FAAdmin`. Enter the name of an existing user that should be granted administrator and functional setup privileges. The `uid` attribute must be set to be the same as the `cn` attribute.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **Identity Store / Policy Store** table, **FA Super User Name** row.

- **Create Administrators Group**: Indicate whether an *Administrators* group was created, whose members have specialized privileges for all Oracle Fusion Middleware components. If this group is not already present in the identity store, this box should be checked.
- **Create Monitors Group**: Indicate whether a *Monitors* group was created, whose members have read-only administrative privileges to Oracle WebLogic Server domains. If this group is not already present in the identity store, this box should be checked.

- **Create Operators Group**: Indicate whether an *Operators* group was created, whose members have Monitors privileges to Oracle WebLogic Server domains. If this group is not already present in the identity store, this box should be checked.
- **Identity Store Server Type**: Indicate the type of identity store that was set up during Oracle Identity Management provisioning. The available options are OID (Oracle Internet Directory) or OVD (Oracle Virtual Directory). If OVD is selected, the **Default to Identity Store** check box in Oracle Platform Security Services Configuration must be unchecked and the policy store cannot be the same instance as the identity store. Using OVD for policy store is not currently supported.

  > **Tip:**
  >
  > This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **Identity Store / Policy Store** table, **ID Store Type** row.

- **Use SSL to Communicate With Identity Store**: This feature is not enabled in this release.
- **Identity Store Host**: Enter the host or DNS name for the identity store LDAP service. This can be the host name of the identity server or the host name for the load balancer endpoint load balancing multiple identity servers.
- **Identity Store Port**: The port assigned to the identity store. This can be the port of the identity server or the port for the load balancer endpoint load balancing multiple identity servers.

  > **Tip:**
  >
  > The value for the Identity Store Port is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table.

- **Identity Store Secure Port**: The SSL port assigned to the identity store. This feature is not enabled for this release. This can be the secure port of the identity server or the secure port for the load balancer endpoint load balancing multiple identity servers.
- **Identity Store User DN**: Enter the Distinguished Name of the user that is set up with read-write access to the LDAP.
- **Identity Store Password**: Enter the password that is set up for the user with read-write access to the LDAP.
- **Identity Store Read-only User DN**: Enter the Distinguished Name (DN) of the user that is set up with read-only access to the Identity Store LDAP.
- **Identity Store Read-only Password**: Enter the password that is set up for the identity store read-only user.
- **Identity Store User Name Attribute**: Choose the type of user name attribute that is configured in the identity store. Valid values are: user ID (uid), common name (CN), or email address.

- **Identity Store User Login Attribute**: Enter the name of the attribute that needs to match for the user to be authenticated.
- **Identity Store User DN Attribute**: Enter the attribute that defines the Distinguished Name (DN) of the user.
- **Identity Store Object Classes For User Creation**: Enter the object classes to be assigned to a new user created in identity store, in a comma-separated list of user object class names.
- **Identity Store Object Classes For Group Creation**: Enter the object classes to be assigned to a new group created in identity store, in a comma-separated list of group object class names.
- **Identity Store User Base DN**: Enter the root Distinguished Name assigned to the upload of applications user data. This is the root for all the user data in the identity store.
- **Identity Store Group Base DN**: Enter the root Distinguished Name for all the group data in the identity store.
- **IDM Weblogic Admin Username**: Enter the Weblogic administrator user name for the IDM Weblogic domain. Accept the default value if the IDM was created using the IDM provisioning.
- **IDM Weblogic Admin Password**: Enter the password for the Weblogic administrator user in the IDM Weblogic domain.

The wizard warns if it cannot connect to the database. If this warning represents an exception, ignore it and continue creating the response file. However, all issues *must* be fixed before starting to provision an environment. Provisioning cannot be run successfully until all validation have passed.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*:
>
> For Basic topology: **Topology** tab, **Topology** table, **Abstract Host Name** column (or real if abstract is blank) for node corresponding to the IDM Identity and Access component. For Enterprise/Enterprise HA: **Network - Virtual Hosts** tab, **HTTP LBR Endpoints** table, **IDM** row.

12.3.13 Access and Policy Management Configuration

Enter the parameters necessary to integrate applications with a previously installed Oracle Identity Management infrastructure. If the values in the IDM properties file (for example, `idmsetup.properties`) are chosen on the **IDM Properties File** screen to be used, they appear as defaults in the corresponding fields. Replace the defaults if the original configuration has changed.

Oracle Access Manager Configuration

- **OAM Admin Server Host:** Enter the name of the host where the Administration Server for Oracle Access Manager exists.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*:
>
> For Basic topology: **Topology** tab, **Topology** table, **Abstract Host Name** column (or real if abstract is blank) for node corresponding to the IDM Identity and Access component. For Enterprise/Enterprise HA: **Network -Virtual Hosts** tab, **AdminServer Virtual Hosts/VIPs** table, **IDMDomain AdminServer** row.

- **OAM Admin Server Port:** Enter the port number for the Oracle Access Manager Administration Server.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain AdminServer** row.

- **OAM Administrator User Name**: Enter the name assigned to this user when Oracle Access Manager was installed.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **OAM** table, **OAM Administrator User Name** row.

- **OAM Administrator Password**: Enter the password assigned to this user when Oracle Access Manager was installed.
- **OAM HTTP Internal Endpoint URL**: The internal access point on the Oracle HTTP Server for Oracle Access Manager.
- **OAM HTTP(S) External Endpoint URL**: The access point to use for accessing the Oracle Access Manager application using a browser.
- **OAM AAA Server Host:** Enter the name of the proxy host where the Oracle Access Manager is installed.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Topology** tab, **Topology** table, **Abstract Host Name** (or Real if abstract is blank) for node corresponding to the IDM Identity and Access component.

- **OAM AAA Server Port:** The port number for the Oracle Access Manager listener on the OAM proxy host.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain OAM AAA Server Port** row.

- **Access Server Identifier:** Name used to identify the Oracle Access Server.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **OAM** table, **Access Server Identifier** row.

- **Enable Second Primary Oracle Access Manager**: Select this checkbox to name a second Primary Oracle Access Manager for high availability.
- **Second Access Server Identifier**: This defaults to `aaa2`, the name of the second Primary Oracle Access Manager Server.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **OAM** table, **Second Access Server Identifier** row.

- **Webgate Password**: Specify a password for the Resource WebGate. It must contain at least eight alphanumeric characters and at least one digit or punctuation mark. Retype to **Confirm** the password. If seeding of security data is disabled, the password must be the existing WebGate password.

Oracle Platform Security Services Configuration

- **OPSS Policy Store JPS Root Node**: This is the Distinguished Name of the node to be used as the OPSS policy root for Oracle Fusion Applications. This field is read-only and the default value is set as cn=FAPolicies.

> **Tip:**
>
> This value is available in the *Oracle Fusion Applications Installation Workbook*, **Identity Management** tab, **LDAP** table, **FA JPS Root DN** row.

Identity Management Keystore Configuration

The IDM Keystore file and password value fields are enabled if either the Identity Store, the OPSS Store, or the OIM endpoint is SSL-enabled. These fields are populated by the values from the IDM properties file (`for example,idmsetup.properties`), if the file that contains these values exists. Edit these values if the fields are enabled.

- **IDM Keystore File**: Enter the location of the JKS keystore containing the certificates for the Oracle Identity Management components.
- **IDM Keystore Password**: Enter the password that is set up for the IDM Keystore File.

Note: The wizard warns if it cannot connect to the database. If this warning represents an exception, ignore it and continue creating the response file. However, all issues *must* be fixed before starting to provision an environment. Provisioning cannot be run successfully until all validation have passed.

12.3.14 Summary

Verify that the installation represented on this screen is correct. Click **Back** to return to the interview screens that require changes. Complete the following information:

- **Response File Name**: Specify a unique file name for this response file. This is the executable file that is supplied to the wizard when prompted for other options.
- **Provisioning Summary**: Specify a unique name for the summary details file. This file cannot be used to execute the response file.
- **Directory**: Enter the directory path where this response file and the summary file will be saved. Choose a location that is visible to all servers accessing shared storage. Make sure the location is not read-only.

Record the name of the response file and its location. Supply it to the system administrator to use when performing system maintenance tasks.

12.4 Update an Existing Response File

During the response file creation process, it is possible to create a **partial response file**, which contains an incomplete set of configuration details. To create a partial response file, click **Save** at any point during the interview. To continue with the creation of the response file, start the wizard and select **Update an Existing Response File** from the **Installation Options** screen. Page through the screens and continue where it was left off.

Clicking **Cancel** is another way to create a partial response file, or, alternatively, exit the wizard without saving any response file details:

1. Start the Provisioning Wizard and choose **Create a New Applications Environment Response File** from the **Installation Options** screen.
2. Begin the interview process and continue to the point to end the session. Click **Cancel**.
3. Choose one of the following options:
   - **Save and Exit**: Save the details created for this response file. Creates a partial response file.
   - **Exit**: Exits the wizard without saving any details. Does not create a partial response file.
   - **Cancel**: Does not exit the wizard and stays in the current page. Continue with the interview by returning to the **Welcome** screen in the wizard interview. Does not save the details entered and does not create a partial response file.

4. Choose **Save and Exit**. The partial response file is saved in the directory where the wizard is started.
5. To add more details to the response file, start the Provisioning Wizard and choose **Update an Existing Response File**. Specify the **Response File** location, or click **Browse** to navigate to the partial response file.
6. Page through the interview screens until coming to the point where the last session was stopped and move through the rest of the interview as described in Table 12-2 (page 12-5) until the process is finished.

Save a partial response file and return to the wizard as many times as necessary to complete it. The wizard does not recognize a response file as being complete or valid until clicking **Finish** on the **Summary** screen.

Update also a completed response file if it has not been implemented. Note that after selecting product offerings for a partial or completed response file, the mix cannot be changed by updating the response file. Start a new wizard session and create a new response file.

12.5 Next Steps

After saving the response file, return to the **Installation Options** screen and select the **Provision an Applications Environment** option to perform the physical installation. Or, create another response file to use for another type of installation, for example, to create a test or demonstration environment.

- To create another response file, repeat the tasks in Create a Response File (page 12-4). Save the new response file.
- To use a response file to provision a new environment, go to Provision a New Oracle Fusion Applications Environment (page 13-1).

13

Provision a New Oracle Fusion Applications Environment

This section describes in detail the tasks necessary to perform a physical installation, configuration, and deployment of the product offerings specified in the response file. This section includes the following topics:

- Introduction to Provisioning a New Oracle Fusion Applications Environment (page 13-1)
- Installation Phases and Types of Hosts in a Multiple-Host Environment (page 13-2)
- Prerequisites to Provisioning a New Oracle Fusion Applications Environment (page 13-3)
- Provision a New Environment on Multiple Hosts (page 13-4)
- Perform the Installation (page 13-5)
- What to Do Next (page 13-17)

13.1 Introduction to Provisioning a New Oracle Fusion Applications Environment

In the response file that is created, the configuration details necessary to run a physical installation of Oracle Fusion Applications product offerings are specified. For full-scale environments, typically the offerings must be provisioned on multiple hosts, and the installation must be run from a shared drive that is accessible to all hosts.

The installation process is run in phases, in an assigned order. Complete each phase, in order, on each host, before moving to the next phase. All phases must be completed successfully on all the hosts in the environment to create a fully operational applications environment.

If a failure is encountered with any of the provisioning phases, see Troubleshoot an Oracle Fusion Applications Environment (page 14-1), for information about how to recover from failure, by automatically completing the cleanup phase on all provisioning hosts, followed by the restore phase on all provisioning hosts.

After the cleanup and restore phases are complete without failure on all provisioning hosts, rerun the provisioning phase on the provisioning hosts that failed previously, then continue with the remaining provisioning phases. Do not rerun the provisioning phase on the provisioning hosts that were successful.

13.2 Installation Phases and Types of Hosts in a Multiple-Host Environment

Provisioning provides scripts that read from the response file and take action for each installation **phase** (target). As each phase is run, its progress is tracked on a related screen in the Provisioning Wizard user interface.

Run the Provisioning Wizard on the primordial host to create a provisioning response file. If the Provisioning Wizard is run on a non-primordial host to create a provisioning response file, the validation assumes that the host is the primordial host. Ensure that the validation errors are interpreted correctly as they may not be applicable to the non-primordial host.

When provisioning a new environment, the Provisioning Wizard should only be run on the primordial host and the Provisioning Command-Line Interface on non-primordial hosts.

Installation phases and the names of the tracking screens are as follows:

- **Preverify**: Checks to see that all prerequisites are present. Tracked on the **Prerequisite Checks** screen.
- **Install**: Installs applications, middleware, and database components. Creates the applications Oracle home directory. Tracked on the **Installation** screen.

  The database schema owner password complexity check is run at the end of the Install phase. See Database Schema User Password Complexity Rule (page 8-30).
- **Preconfigure**: Prepares application and middleware components for deployment and creates `appid` users and groups. Modifies the Oracle Application Development Framework (Oracle ADF) configuration file in the applications enterprise archive (EAR) files to use the database as the Oracle Metadata Services (MDS) Repository. Also updates the connections.xml file in all applications EAR files with endpoint information. Tracked on the **Preconfigure** screen.
- **Configure**: Creates and configures Oracle WebLogic Server domains, Managed Servers, and clusters; applies templates; creates and configures data sources, queues, and topics; configures middleware (wiring); and deploys applications product offerings to domains. Tracked on the **Configure** screen.
- **Configure-secondary**: Performs the configure actions on a primary or secondary host or both. If there is no primary or secondary host, or if there is only a primary host, this phase runs, but takes no action. Tracked on the **Configure Primary/ Secondary** screen.
- **Postconfigure**: Performs online tasks, such as configuring the Node Manager, deploying the service-oriented architecture (Oracle SOA Suite) composite, establishing Oracle HTTP Server wiring, seeding policies, and setting up postdeployment security configuration. Tracked on the **Postconfigure** screen.
- **Startup**: Starts the Administration Server and Managed Servers for each domain on the host where this phase is running. Tracked on the **Startup** screen.
- **Validate**: Performs a variety of post-provisioning validations, such as server and application availability, successful loading of identity credentials, and validation of data source. Tracked on the **Validation** screen.

Actions related to Oracle Identity Management components are performed only in specific phases. See Installation Phase Actions for Oracle Identity Management Components (page 10-15).

If a failure is encountered and the automatic cleanup and restore phases are executed, the cleanup and restore phase runs these tasks automatically:

Cleanup: Shuts down processes started during a failed phase and performs the necessary cleanup actions. If the automated cleanup fails, manually stop all processes except the Node Manager on all hosts including OPMN and Java EE processes before running the restore action. Note, however, *all* processes must be stopped if the cleanup action is running on the configure phase.

Restore: The necessary restore actions required for a given provisioning phase. This action deletes and restores the instance directory, and, if necessary (and available), restarts the Common domain Administration Server and Oracle HTTP Server.

See Recovery After Failure (page 14-4) for more information about cleanup and restore actions.

The number of hosts and their purpose determines the order in which the applications environment is provisioned.

- **Primordial host**: Location of the Common domain (specifically the Administration Server of the Common domain). Only one primordial host exists in each environment.
- **Primary host**: Location where the Administration Server for a domain runs. Only one primary host exists in a domain.
- **Secondary host**: Location where the Managed Servers for any application reside when they are not on the same host as the Administration Server of the same domain. The term, secondary host, is meaningful when a domain spans across more than one physical server. The server(s) that does not have the administration server is(are) called secondary host(s).
- **DMZ host**: A host that cannot access the shared storage within the firewall is said to be in a demilitarized zone (DMZ). Typically used to install Oracle HTTP Server so that restrictions on communication with components within the firewall can be enforced. See Set Up a Demilitarized Zone (DMZ) for the Web Tier (page 6-9).

Run the Provisioning Wizard on the primordial host to create a provisioning response file. If the Provisioning Wizard is run on a non-primordial host to create a provisioning response file, the validation assumes that the host is the primordial host. Ensure that the validation errors are interpreted correctly as they may not be applicable to the non-primordial host.

When provisioning a new environment, the Provisioning Wizard should only be run on the primordial host and the Provisioning Command-Line Interface on non-primordial hosts.

13.3 Prerequisites to Provisioning a New Oracle Fusion Applications Environment

Before beginning the physical installation, ensure that the following tasks have been completed:

- All setup details as described in Prepare for an Installation (page 5-1)

- All installation tasks associated with the transaction database as described in Install Oracle Fusion Applications Transaction Database (page 8-1)
- A response file with the required configuration details as described in Create a Response File (page 12-1)

For Solaris 11 Only

Ensure that the Solaris Package SUNWttf-bh-luxi is installed on the FA servers. Do this for both Oracle Solaris on SPARC (64-bit) and Oracle Solaris on x86-64 (64-bit) platforms.

For Solaris 11.3, ensure that the OS level packages installed are of version 11.3.3.6.0 or higher.

13.4 Provision a New Environment on Multiple Hosts

To provision a new environment, start the Provisioning Wizard on the primordial host, make a selection from the options menu, and indicate the location of the response file. The wizard presents a review of the details in the response file on a series of interview screens.

Changes can be made to most of the response file details on the interview screens. However, changes cannot be made to the product offerings. A new response file must be created to change the offering mix.

After completing the preverify phase successfully on all the hosts in the environment, and clicking **Next** to start the install phase on the primordial host, it is not longer possible to modify any sections of the response file.

Run the phases *in order*, and complete *each* phase on *all* hosts in the environment before beginning the next phase. The Provisioning Wizard enables to monitor the progress and success of each phase across all hosts.

If a separate DMZ host is setup for the web tier, open a separate terminal session for that host and run all provisioning phases (except the preverify phase). To ignore preverify phase errors, use the command line argument `-ignoreSysPrereqs` true in the runProvisioning command. It is not possible to view the build processes on the DMZ host on the primordial host interface because the DMZ host does not have access to the shared network drive.

For example, if there are three hosts — Host A (primordial host), Host B (primary host) and Host C (secondary host) — the process of provisioning those hosts works like this:

1. Open a terminal session on Host A, Host B, and Host C. Log in to each host.
2. Start the Provisioning Wizard on Host A, select **Provision an Applications Environment**, and specify the location of the response file.
3. Page through the wizard screens and make any necessary changes to the response file details displayed. If the option to view individual domain details on the **Provisioning Configuration** screen is selected, those screens are also added to the interview. Review the summary of installation actions that is taken for this response file.
4. When clicking **Next** on the **Summary** screen, the wizard initiates the preverify phase on Host A and displays the **Prerequisite Checks** screen. Track the progress of this phase on this screen.

5. From the command line on the Host B and Host C terminal sessions, enter the syntax to run the preverify phase. (Do not wait for a phase to run to completion on the primordial host before starting the same phase on any of the other hosts.)
6. View the results of the preverify phase for all hosts on the **Prerequisite Checks** screen. The **Next** button is not enabled until the preverify phase has been completed successfully on all hosts. Click **Back** to navigate through previous screens to fix errors. Resolve all errors before continuing.

   After clicking **Next** to move to the **Installation** screen (the **install** phase), it is not longer possible to go back to previous screens.
7. When there are no errors, click **Next** to initiate the install phase on Host A.
8. From the command line on the Host B and Host C terminal sessions, enter the syntax to run the install phase.
9. View the results on the **Installation** screen on Host A. When the phase has been completed successfully on all hosts, click **Next** on the Installation screen to initiate the next phase and display the next tracking screen. The phases are listed in Installation Phases and Types of Hosts in a Multiple-Host Environment (page 13-2).
10. Repeat this process for the remaining phases until all have been completed successfully.

A full backup of the provisioning and configuration state is performed automatically at the end of each successfully completed phase. The backup is saved in *APPLICATIONS_BASE*`/restart/`.

13.5 Perform the Installation

To provision an environment, start the Provisioning Wizard and page through the installation screens to initiate each phase and monitor the build processes. Note that Oracle Fusion Middleware Oracle homes and Oracle Fusion Applications Oracle home are read-only, and customers are not expected to update or install any components manually to these home directories. These home directories can be updated only by Oracle Fusion Applications lifecycle tools, such as Provisioning, RUP Installer, and Patch Manager.

WARNING: If any warnings were ignored during the creation of the response file, fix all issues stated in the warnings before successfully provisioning an environment. Make those changes in this installation interview. The wizard saves the changes to the original response file and proceeds with the new instructions. All validations must pass before running the **install** phase.

13.5.1 Start the Wizard and Prepare to Install

Ensure that the inventory pointer file (`oraInst.loc`) was created when the provisioning framework was installed. If the file was created in `/etc`, ignore the `-invPtrLoc` command line argument. If the file was created in another location, add the `-invPtrLoc` argument to the command line syntax and indicate the location of the inventory. See Use the Command-Line Interface for Installations on the Primary and Secondary Hosts (page 13-15).

To start provisioning the new environment:

1. Open a terminal session and log in to the primordial host.

2. Open a terminal session and log in to each of the other hosts in the environment, including the DMZ host (if present).
3. Set the *JAVA_HOME* environment variable to point to the JDK location in the provisioning repository. For example:

   UNIX:

   `export JAVA_HOME=repository_location/jdk`

   `export PATH=$JAVA_HOME/bin:$PATH`
4. Verify that the LIBPATH value is null.
5. On UNIX systems, set the DISPLAY environment variable to an active and authorized display.
6. Run the following command on the primordial host:

   UNIX:

   `cd framework_location/provisioning/bin`

   `./provisioningWizard.sh`

   Solaris:

   Use `bash provisioningWizard.sh` instead of `./provisioningWizard.sh`.

MANDATORY: Steps 3 to 6 must be applied on the primordial host and also on all other provisioning hosts specified in the provisioning response file.

In **UNIX**, by default, the provisioning framework uses the directory specified in the environment variable *$PROVTMP*, as the location to write temporary files during provisioning. If it is not defined then the value specified in the following environment variables is used: *$TMPDIR*, *$TMP*, *$TEMP*. If none of these is set, then */tmp* is used.

To change the temporary location, set the *$PROVTMP* environment variable before starting the Provisioning Wizard and provisioning command line.

13.5.2 Install Oracle Fusion Applications

Table 13-1 (page 13-6) illustrates the steps required to provision a new environment on multiple hosts. Notice that after running the first phase (preverify) on all hosts, the steps to run the remaining phases are the same. Move to each subsequent phase, in the assigned order.

In the table, UI denotes a step performed in the Provisioning Wizard, and CLI denotes a step performed on the command line.

For help with any of the Provisioning Wizard screens, click **Help**.

When the Provisioning Wizard is run to provision an applications environment and any issue occurs during provisioning, the error and warning messages are displayed at the bottom of the screen.

Table 13-1 Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
UI: Welcome Screen	No action is required on this read-only screen. Click **Next** to continue.

Table 13-1 (Cont.) Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
UI: Specify Central Inventory Location	This screen displays only if one or more of the following conditions are not met: • The `-invPtrLoc` option is used to specify the central inventory location on non-Windows platforms. Thus, the default value for the platform is not used. Note that the default value for Linux platforms is `/etc/oraInsta.loc`. For Solaris, the default value is `/var/opt/oracle/oraInst.loc`. • The Central Inventory Pointer File is readable. • The Central Inventory Pointer File contains a value for `inventory_loc`. • The `inventory_loc` directory is writable. • The `inventory_loc` directory has at least 150K of space. • `inventory_loc` is not an existing file. Specify the location of the **Central Inventory Directory** that meets the previous criteria. The `inventory_loc` directory can be created by the `createCentralInventory.sh` script and does not have to exist at the time its location is specified. For non-Windows platforms, in the **Operating System Group ID** field, select or enter the group whose members are granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. The **Inventory Location Confirmation** dialog prompts to run the *`inventory_directory`*`/createCentralInventory.sh` script as root, to confirm that all conditions are met and to create the default inventory location file, such as `/etc/oraInst.loc`. After this script runs successfully, return to the interview and click **OK** to proceed with the installation. To continue the installation without root access, select **Continue installation with local inventory**. Click **OK** to proceed with the installation. For information about setting the Inventory Directory, see oraInventory Planning (page 4-19). Note that the directory specified for `inventory_loc` in the `oraInst.loc` file must be created already. Otherwise, the preverify phase reports this as an error and it must be corrected by creating the directory in the file system before continuing. For more information about inventory location files, see Oracle Universal Installer Inventory in the *Oracle Universal Installer User's Guide*. Click **Next** to continue.
UI: Installation Options Screen	Presents the list of valid installation options that can be performed using the provisioning wizard. Select **Provision an Applications Environment**. Enter the path in the **Response File** field to the response file to be used to provision the environment. Or click **Browse** to navigate to the response file location. Click **Next** to continue.

Table 13-1 (Cont.) Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
UI: Response File Description Screen	This is the information entered when the response file was initially created. It is not associated in any way with the executable plan file, or the summary file, that is saved when this response file was initially created. It is possible to change the response file name, version, and description before provisioning is run. • **Response File Name**: Specify a name to identify this response file. • **Response File Version**: Assign a version to this response file. Version numbers are intended only for documentation purposes. • **Created By**: Defaults to the operating system user who invoked the wizard. Set when the response file is initially created and cannot be modified for the current response file. • **Created Date**: Defaults to the date that the response file was initially created and saved. Set when the response file was initially created and cannot be modified for the current response file. • **Response File Description**: Provide a description of this response file. Click **Next** to continue.
UI: Installation Location Screen	Displays the credentials for the Node Manager and the directory locations entered in the response file. If these values have changed, make corrections on this screen. See Installation Location Details (page 13-12). Click **Next** to continue.
UI: Review Provisioning Configuration Screen	Lists the wizard interview screens where the domain-specific parameters were originally specified for this response file. Changes can be made to this information if necessary. **Note**: If any warnings are ignored during the creation of this response file, all issues stated in the warnings must be fixed before successfully provisioning an environment. Select any of the screens displayed here to make changes for a product domains with warnings. All validations must pass before running the **install** phase. Product offerings cannot be added or deleted to this response file. To change product offerings, create a new response file. Select one or more options from the list. After clicking **Next**, the screens selected are added to the flow. Note that in case of returning to this screen after running the preverification checks, those verification checks are invalidated. Thus, run the Preverify phase again. Click **Next** to continue.

Table 13-1 (Cont.) Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
UI: Summary Screen	Review the information displayed to ensure that the installation details are correct. To make changes, click **Back** to return to previous screens in the interview. Click **Next** to initiate the **preverify** phase. The wizard displays the **Prerequisite Checks** screen, and creates a current copy of this response file. The response file is saved in the directory indicated in the message pane. Click **Next** to continue.
UI: Prerequisite Checks Screen	The **preverify** phase performs prerequisite checks for Oracle Fusion Applications provisioning on the primordial host. The host is marked with a **Home** symbol in the **Host** column. The **Domains** column lists the domains that are being deployed. After this phase has been inititated on the primary and secondary hosts (from the command line), the build processes for those hosts are also shown. The **Status** column indicates the progress of each phase for each host: • **Block**: Processing has not yet started on this host for the named phase. • **Clock**: Performing the build for a phase. • **Check mark**: The build was completed successfully. • **x mark**: The build has failed for this phase. Correct the errors before continuing. • **Restricted** symbol: The validation process has stopped due to a failure within another process. Click an **x** or a **Restricted** symbol to display messages about failures. Click the host-level **Log** file for details about this phase. Click a build **Log** file to see details specific to that build. Changes can be made to the interview screens and rerun the **preverify** phase as many times as is necessary. Note that when changes to the response file are made and **preverify** is rerun, Oracle Fusion Applications Provisioning requires that the application configuration directory be empty. Click **Retry** to rerun this phase if errors are reported. Fix all errors before continuing. See Troubleshooting Preverify Phase Errors (page 14-8).

Table 13-1 (Cont.) Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
CLI and UI: Run the preverify phase on primary and secondary hosts from the command line and monitor progress in the UI.	In the terminal session for the primary and secondary host, run the **preverify** phase with this command: UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target preverify **Note**: The same provisioning phases can be run in parallel on all hosts simultaneously if the provisioning process has been started in the primordial host first. However, each new provisioning phase must be run in the specific order listed in Installation Phases and Types of Hosts in a Multiple-Host Environment (page 13-2). Thus, a new phase cannot be started until the previous phase has been completed successfully on all the hosts. Monitor the progress of the preverify phase using the **Prerequisite Checks** screen on the primordial host. Click **Retry** to rerun this phase if errors are reported. See Troubleshoot Preverify Phase Errors (page 14-8). When this phase is complete with no errors on all hosts, click **Next**. The wizard starts the install phase on the primordial host and displays the Installation screen. When the preverify phase is successful on the primordial host, place a copy of the response file and the generated provisioning plan (*APPLICATIONS_BASE*/provisioning/plan/provisioning.plan) on the DMZ host. **Note:** If an incremental provisioning is performed, see Extend an Oracle Fusion Applications Environment Using Incremental Provisioning During Upgrade (page 27-1). If the webtier is placed in DMZ, then in addition of copying the generated provisioning.plan from incremental provisioning to the DMZ host, it is also necessary to copy the introspect response file (introspect.rsp)located in *APPLICATIONS_BASE*/provisioning/introspect/introspect.rsp. **Note:** After clicking**Next**, the response file cannot longer be modified.
UI: Installation Screen	Displays the progress of the **install** phase on the primordial host. Build messages and **Log** icons track the progress for all phases in the same manner as described for the preverify phase.
CLI and UI: Run the install phase on the primary, secondary, and DMZ (if present) hosts and monitor the progress in the UI.	In the terminal session, run the **install** phase on the primary, secondary, and the DMZ host (if present) with this command: UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target install Monitor the progress on the Installation screen on the primordial host.

Table 13-1 (Cont.) Provisioning a New Applications Environment

Interface (UI or CLI)	Action Required
CLI and UI: Copy the `webtier_dmz_artifacts.zip` file to the DMZ host (if present).	After the **install** phase is complete, copy the `webtier_dmz_artifacts.zip` file from *`APPLICATIONS_BASE/`* directory on the non-DMZ host to the *`APPLICATIONS_BASE/`* directory on the DMZ host (if present). Click **Next** to initiate the **preconfigure** phase on the primordial host. The wizard displays the **Preconfigure** screen.
UI: Preconfigure Screen	Displays the progress of the **preconfigure** phase on the primordial host.
CLI and UI: Run the preconfigure phase on the primary, secondary, and DMZ (if present) hosts and monitor the progress in the UI.	In the terminal session, run the **preconfigure** phase on the primary, secondary, and the DMZ host (if present) with this command: UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target preconfigure` Monitor the progress on the **Preconfiguration** screen on the primordial host.
UI and CLI: Initiate the remaining phases (in order) on the primordial, primary, secondary, and DMZ (if present) hosts.	After the **preconfigure** phase reports a successful completion on each host in the environment, return to the primordial host and click **Next** to initiate the next phase. As each new phase is started on the primordial host, on the command line, enter the command to run that phase on the primary, secondary, and DMZ host (if present) on the command line. See Table 13-4 (page 13-16) for a list of all the phases, and the command-line syntax. The associated screens, in phase order, are as follows: • **Configure** (**configure** phase) • **Configure Primary/Secondary** (**configure-secondary** phase) • **Postconfigure** (**postconfigure** phase) • **Startup** (**startup** phase) After the phases are complete with no errors, click **Next** on the **Startup** screen to initiate the **validate** phase and then start this phase on the other hosts.
UI: Validation	When the validate phase is complete with no errors on all hosts, click **Next**.
UI: Installation Complete	This screen displays the configuration of the new environment. Click **Finish**. The wizard automatically saves a summary file that describes this installation. The file is saved to the response file directory as follows: *`framework_location`*`/provisioning/provisioning-responseFile/`*`provisioning_response_file_name-timedate`*`.summary`.

Note that if a new environment is provisioned on a single host, ignore the steps that run from the command line. Each phase starts automatically on the primordial host when clicking **Next**.

13.5.3 Installation Location Details

The wizard displays the Node Manager credentials and the locations of the various directories entered when this response file was created. You can change these values, if necessary.

Node Manager Credentials

- **User Name**: Specify a user name for the Node Manager role.
- **Password**: Specify a password for the Node Manager and retype it in the **Confirm Password** field.

Provide locations of various directories that the administrator needs access to.

Installation and Configuration

- **Installers Directory Location**: Enter the path to the *repository_location* directory created when the provisioning repository was downloaded.
- **Applications Base**: Enter the directory path to the Oracle home specified when the provisioning framework was installed. This directory is the Fusion Applications Oracle home. It is the `root` directory for all Oracle Fusion Applications and Oracle Fusion Middleware products.

  The applications base directory must not be set to the system root directory or set to the root directory of a logical drive. Some lifecycle management tools computed directory names by backing up one directory level from the applications base directory and then appending the appropriate subdirectory name. These tools fail if the applications base directory is set to the system root directory or set to the root directory of a logical drive because it is not possible to back up one directory level from the system root directory or from the root directory of a logical drive.

  In a UNIX environment, this name cannot exceed 59 characters.
- **Applications Configuration**: This directory is automatically populated based on the value specified in the **Applications Base** field. This value is the path to the directory where the configuration files for the domain are written.**Enable Local Applications Configuration**: Select this checkbox to run the Managed Servers from a non-networked (local) disk on the host, visible only to the processes running on that host. If this option is enabled, the wizard copies the domain configuration from the shared location and places it on the local disk you specify. This configures all Managed Servers to run from the non-networked location.
- **Enable Local Applications Configuration**: Select this check box to run the Managed Servers from a non-networked (local) disk on the host, visible only to the processes running on that host. If this option is enabled, the wizard copies the domain configuration from the shared location and places it on the specified local disk. This configures all Managed Servers to run from the non-networked location.
- **Local Applications Configuration**: Specify the location for the local domain directory that is set up. This field is required if the **Enable Local Applications Configuration** option is selected. The specified directory must be empty.

Middleware Dependencies

- **Font Directory**: Appears only if the Oracle Sales, Oracle Marketing, or Oracle Financials offerings are selected. Enter the directory where the TrueType fonts are installed. The location varies on different operating systems, but is typically found here:

- **Linux x86-64**: `/usr/X11R6/lib/X11/fonts/TTF`
- **Oracle Solaris**: `/usr/X11R6/lib/X11/fonts/TrueType`

Some systems may not have TrueType fonts installed. If the fonts cannot be located on the system, verify that they have been installed. In addition, the fonts directory shipped as part of the JRE installed in the repository can be used. Regardless of which path are specified, access to .ttf (.TTF) files is necessary.

Oracle Business Intelligence Repository Password

RPD Password: Specify and **Confirm** a password to allow access to the metadata repository (RPD) for both Oracle Business Intelligence Applications and Oracle Transactional Business Intelligence. The password must be between 8 and 30 characters and contain at least one digit. It can include letters, numbers, pound sign (#), dollar sign ($), or underscore (_). To include a dollar sign ($) in the RPD password, enter one additional dollar sign ($) as the escape character before the dollar sign ($) in the password. Provisioning sets up this password, but does *not* actually access the repository.

13.5.4 Oracle Fusion Applications Post-Installation Checklist

This checklist is an addition to the automated validation that takes place during the validate phase of Oracle Fusion Applications Provisioning. See Perform Validation Steps in the *Oracle Fusion Applications Cloning Administrator's Guide*.

The Oracle Fusion Applications Administrator should also perform a final environment validation of the entire stack. Table 13-2 (page 13-13) gives a high-level list of such tasks.

Table 13-2 Technical Stack Validation

Component	Task	Expected Outcome
WLS Console (Oracle Identity Management)	Connect to the WLS Console of the IDMDomain using a browser (point directly at the WLS AdminServer port).	Connect successfully and check the status of the servers in the domain.
EM Console (Oracle Fusion Applications)	Connect to the EM Console of each Fusion Applications Domain using a browser (point directly at the WLS AdminServer port).	Connect successfully and check the status of the Fusion Middleware components (including BI, WebCenter, ESS, SOA) as well all the Fusion Applications managed servers for each domain.
SSO/Home Page (Oracle Fusion Applications)	Open the Fusion Applications Homepage using a browser (point at the CommonDomain OHS host/port or LBR if the environment has one).	Redirection to the OAM SSO login screen. After logging in, see the Fusion Applications Homepage and no error messages. If there are error messages, attempt to refresh the page as they may simply be timeouts since this is the first time the page is being accessed.
Functional Setup	Navigate to Setup and Maintenance page using the Navigator Menu.	See the Setup and Maintenance page with no error messages.

Table 13-2 (Cont.) Technical Stack Validation

Component	Task	Expected Outcome
Scheduled Jobs	Navigate to the Scheduled Jobs page using the Navigator Menu. *	See the Scheduled Jobs page with no error messages.
Reports and Analytics	Navigate to the Reports and Analytics page using the Navigator Menu. *	See the Reports and Analytics page with no error messages. Click on the folders to display the available reports.

* If the Scheduled Jobs or Reports and Analytics links do not appear in the Navigator Menu, enable them in Functional Setup:

- Navigate to **Setup and Maintenance** using the Navigator Menu.
- Use the Search box to search for the **Work Menu**. The results are displayed on the right and should include **Manage Menu Customizations**.
- Click on **Go to Task** (next to Manage Menu Customizations).
- Find the **Scheduled Jobs** or **Reports and Analytics** menu items on the tree and make sure they are configured as visible/rendered.

13.5.5 Perform a Manual Backup

A manual backup can be performed, for example, if the automated backup after a phase fails.

Run these commands for each phase, preverify through postconfigure, and for each host in the environment.

For Linux x86-64:

```
/bin/tar -C $APPLICATIONS_CONFIG/instance -cf $APPLICATIONS_CONFIG/restart/
backup_phase_name/instance.tar
```

If local configuration is enabled, also run these commands for each host:

```
/bin/tar -C $LOCAL_CONFIG/domains -cf $APPLICATIONS_CONFIG/restart/
backup_local_phase_name/hostname/domains/localdomains.tar

/bin/tar -C $LOCAL_CONFIG/applications -cf $APPLICATIONS_CONFIG/restart/
backup_local_phase_name/hosthame/applications/localapplications.tar

/bin/tar -C $LOCAL_CONFIG/biinst -cf $APPLICATIONS_CONFIG/restart/
backup_local_phase_name/hostname/biinst/BIInstance.tar
```

For Oracle Solaris:

```
/bin/tar -cEf $APPLICATIONS_CONFIG/restart/backup_phase_name/instance.tar -C
$APPLICATIONS_CONFIG/instance
```

If local configuration is enabled, also run these commands for each host:

```
/bin/tar -cEf $APPLICATIONS_CONFIG/restart/backup_local_phase_name/hostname/
domains/localdomains.tar -C $LOCAL_CONFIG/domains

/bin/tar -cEf $APPLICATIONS_CONFIG/restart/backup_local_phase_name/hostname/
```

```
applications/localapplications.tar -C $LOCAL_CONFIG/applications

/bin/tar -cEf $APPLICATIONS_CONFIG/restart/backup_local_phase_name/hostname/
biinst/BIInstance.tar -C $LOCAL_CONFIG/biinst
```

13.5.6 Use the Command-Line Interface for Installations on the Primary and Secondary Hosts

The installation phases on the primary and secondary hosts are run from the command line, using specific arguments to further define the necessary actions.

13.5.6.1 Add Arguments to Phase Commands

Table 13-3 (page 13-15) shows valid arguments used when running installation phases.

Table 13-3 Command-Line Syntax for Phase Arguments

Syntax	Description
path_to_script	Directory path to the location of the build scripts. This directory is set up when the provisioning framework is installed, for example *framework_location*/provisioning.
-responseFile	Provide the location of a previously saved response file. Input is: *response_file_location*
-target	Indicates that the script should run a specific installation phase (target). Any *phase_name* is a valid argument, for example, -target perverify.
-ignoreSysPrereqs	Options: true|false Default: false. -ignoreSysPrereqs true is the same as -ignoreSysPrereqs with no value. Adding this argument disables validation for database, schema, and hosts, and enables to progress to the **install** phase without having to fix failure issues. Checks continue to be performed, but failures are ignored. Can be used as an argument with both the provisioningWizard and the runprovisioning commands. If specified with runprovisioning -target install, the Oracle Universal Installer exceptions are ignored. If this argument is specified for the **preverify** phase, specify it for all the remaining phases (**install**, **preconfigure**, **configure**, **configure-secondary**, **postconfigure**, **startup**, and **validate**). If it is not specified for the remaining phases, a phase guard exception will be raised.

Table 13-3 (Cont.) Command-Line Syntax for Phase Arguments

Syntax	Description
`-invPtrLoc`	Specifies the location of the Oracle Inventory directory, which is used by the installers to keep track of which Oracle products are installed on a host. For example, the `runProvisioning` command with this argument would be: UNIX: *`path_to_script`*`/runProvisioning.sh -invPtrLoc /home/oracle/oraInst.loc`.

Note that the `-plan` argument in previous releases was replaced by the `-responseFile` argument.

13.5.6.2 Run the Installation Phases

Table 13-4 (page 13-16) shows the command-line syntax for running the various installation phases.

In the command syntax, ensure that `path_to_script` is a local drive and not an UNC path.

Table 13-4 Installation Phase Syntax

Phase (Target)	Command Syntax
Preverify	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location -target preverify`*
Install	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target install`
Preconfigure	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target preconfigure`
Configure	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target configure`
Configure-secondary	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target configure-secondary`
Postconfigure	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target postconfigure`
Startup	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target startup`
Validate	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target validate`
Cleanup-*phase_name*	UNIX: *`path_to_script`*`/runProvisioning.sh -responseFile` *`provisioning_response_file_location`* `-target cleanup-` *`phase_name`* Substitute *phase_name* with the appropriate provisioning phase (install, preconfigure, configure, configure-secondary, or postconfigure) to perform a cleanup action.

Table 13-4 (Cont.) Installation Phase Syntax

Phase (Target)	Command Syntax
Restore-*phase_name*	UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target restore-*phase_name* **Note:** Substitute *phase_name* with the appropriate provisioning phase (install, preconfigure, configure, configure-secondary, or postconfigure, startup, validate) to perform a restore action.

13.6 Next Steps

After completeing provisioning a new Oracle Fusion Applications environment, proceed to Troubleshoot Your Oracle Fusion Applications Environment (page 14-1) for troubleshooting instructions.

14

Troubleshoot an Oracle Fusion Applications Environment

This section describes how to troubleshoot an Oracle Fusion Applications environment. There are various resources available to help with errors that occur during the provisioning of a new Oracle Fusion Applications environment.

- General Troubleshooting (page 14-1)
- Provisioning Log Files (page 14-2)
- Recovery After Failure (page 14-4)
- Troubleshoot Preverify Phase Errors (page 14-8)
- Troubleshoot Install Phase Errors (page 14-13)
- Troubleshoot Postconfigure Phase Errors (page 14-15)
- Troubleshoot Startup Phase Errors (page 14-16)
- Troubleshoot Validate Phase Errors (page 14-18)
- What to Do Next (page 14-19)

14.1 General Troubleshooting

General Troubleshooting Tips

The following are some general troubleshooting tips:

- This release of Oracle Fusion Applications relies on certified versions of supported platforms documentation for Oracle Fusion Applications for details about hardware and software, minimum disk space and memory requirements, required system libraries, packages, or patches, and minimum database requirements.
- If incorrect information is entered on one of the installation screens, return to that screen by clicking **Back** until the screen is shown.
- When an environment is provisioned, provisioning writes debug information to the debug directory (*APPLICATIONS_BASE*`/provisioning/debug`).
  - Do not delete any files from this directory.
  - Troubleshoot errors using the files in this directory.
- The Classloader Analysis Tool (CAT) is a Web-based class analysis tool which simplifies filtering classloader configuration and aids in analyzing classloading issues, such as detecting conflicts, debugging application classpaths and class conflicts, and proposes solutions to help to resolve them. CAT is deployed to every WebLogic domain out of the box. For more information about the Classloader Analysis Tool, see Using the Classloader Analysis Tool (CAT) in the *Oracle Fusion Middleware Developing Applications for Oracle Weblogic Server Guide*.

Backup Tar Creation

During the postconfigure phase, a "Value too large for defined data type" error message might be displayed while creating the backup tar.

```
[2016-11-16T00:18:06.695-08:00] [runProvisioning-postconfigure] [WARNING]
[] [runProvisioning-postconfigure] [tid: 4881] [ecid:
0000LXgDiJbFW73LVmc9yc1OAcO70000KP,0]  [exec] tar: ./domains/<hostname>/
CommonDomain/ucm/cs/vault/timesize.test: Value too large for
defined data type [2016-11-16T00:18:37.455-08:00] [runProvisioning-
postconfigure] [NOTIFICATION] [] [runProvisioning-postconfigure]
[tid: 1] [ecid: 0000LXa6sikFW73LVmc9yc1OAcO7000001,0]  [logStatus]
State=Error!Timestamp=2016-11-16 00:18:37 PST!
Target=backup-instance!Category=backup!Domain=None!Host Name=<hostname>!
Product Family=orchestration!Product=orchestration!Task=backup!Task
ID=orchestration.orchestration.None.backup-instance.None!Message=Unable to
create backup of /scratch/mwport/FAREL12/APPTOP/instance at /scratch/
mwport/FAREL12/APPTOP/provisioning/restart/backup_postconfigure: exec
returned: 1!Detail=!Build File=/scratch/mwport/REL12_ST12/provisioning/
provisioning-build/common-restart -build.xml!Line Number=662!
```

Resolution

Follow these steps to resolve the issue:

- Review the error and find out the file causing the "Value too large for defined data type" error
- Open that file using the file editor and close it
- Run cleanup and restore for postconfigure target
- Rerun postconfigure target

14.2 Provisioning Log Files

Log files contain information about both normal and problematic events. They can help to diagnose and address some problems. For example, log messages that state that a service cannot be reached might indicate a hardware failure.

If a more complex issue is discovered, My Oracle Support personnel may use log files to trace the execution code paths of relevant requests as part of diagnosing the problem. Log files are particularly helpful if the Oracle Fusion Applications environment contains custom code that needs debugging, especially when using a debugger is not feasible (such as on a production system).

During each provisioning phase, the Provisioning Wizard writes the actions of the build processes to a log file created for each domain. Click the **Log** file icon to see details and error messages. In the log file, search for a specific text string, or move forward and backward through the content. The wrap feature enables text to be easily printed, or even forwarded by email.

In some cases, it might be important to review the log files written by provisioning to find out more about the errors that are encounter and recommended corrective actions. For example, any error during cleanup or restore. Provisioning writes log files to the following location:

UNIX:

APPLICATIONS_BASE/logs/provisioning/*host_name*

This shared location is accessible from all hosts, and contains the following log files:

- runProvisioning-default-main.log: The main log file.
- runProvisioning-*phase_name*.log: The main log file for a given phase, containing the output and error streams. These logs are used by the wizard to keep track of internal information. For example, for runProvisioning-preverify.log, each provisioning thread then writes its own log to runProvisioning-*product_family-phase_name*.log.
- runProvisioning-*product_family-phase_name*.log: Displayed in the Provisioning Wizard as a **Log** icon for preconfigure, configure, configure-secondary, postconfigure, and startup phases. The files contain detailed information about the phase. For example, runProvisioning-fin-preverify.log contains information about the preverify actions taken while creating the Oracle Fusion Financials domain.

Because all reference roles must be provided in each product log file, expect to see duplicate reference role entries.

Provisioning also relies on the Oracle Universal Installer (OUI), which writes log files as follows:

UNIX:

Oracle_Inventory_Location/logs

If the location of the Oracle Inventory directory is unknown, it is possible to find it at:

UNIX: /etc/oraInst.loc

Note that *APPLICATIONS_BASE* is the root directory under which the provisioned environment resides. Except for the web tier host, this physical location must be on a shared drive.

In addition to log file locations discussed in this section, note these log file locations associated only with the preconfigure, configure, configure-secondary, postconfigure, and startup phases:

- Oracle WebLogic Server:

  UNIX: *APPLICATIONS_CONFIG*/domains/*host_name/domain_name*/servers/*server_name*/logs

- Oracle WebLogic Server Node Manager:

  UNIX: *APPLICATIONS_BASE*/fusionapps/wlserver_10.3/common/nodemanager/*host_name/*

14.2.1 Modify the Default Log Level

The default log level for provisioning is TRACE:1 and NOTIFICATION:1 for messages written to provisioning log files and console, respectively. The definition of loggers controlling the log level for provisioning log files and console are described as:

```
<logger name="runProvisioning-default-main" level="TRACE:1">

<handler name="default-main"></handler>

</logger>
```

```
<logger name="runProvisioning-console" level="NOTIFICATION:1">

<handler name="prov-cons-handler"></handler></logger>

</loggers>
```

To change the log level, modify the corresponding logger definition in the *framework_location*/provisioning/bin/prov-logging-config.xml file.

For more information about log level attributes, see Setting the Level of Information Written to Log Files in the *Oracle Fusion Middleware Administering Oracle Fusion Middleware*.

14.2.2 Default Log Level for Managed Servers

The default log level for standard out, that is, output to the command line console, for managed servers is set to NOTIFICATION to provide additional information when investigating issues, particularly around start up for managed servers.

14.3 Recovery After Failure

The wizard performs automated cleanup and recovery actions. If those processes cannot clean up and restore the session, perform the actions manually.

See Start and Stop Components in the *Oracle Fusion Applications Administrator's Guide* for complete instructions for stopping and starting components.

14.3.1 Automated Cleanup and Recovery

Recovery is intended to be systemwide. If a failure occurs on one server, cleanup and recovery steps must be performed on all servers, including the hosts on which the phase completed successfully. During the installation, errors may occur during the running of any of the installation phases. To use the abort feature, it might necessary to perform some cleanup tasks as well.

A **Retry** button is available on each provisioning phase interview screen to initiate cleanup on the primordial host for that phase, or on a non-primordial host if that is where provisioning was started. Initiating the retry operation affects the full phase, beginning with the primordial host or the host from which provisioning was started. The Retry UI explicitly tells on which hosts execute cleanup, and specifies the command to use to run cleanup. A message displays that tells which host the cleanup target is being run on. If additional cleanup is required on other hosts, those host names are specified after the cleanup target completes. The wizard indicates what cleanup tasks are required, enables the **Continue** button, and waits until clicking **Continue** after completing the additional cleanup. Clicking **Continue** initiates a process to confirm whether the cleanup is complete. If no additional cleanup is required, the **Continue** button remains disabled, and the wizard starts executing the restore action.

When the restore completes on the current host, a message again displays that tells which hosts execute restore, along with the command to run. The **OK** button is enabled when the restore is done on the current host. When clicking **OK**, a process checks again to confirm whether the restore is complete and an error message displays if the restore is not complete. When the restore is done, the phase restarts on the current host if needed. If the phase does not need to run, the retry window closes and the information from the previous run of the phase displays. In the hosts table at the top of the screen, all hosts that were either in a failed or aborted state before the

retry is started, are reset when the retry window closes. Then, restart the phase from the command line for all hosts with a reset status.

The wizard detects hosts that require cleanup and displays a message informing of the host names. Perform the cleanup action from the command line on these hosts before initiating any restore action. Command-line syntax for the cleanup action takes the following form:

UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target cleanup-*phase_name*

The command-line syntax for the restore action takes the following form:

UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target restore-*phase_name*

These actions are available for the preverify, install, preconfigure, configure, configure-secondary, postconfigure, startup, and validate phases. They are also available for shutdown and deinstall actions.

14.3.2 Run Cleanup and Restore

When a failure occurs during one of the provisioning phases, fix the cause of the error and then retry the provisioning phase on the hosts that previously failed using the Provisioning Wizard and the provisioning command-line interface if the failed hosts are primary or secondary hosts.

To retry a provisioning phase, initiate it starting with the primordial host by clicking **Retry** on the Provisioning Wizard. The wizard starts the cleanup phase on the primordial host.

- When prompted, execute a cleanup phase from the command line on each of the hosts that failed the provisioning phase. Do so simultaneously on all failed hosts.
- After the cleanup phase completes successfully on all the hosts, continue with the restore phase followed by a retry of the provisioning phase. Start the restore phase first from the primordial host through the Provisioning Wizard, and run the restore phase from the command line on the other hosts from the terminal session. Do so simultaneously on all hosts.
- After the restore phase is successful on all hosts, rerun the failed provisioning phase.

When a failure occurs during one of the provisioning phases, do the following:

1. Click **Retry** to run the cleanup action on the primordial host (Common domain host).
2. If the environment contains additional hosts, the wizard displays a message giving the names of the other hosts.
3. Run the cleanup action from the command line on the other hosts in the terminal session. This can be done in parallel.

   UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target cleanup-*phase_name*
4. Click **Continue**. If all cleanup steps are completed on **all** hosts where required, the wizard starts the restore action on the primordial host or prompts to complete steps that have not been completed. Click **Continue** again when finished to start the restore action on the primordial host.

5. If the environment contains other hosts, the wizard displays a message giving the names of the other hosts.

6. Run the restore action from the command line on the other hosts from the terminal session for each host. This action can run in parallel.

   UNIX: *path_to_script*/runProvisioning.sh -responseFile *provisioning_response_file_location* -target restore-*phase_name*

7. Click **OK** on the primordial host to start the next phase. The wizard displays the same messages as described in Step 4 (page 14-5) if all additional hosts have not been restored.

14.3.3 Handle Cleanup Failures

The automated cleanup and restore actions cannot handle every type of failure. Sometimes manual steps are needed. This is true, for example, when the configure phase fails and any of the following situations exists:

- Node Manager is not yet configured
- Node Manager is configured with an invalid trust key
- Administration Server is not yet registered with the Node Manager
- Administration Server is not running

Under any of these circumstances, the Node Manager will not be able to shut down the Administration Server and the Managed Servers during cleanup-*phase_name*. Shut down manually all servers before continuing with the restore-*phase_name*.

1. Shut down Web Tier processes, if any, with this command:

   UNIX: *APPLICATIONS_CONFIG*/CommonDomain_webtier/bin/opmnctl shutdown.

   This applies to cleanup-configure, cleanup-configure-secondary, and cleanup-postconfigure.

2. Shut down Oracle Business Intelligence processes, if any, by running:

   UNIX: *BI_CONFIG_HOME*/bin/opmnctl shutdown.

   This applies to cleanup-configure, cleanup-configure-secondary, and cleanup-postconfigure.

3. Shut down Global Order Promising (GOP) (if provisioned) with this command:

   UNIX: *gop_instance_base*/bin/opmnctl shutdown.

   This applies to cleanup-postconfigure.

4. Shut down Java EE applications using the method recommended for the Oracle WebLogic Server.

   This applies to cleanup-configure, cleanup-configure-secondary, and cleanup-postconfigure.

5. Shut down Node Manager only if it was not configured correctly. See Restart Node Manager on PROVISIONED_HOST (page 18-82).

Errors during cleanup of a target produce messages that inform of the error and display the contents of the associated log file. When scrolling through a message, additional messages can be viewed, including the manual steps that should be taken to fix the problem.

Note that failures during `cleanup-install` require the following specific cleanup tasks:

1. Run the Oracle Universal Installer deinstall process for each component against the same `oraInventory` that provisioning uses.
2. Delete the install phase guards. Find them under *`APPLICATIONS_CONFIG`*`/provisioning/phaseguards/`.

14.3.4 Handle Remnant Processes

Provisioning cannot reliably stop all grandchild processes associated with failures during the running of a phase. Occasionally, remnant processes are present after a failure. Oracle recommends to manually check and stop all remnant processes that start from the *`APPLICATIONS_BASE`* and the *`framework_location`*`/provisioning` folder, except for Node Manager and the Provisioning Wizard.

Take this action after completing the cleanup action for any phase, and before running a restore action for that phase. Without this additional cleanup action, unwanted interference may be experienced with the restore action and subsequent rerun logic. This is especially true for long-running child processes such as LDAP policy migration.

Identify remnant processes in the *APPLICATIONS_BASE* as follows:

Linux: `ps -ef | grep` *`APPLICATIONS_BASE/folder_name`*

Identify remnant processes in the *`framework_location`*`/provisioning` folder as follows:

Linux: `ps -ef | grep` *`framework_location`*`/provisioning/`*`folder_name`*

Remember, do *not* stop the Node Manager and UI processes.

14.3.5 Handle Restore Failures

If the automated restore operation fails, complete these manual steps for all phases, except as noted:

1. Delete the restart phase guard (*phase_name*`.grd`) file associated with the failure. It is located under *`APPLICATIONS_BASE`*`/restart/`.
2. Restore the `instance` directory from the backup, located as follows:

   UNIX: *`APPLICATIONS_BASE`*`/restart/backup_`*`phase_name/`*`instance.tar`

   Execute the following commands to restore the `instance` directory:

   UNIX:

   `rm -rf` *`CONFIG_HOME`*

   `mkdir` *`CONFIG_HOME`*

   `tar -xfv` *`path_to_instance`*`.tar/instance.tar -C` *`CONFIG_HOME`*
3. When a local application configuration has been enabled, manually restore the `localdomains` and `localapplications` configuration directories on every *`local_application_config_host`*:

   UNIX: *`APPLICATIONS_BASE`*`/restart/backup_`*`phase_name/`*
   `local_application_config_host``/localdomains.tar` and...

UNIX: *APPLICATIONS_BASE*/restart/backup_*phase_name*/*local_application_config_host*/localapplications.tar

In addition, restore the following file related to Oracle Business Intelligence:

UNIX: *APPLICATIONS_BASE*/restart/backup_*phase_name*/*local application_config_host*/biinst/BIInstance.tar

4. For `restore-configure-secondary` and `restore-postconfigure` only, start the CommonDomain Administration Server.
5. For `restore-`*`postconfigure`* only, start Oracle HTTP Server by running *WT_CONFIG_HOME*`/bin/opmnctl startall`. Oracle HTTP Server must be started from the host where it is installed. It cannot be started from any other host.
6. For `restore-configure` and `restore-postconfigure`, check the restore logs to see if the Oracle Business Intelligence schema restore operation is complete. Perform the restore operation for the database contents first.

14.4 Troubleshoot Preverify Phase Errors

Some errors might be encountered during the preverify phase. This section details troubleshooting information for the preverify phase errors.

14.4.1 Preverify Phase Prerequisite Condition Failed on Red Hat Enterprise 6

The following error message is displayed during the preverify phase if Oracle Fusion Applications is installed on the Red Hat Enterprise 6 platform:

```
[2013-03-22T12:13:01.241+05:30] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify]
[tid: 10] [ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0]
[validateInstallersPrerequisite] Check Name:CertifiedVersions

[2013-03-22T12:13:01.243+05:30] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify]
[tid: 10] [ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0]
[validateInstallersPrerequisite] Check Description:This is a prerequisite
condition to test whether the Oracle software is certified on the current
O/S or not.

[2013-03-22T12:13:03.175+05:30] [runProvisioning-preverify] [NOTIFICATION]
[] [runProvisioning-preverify] [tid: 10]
[ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0]
[validateInstallersPrerequisite] Expected result: One of
oracle-6,oracle-5.6,enterprise-5.4,enterprise-4,enterprise-5,redhat-5.4,re
dhat-4,redhat-5,SuSE-10,SuSE-11

[2013-03-22T12:13:03.178+05:30] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify]
[tid: 10] [ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0]
[validateInstallersPrerequisite] Actual Result: redhat-Red

[2013-03-22T12:13:03.180+05:30] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify]
```

```
[tid: 10] [ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0]
[validateInstallersPrerequisite] Check complete. The overall result of
this check is: Failed <<<<

[2013-03-22T12:13:16.718+05:30] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify] [tid:
10] [ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0] [logStatus]
STATE=BUILD_ERROR!TIMESTAMP=2013-03-22 12:13:16 IST!TARGET=private-
preverify-installers-prerequisite!CATEGORY=BUILD_ERROR!DOMAIN=NONE!
HOSTNAME=in-mum-orafus02.corp.capgemini.com!PRODUCTFAMILY=orchestration!
PRODUCT=orchestration!TASK=validateInstallersPrerequisite!
TASKID=orchestration.orchestration.BUILD_ERROR.private-preverify-
installers-prerequisite.validateInstallersPrerequisite!MESSAGE=The OUI
installer prerequisite check failed:: Product :
webtier Product : wc Product : soa Product : ecm_bucket2
Product: atgpf Product : odi Product : fusionapps Product : gop !
DETAIL=The OUI installer prerequisite check failed :: Product : webtier|
Product : wc|Product: soa|Product : ecm_bucket2|Product : atgpf|Product :
odi|Product : fusionapps|Product : gop|!BUILDFILE=/u04/prov/provisioning/
provisioning-build/common-preverify-build.xml!LINENUMBER=1354!

[2013-03-22T12:13:16.793+05:30] [runProvisioning-preverify] [ERROR]
[FAPROV-01045] [runProvisioning-preverify] [tid: 10]
[ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0] *** Validation Error! ***[[]]

[2013-03-22T12:13:16.797+05:30] [runProvisioning-preverify]
[ERROR] [] [runProvisioning-preverify] [tid: 10]
[ecid:0000JqGpNU12JRbptGc9yX1HIzpD000000,0] The OUI installer prerequisite
check failed :: Product : webtier[[Product : wc

Product : soa

Product : ecm_bucket2

Product : atgpf

Product : odi

Product : fusionapps

Product : gop

]]
```

This is caused by an error in the operating system validation. Apply the following workaround to resolve the issue:

1. Locate the file `common-preverify-build.xml` in provisioning framework location, *FRAMEWORK_LOCATION*`/provisioning/provisioning-build/ common-preverify-build.xml`.
2. Comment out the following block of code by adding "<!-- comment out per workaround" at the beginning and "-->" at the end, as shown below.:

   ```
   <if>

   <isfalse value="$
   {provisioning.setup.common.core.disable.preverify.prerequisite}"/>

   <then>
   ```

```
<logStatus state="BUILD_STARTED" category="installers"
task="validateInstallersPrerequisite"/>

<!-- bug fix 12771983 -->

<if>

<os family="windows"/>

<then>

<antcall target="private-preverify-installers-prerequisite"/>

</then>

<else>

<trycatch property="error-message">

<try>

<envAntCall target="private-preverify-installers-prerequisite"
AdditionalAntOpts="-d64" RunWlstEnvScript="false"/>

</try>

<catch>

<simulateValidationError message="${error-message}"/>

</catch>

</trycatch>

</else>

</if>

<logStatus state="BUILD_COMPLETE" category="installers"
task="validateInstallersPrerequisite"/>

</then>

</if>
```

TO:

```
<!-- comment out per workaround

<if>

<isfalse value="${provisioning.setup.common.core.
disable.preverify.prerequisite}"/>

<then>

<logStatus state="BUILD_STARTED" category="installers"
task="validateInstallersPrerequisite"/>

<!-- bug fix 12771983 -->

<!-- comment out per workaround

<if>

<os family="windows"/>

<then>
```

```
<antcall target="private-preverify-installers-prerequisite"/>
</then>
<else>
<trycatch property="error-message">
<try>
<envAntCall target="private-preverify-installers-prerequisite"
AdditionalAntOpts="-d64" RunWlstEnvScript="false"/>
</try>
<catch>
<simulateValidationError message="${error-message}"/>
</catch>
</trycatch>
</else>
</if>

<logStatus state="BUILD_COMPLETE" category="installers"
task="validateInstallersPrerequisite"/>
</then>
</if>
-->
```

3. Save the file and retry the preverify phase.

14.4.2 Preverify Phase Not Displaying All Validation Errors on non-Primordial Hosts

When there is a build error in the preverify phase in the primordial host, not all validation errors in the non-primordial hosts will be accounted for in the Provisioning Wizard. This is because a build error, which is a much more severe error than validation, occurs in the primordial host before the logic to count validation errors. After fixing the issue that caused the build error and rerunning preverify phase, the validation errors are counted and displayed correctly. This is normal and expected.

Resolve the issue that caused the build error in the primordial host first and rerun preverify phase to find out if there are other validation errors among the hosts. Fix the validation errors where appropriate until validation errors are resolved before proceeding to the next phase.

14.4.3 Preverify Phase Required Free Space is Higher than Actually Provisioned

During the preverify phase, an error might be displayed saying provisioning requires more free space for the local application configuration directory in the current host like the log below:

```
[2012-02-03T23:11:27.659-08:00] [runProvisioning-preverify]
[NOTIFICATION] [] [runProvisioning-preverify] [tid: 12]
[ecid: 0000JL7CzeGBDCAnv^n3F11FBDbj000003,0]
[logStatus] STATE=BUILD_ERROR!TIMESTAMP=2012-02-
03
23:11:27PST!TARGET=private-preverify-filesystem-Free-space!CATEGORY=BUILD_ERROR!
DOMAIN=NONE!HOSTNAME=adcdk16!PRODUCTFAMILY=orchestration!PRODUCT=orchestration!
TASK=validateFileSystem!TASKID=orchestration.orchestration.BUILD_ERROR.private-
preverify-filesystem-free-space.validateFileSystem!MESSAGE=The file system /
scratch/aime/rc4 only has 44271 MB, but 76800 MB is needed!
DETAIL=The file system /scratch/aime/rc4 only has 44271
MB, but 76800 MB is needed!BUILDFILE=/net/adcgei13/
scratch/aime/rc4/FAINTEG_MAIN_PLATFORMS_120131.1600/provisioning/provisioning-
build/common-preverify-build.xml!LINENUMBER=1392!
[2012-02-03T23:11:27.698-08:00] [runProvisioning-preverify] [ERROR]
[FAPROV-01045] [runProvisioning-preverify] [tid: 12] [ecid:
0000JL7CzeGBDCAnv^n3F11FBDbj000003,0] *** Validation Error! ***[[ ]]
```

After provisioning completes, it might be possible that only a fraction of the required file system is being used. This is normal. The 77 GB free space is the Oracle recommended value derived from the performance benchmark. It includes projection of disks required for storing diagnostic logs and other information in the local domain over a long period.

14.4.4 Preverify Phase Failure for PS Package

During the preverify phase in Solaris 5.11 environments, an error might be displayed saying that PS version 0.5.11 is not available.

```
[2016-11-15T14:00:45.485+00:00] [runProvisioning-preverify] [ERROR]
[]  [runProvisioning-preverify] [tid: 22] [ecid:
0000LXcIVwd6ATI5Irg8yf1OAlGw000003,0] PS version 0.5.11 required for
Provisioning on Sun Solaris 5.11 is not available.  Please install the correct
UCB PS package
```

Execute the below commands to find out the version of the PS package in the environment:

```
PS_UCB_PKG=`pkg search -l -r /usr/ucb/ps|grep pkg|awk '{print $4}'`
PS_UCB_VERSION=`echo $PS_UCB_PKG | cut -f2 -d"@" | cut -f1 -d"-"`
echo PS_UCB_VERSION=${PS_UCB_VERSION}
```

If the **PS_UCB_VERSION** value is 0.5.11, then the above error does not have any functional impact and can be ignored.

To ignore the error, run the preverify target with the command line argument '-ignoreSysPrereqs true' in the runProvisioning command.

14.4.5 Preverify Phase Warning

If the Human Capital Management (HCM) application offerings is being provisioned, namely Workforce Development and Workforce Deployment, and the `/mnt/hwrrepo` directory does not exist, a warning message is displayed.

- Continue with the provisioning process if the Workforce Reputation (HWR) application is not needed.

- If the HWR application is required, follow the instructions in Create the hwrepo directory (page 5-11) to prepare the shared mount. Complete provisioning the environment first then prepare the shared mount before starting using the HWR application.

14.5 Troubleshoot Install Phase Errors

This section includes troubleshooting information for install phase errors.

14.5.1 Cancel an Installation in Progress

Interrupt the installation process while it is in progress by clicking **Cancel**, or by clicking the **X** icon next to a build that has failed. If **Cancel** is clicked, all processes running in the background are terminated and put in a **Failed** status.

Start the wizard again after initiating a **Cancel** action. The wizard detects that the installation has been partially completed, and presents two options:

- Resume from where it was left off. The wizard asks to resume. Click **Yes**.

  The wizard takes to the screen where **Cancel** was clicked and created the failure. Restart the installation at that point by clicking the **Retry** button. The wizard performs cleanup and recovery actions.
- Clean up the errors manually and rerun the **Provision a New Applications Environment** option for the response file from the beginning.

14.5.2 Install Phase Failed with INST-07221: Specified connect string is not in a valid format Error

When a provisioning response file is created using the Oracle Fusion Applications Provisioning Wizard, if only one RAC node information is provided for the Oracle Fusion Applications database, then the following error is shown during the install phase in the `runProvisioning-install.log`. The error is generated due to a limitation in the Oracle Data Integrator (ODI) installer and at least two RAC nodes must be provided.

```
[2012-08-21T10:40:21.365-04:00] [runProvisioning-install] [NOTIFICATION]
[] [runProvisioning-install] [tid: 31] [ecid:
0000J_9c8_p7U8lCgvq2So1GCtIP00000M,0] Starting Oracle Universal
Installer...[[

Checking if CPU speed is above 300 MHz. Actual 1600 MHz Passed

Checking Temp space: must be greater than 300 MB. Actual 7107 MB Passed

Checking swap space: must be greater than 512 MB. Actual 14527 MB Passed

Preparing to launch Oracle Universal Installer
from /tmp/OraInstall2012-08-21_10-40-14AM. Please wait ...Log: /u01/app/
oraInventory/logs/install2012-08-21_10-40-14AM.log

Copyright (c) 1999, 2011, Oracle and/or its affiliates. All rights
reserved.

Reading response file..
```

```
Verifying data......

[VALIDATION] [ERROR]:INST-07221: Specified connect string is not in a
valid format

[VALIDATION] [SUGGESTION]:Provide the value in the following format.
Format: hostname:port:servicename , For Real Application Cluster Database
hostname1:port1^hostname2:port2@servicename

installation Failed. Exiting installation due to data validation
failure.]]

[2012-08-21T10:40:21.387-04:00] [runProvisioning-install]
[NOTIFICATION] [] [runProvisioning-install] [tid:
10] [ecid: 0000J_9V7RD7U8lCgvq2So1GCtIP000000,0]
[logStatus] STATE=BUILD_ERROR!TIMESTAMP=2012-08-21
10:40:21 EDT!TARGET=install!CATEGORY=none!DOMAIN=NONE!
HOSTNAME=<host.com>!PRODUCTFAMILY=orchestration!PRODUCT=orchestration!
TASK=none!TASKID=orchestration.orchestration.NONE.install.NONE!MESSAGE=An
Error Occured: !DETAIL=The following error occurred while
executing this line:|<FRAMEWORK_LOCATION>/provisioning/provisioning-build/
orchestration-build.xml:3132: The following error occurred while
executing this line:|<FRAMEWORK_LOCATION>/provisioning/provisioning-build/
common-misc-build.xml:109: An Error Occured: The following error
occurred while executing this line:

|<FRAMEWORK_LOCATION>/provisioning/provisioning-build/ base-product-
family-build.xml:85: The following error occurred while
executing this line:|<FRAMEWORK_LOCATION>/provisioning/provisioning-
build/fs-build.xml:281: The following error occurred while
executing this line:|<FRAMEWORK_LOCATION>provisioning/provisioning-
build/fs-build.xml:1448: The following error occurred
while executing this line:|<FRAMEWORK_LOCATION>/provisioning/
provisioning-build/base-techstack-build.xml:62: The following error
occurred while executing this line:|<FRAMEWORK_LOCATION>/
provisioning/provisioning-build/ odi-build.xml:326: OUI installer
failed: <REPOSITORY_LOCATION>/installers/odi/Disk1/runInstaller!
BUILDFILE=<FRAMEWORK_LOCATION>/provisioning/provisioning-build/ common-
misc-build.xml!LINENUMBER=107!
```

Resolution

Provide the information for at least two RAC nodes on the **Database Configuration** page of the Provisioning Wizard, save the response file, and then restart the provisioning process to deploy a new Oracle Fusion Applications environment as detailed in the following steps:

1. If the Provisioning Wizard is still active, close the window and exit.
2. Delete the entire contents of the `APPLICATIONS_CONFIG` folder including the folder. This is the location for Oracle Fusion Applications Home displayed on the **Installation Location** page of the Provisioning Wizard. If Local Applications Configuration is enabled, ensure that the `Local Applications Configuration` directory and its contents are deleted.
3. Start the Provisioning Wizard and select the **Update an Existing Provisioning Response file** option. Select the existing Provisioning Response file.

4. Navigate to the **Database Configuration** page.
5. To use a single node RAC database, select **Single-Instance Database** and enter the database host, port and service name. To use a multi-node RAC database, ensure that the RAC nodes are available and enter the database host, port and service name. If **Real Application Clusters Database** is selected, enter at least two rows in the table.
6. Complete the remaining steps to finish creating a response file.
7. Follow the instructions to begin provisioning a new Oracle Fusion Applications environment starting with the preverify phase. Note that it is not necessary to restore the Oracle Fusion Applications database instances or the Oracle Identity Management databases from backup because the provisioning framework does not update the databases at this time.

14.6 Troubleshoot Postconfigure Phase Errors

The following section describes the steps to troubleshoot postconfigure phase errors.

14.6.1 Postconfigure Phase Oracle SOA Suite Server Startup Errors

During the postconfigure phase, some error messages might be encountered in the provisioning log for a domain (for example, in `runProvisioning-crm-postconfigure.log`).

```
[2013-12-02T01:51:38.122-08:00] [runProvisioning-crm-postconfigure]
[NOTIFICATION] [] [runProvisioning-crm-postconfigure] [tid: 94]
[ecid:0000KAmi6CyEGRK5IVd9if1Ib5CC00001L,0] Starting
serversoa_server1 ..................................................
..................................................................
..................................................................
.....................................................Exception while
starting server 'soa_server1'[[No stack trace available.

This Exception occurred at Mon Dec 02 01:51:38 PST 2013.

weblogic.management.scripting.ScriptException: Error occured while
performing start : Server with name soa_server1 failed to be started

Problem invoking WLST - Traceback (innermost last):

File "/scratch/aime/FINS_IP/
apptop/provisioning/debug/<host_name>/postconfigure_02_12_13_01_29_43/
nodeManagerStartServer_CRMDomain4661859561054870083.py", line 329, in ?

File "/scratch/aime/FINS_IP/
apptop/provisioning/debug/<host_name>/postconfigure_02_12_13_01_29_43/
nodeManagerStartServer_CRMDomain4661859561054870083.py", line 187, in
startServer

File "<iostream>", line 1279, in start

File "<iostream>", line 1847, in raiseWLSTException
```

```
WLSTException: Error occured while performing start : Error starting
the server : Error occured while performing start : Server with name
soa_server1 failed to be started

Use dumpStack() to view the full stacktrace
```

This can be because the ODI server and the domain admin server are on different hosts

and

either the ODI server is the last Oracle Fusion Middleware server to be configured

or

the ODI server is isolated on a separate host when the **Advanced Topology** option is selected on the Domain Topology Configuration screenduring the creation of the Oracle Fusion Applications provisioning response file to specify the placement of each servers on the provisioning hosts.

Resolution

Follow these steps to resolve the issue:

1. Run `cleanup-postconfigure` and then `restore-postconfigure`.
2. Log in to the respective domain admin console for which server startup failed.
3. Fix the Node Manager details of the host being used by the ODI server. Change the Listen Address of the host to the ODI server address using the following steps:
    a. Select **Environment** -> **Machines** from the **Domain Structure** menu.
    b. Click the machine name link.
    c. In the **Settings for <a machine name>** window, select **Configuration** -> **Node Manager**.
    d. Update the Listen Address by entering the host name of the ODI server address. Click **Lock & Edit** located in the top left corner of the Change Center panel.
    e. Enter the host address, click **Save** and then click **Release Configuration**.
    f. Continue rerunning the postconfigure phase.

14.7 Troubleshoot Startup Phase Errors

The following section describes the steps to troubleshoot startup phase errors.

Startup Phase Failed with “EQA-15011: The plug-in manager raised an unexpected error”

If you enable local application configuration for a multihost environment, errors may occur during the startup phase with the following messages in the provisioning log:

```
(<APPLICATIONS_BASE>/logs/provisioning/<host name>/runProvisioning-
startup.log)
```

The errors are due to the timing between the startup of managed servers that happened before the time required for permission grants to propagate from the policy store to the affected managed servers.

1. Plug-in manager error

```
[2013-07-18 15:04:53 PDT] Orchestration: private-configure-
webcenter-ses-task synchronized - BUILD_ERROR
:
<FRAMEWORK_LOCATION>/provisioning/provisioning-build/webcenter-
build.xml:2570: Unable to create SES source object
with name: SecureWebCenterRssSource due to error: EQA-15011:
The plug-in manager raised an unexpected error.

[2013-07-18 15:04:54 PDT] Orchestration: private-startup
synchronized - BUILD_ERROR : <FRAMEWORK_LOCATION>/provisioning/
provisioning-build/orchestration-build.xml:2152: The following
error occurred while executing this line: <FRAMEWORK_LOCATION>/
provisioning/provisioning-build/webcenter-build.xml:2435: Process
execution failed with return code: 1. Check the
logs for more information.
```

2. SES Error

```
[2013-07-23T23:20:46.182-07:00] [runProvisioning-startup]
[NOTIFICATION] [FAPROV-01161] [runProvisioning-startup] [tid:
10] [ecid: 0000K0FLNcF3Z7P_Idt1if1Hvr8A000000,0] [arg:
<FRAMEWORK_LOCATION>/provisioning/provlocks/ses.lck] [arg: 23 Jul
2013 23:20:46 PDT] Released lock on file <FRAMEWORK_LOCATION>/
provisioning/provlocks/ses.lck at time 23 Jul 2013 23:20:46 PDT

[2013-07-23T23:20:46.266-07:00] [runProvisioning-startup]
[NOTIFICATION] [] [runProvisioning-startup] [tid:
10] [ecid: 0000K0FLNcF3Z7P_Idt1if1Hvr8A000000,0]
[logStatus] STATE=BUILD_ERROR!TIMESTAMP=2013-07-23
23:20:46 PDT!TARGET=private-configure-webcenter-
ses-task!CATEGORY=BUILD_ERROR!DOMAIN=NONE!HOSTNAME=adcdav01!
PRODUCTFAMILY=orchestration!PRODUCT=orchestration!TASK=synchronized!
TASKID=orchestration.orchestration.BUILD_ERRO. private-configure-
webcenter-ses-task.synchronized!MESSAGE=<FRAMEWORK_LOCATION>/
provisioning/provisioning-build/webcenter-build.xml:2570: Unable
to create SES source object with name: SecureWebCenterRssSource
due to error: EQA-15011: The plug-in manager raised
an unexpected error.!DETAIL=Unable to create SES source object with
name: SecureWebCenterRssSource due to error: EQA-15011: The plug-in
manager raised an unexpected error.!BUILDFILE=<FRAMEWORK_LOCATION>/
provisioning/provisioning-build/webcenter-build.xml!LINENUMBER=2445!

[2013-07-23T23:20:46.266-07:00] [runProvisioning-startup]
[ERROR] [FAPROV-00298] [runProvisioning-startup] [tid:
10] [ecid: 0000K0FLNcF3Z7P_Idt1if1Hvr8A000000,0] An
Error Occured:[[<FRAMEWORK_LOCATION>/provisioning/provisioning-
build/webcenter-build.xml:2570: Unable to create SES
source object with name: SecureWebCenterRssSource due
to error: EQA-15011: The plug-in manager raised an unexpected error.
```

Resolution

1. Wait for 10 minutes after the error occurs.
2. Restart these managed servers in the Common Domain from the WebLogic Admin Console: `UCM_server1` (in UCMCluster), `WC_Spaces` (FS_SPACECluster), and `search_server1` (SESCluster) using the Node Manager credentials that you entered in the provisioning response file. You can find the URL for the Command Domain WebLogic Admin Console (`http://host:port/console`) in the provisioning summary file (the file name is `provisioning.summary`) located in the same place as the provisioning response file. The following example shows what the entries in the provisioning summary might look like:

   ```
   Common Domain
   Admin Server
   Host: host_name
   Managed Server Port: port_number
   Admin Console
   http://<host>:<port>/console
   Enterprise Manager Welcome Page
   http://<host>:<port>/em
   ```

3. After all three affected managed servers are restarted, rerun the provisioning startup phase

14.8 Troubleshoot Validate Phase Errors

The following section describes the steps to troubleshoot Validate phase errors.

14.8.1 Validate Phase Topology Manager Service Endpoint Invocation Error

During the Validate phase, the following errors might be encountered:

`INFO: WSM-09004 Component auditing cannot be initialized error` and

```
SEVERE: Error while invoking endpoint "http://<host>:<7004>/
topologyManagerService/ProvisionConfigurationService" from client.
```

The log messages in the `runProvisioning-fs-postconfigure.log` files are as follows:

```
[2012-12-11T01:24:08.130-08:00] [runProvisioning-fs-postconfigure]
[TRACE] [] [runProvisioning-fs-postconfigure] [tid:
402] [ecid: 0000Ji9Ho1B3r2GLIyT4if1GljTr000069,0] [SRC_CLASS:
oracle.apps.fnd.provisioning.ant.taskdefs.util.logger.ProvisioningLogger]
[SRC_METHOD: log] Attempt 1 of 20 for importProvisionDeployedInfo

[2012-12-11T01:24:10.767-08:00] [runProvisioning-fs-postconfigure] [ERROR]
[] [runProvisioning-fs-postconfigure] [tid: 403] [ecid:
0000Ji9Hp6F3r2GLIyT4if1GljTr00006A,0] INFO: WSM-09004 Component auditing
cannot be initialized.

[2012-12-11T01:24:10.772-08:00] [runProvisioning-fs-postconfigure] [ERROR]
[] [runProvisioning-fs-postconfigure] [tid: 403] [ecid:
```

```
0000Ji9Hp6F3r2GLIyT4if1GljTr00006A,0] INFO: WSM-09004 Component auditing
cannot be initialized.

[2012-12-11T01:24:11.676-08:00] [runProvisioning-fs-postconfigure]
[ERROR] [] [runProvisioning-fs-postconfigure] [tid: 403]
[ecid: 0000Ji9Hp6F3r2GLIyT4if1GljTr00006A,0] SEVERE: Error
while invoking endpoint "http://<host>:<port>/topologyManagerService/
ProvisionConfigurationService" from client.
```

This error message occurs when the validation is initiated by the provisioning framework before the Oracle Web Service Manager (OWSM) is fully initialized. The provisioning framework will retry up to a predetermined number of times, therefore such error messages can be ignored. However, if validation fails after 20 attempts, investigate the issue.

14.8.2 Out-of-the-Box Configuration for B2BUI

Post provisioning, Business to Business UI (B2BUI) is stopped, or in a `PREPARED` state on all domains, except the `CommonDomain`. The B2BUI is in an ACTIVE state on the `CommonDomain`.

14.9 What to Do Next

To prepare the Oracle Fusion Applications installation for functional implementation, perform several configuration tasks, some of which are common for all Oracle Fusion Applications or multiple components of the Oracle Fusion Applications suite, and some are specific to the individual components.

15

Complete Mandatory Common Post-Installation Tasks

This section describes the mandatory post-installation tasks to complete before starting working with Oracle Fusion Applications.
This section contains the following topics:

- Introduction to Completing Mandatory Post-Installation Tasks (page 15-1)
- Apply Patches to the New Environment (page 15-1)
- Update the MDS Schema Database Statistics (page 15-1)
- Update the MDS Schema Database Statistics (page 15-1)
- Set Up Notifications (page 15-2)
- Create a Custom Index for SYSAUX Segments (page 15-4)
- Next Steps (page 15-5)

15.1 Introduction to Completing Mandatory Post-Installation Tasks

After successfully completing the installation phases on all the hosts in the environment, perform the following required manual steps described in this section.

Some components in the Oracle Fusion Applications environment are dependent on one another. Therefore, it is important to start and stop components in the proper order. In the course of normal IT operations, common operations include shutting down computers and starting them back up. Therefore, it is crucial to start and stop Oracle Fusion Applications in a sequential manner. See Start and Stop an Oracle Fusion Applications Environment in the *Oracle Fusion Applications Administrator's Guide*.

15.2 Apply Patches to the New Environment

Refer to Oracle Fusion Applications release notes for mandatory post-installation steps, including the application of all mandatory patches. For general information about applying patches to an applications environment, see Introduction to Patching Oracle Fusion Applications in the *Oracle Fusion Applications Patching Guide*.

15.3 Update the MDS Schema Database Statistics

After Oracle Fusion Applications is deployed and provisioned, ensure optimized query plans for Oracle Metadata Services (MDS) queries are generated so that performance does not decline until the next automatic statistics collection window. For each MDS schema, execute the following statements in SQL*Plus as a privileged database user, for example SYS.

1. Execute the following command to regather the statistics:

   ```
   execute dbms_stats.gather_schema_stats(

   ownname =>'schemaOwner',

   estimate_percent =>dbms_stats.auto_sample_size,

   method_opt =>'for all columns size auto',

   cascade => true);
   ```

   Replace *schemaOwner* with the name of the schema, for example FUSION_MDS. Also, place the entire command in a single line at the time of execution.

2. If there is no performance improvement after collecting statistics, then flush the shared pool to clear the execution plan for the database and generate a new query plan, using the following command:

   ```
   alter system flush shared_pool;

   alter system flush buffer_cache;
   ```

   Perform this action only when the system is not being actively used as it may affect the performance of production systems.

15.4 Set Up Notifications

Oracle User Messaging Service is a component of Oracle SOA Suite, which enables to receive notifications sent from SOA applications.

Applications in the following product families receive approval notifications and complete approvals and rejections of requests through e-mail:

- Oracle Fusion Customer Relationship Management
- Oracle Fusion Financials
- Oracle Fusion Human Capital Management
- Oracle Fusion Supply Chain Management
- Oracle Fusion Procurement
- Oracle Fusion Project Portfolio Management

Before proceeding, ensure that an e-mail server exists. If the bulk e-mail feature of Oracle Fusion Customer Relationship Management is intended to be used, set up the e-mail to handle bulk e-mail. To configure an e-mail server, see Adding an E-Mail Server in the *Oracle Fusion Middleware Administrator's and Developer's Guide for Oracle Business Intelligence Publisher*.

15.4.1 Configure E-Mail Notification Using Oracle SOA Suite

Configure Oracle SOA Suite as follows to enable e-mail notifications:

1. For existing users, associate the users with their e-mail addresses in the domain.
2. For new users, do the following:
   a. Add user profile in the domain.
   b. Create e-mail account in the e-mail server for the added user.
   c. Associate the user profile with the respective e-mail address.

3. Configure e-mail driver properties.

   To enable the workflow participants to receive and forward notifications, configure Oracle User Messaging Service by setting the appropriate driver instances with Oracle Enterprise Manager Fusion Applications Control.

   a. In the navigation pane, expand **farm** - **User Messaging Service** - **usermessagingdriver-email**.

   b. Go to **User Messaging Email Driver** - **Email Driver Properties**. The Email Driver Properties page displays.

   c. In the **Driver-Specific Configuration**, modify the **Outgoing** and **Incoming** properties with the following:

      Modify `OutgoingMailServer`, `OutgoingMailServerPort`, `OutgoingDefaultFromAddr`, `OutgoingUsername`, and `OutgoingPassword`.

      Modify `IncomingMailServer`, `IncomingMailServerPort`, `IncomingMailIDs`, `IncomingUserIDs`, `IncomingUserPasswords`, and `receivefolder`.

   d. Select the **ImapAuthPlainDisable** checkbox.

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

   To configure e-mail driver properties for other **usermessagingdriver-email** services under **farm** - **User Messaging Service**, repeat Steps a to e.

4. Configure notification properties to enable workflow e-mail notifications using Oracle Enterprise Manager Fusion Applications Control:

5. a. In the navigation pane, expand **farm** - **SOA**.

   b. Go to **SOA Infrastructure** - **SOA Administration** - **Workflow Notification Properties**. The Workflow Notification Properties page displays.

   c. From the **Notification Mode** list, choose **All**.

   d. In the **Notification Service** section, specify the notification channel values. These properties are used to notify the users of any changes to the state of a task. Workflow notifications can use three types of addresses:

      From Address: For sending notifications.

      Actionable Address: For receiving actionable responses. The Actionable Address is the account in which task action-related e-mails are received and processed by human workflow.

      Reply To Address: For receiving reply notifications.

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

   To configure workflow notification properties for other Oracle SOA Suite servers, repeat Steps 3a to 3e.

6. Specify the actionable e-mail account name using Oracle Enterprise Manager Fusion Applications Control:

   a. In the navigation pane, expand **farm** - **SOA**.

   b. Go to **SOA Infrastructure** - **SOA Administration** - **Workflow Task Service Properties**. The Workflow Task Service Properties page displays.

   c. In the **Actionable Email Account** field, specify the incoming actionable e-mail account to use. The default account name is `Default`, which is the account

configured in Step 3. If a different account name is specified in the **Actionable Email Account** field, then create and configure that account.

For more information on configuring human workflow notification properties, see Configuring Human Workflow Notification Properties in the *Oracle Fusion Middleware Administering Oracle SOA Suite and Oracle Business Process Management Suite* guide.

Repeat Steps 2 to 4 to configure e-mail notification separately for each product family such as Oracle Fusion CRM, Oracle Fusion HCM, and so on.

7. Restart the Oracle WebLogic Server Managed Servers for the domains in the product families:

   a. Stop the Managed Servers by using one of the following scripts from the Oracle Fusion Applications Middleware home directory. In these scripts, `managed_server_name` specifies the name of the Managed Server and `admin_url` specifies the listen address and port number of the domain's administration server. The listen address is the host name, IP address, or domain name server (DNS) name. When prompted, enter the user name and password.

Platform	Script
UNIX	`FA_MW_HOME/user_projects/domains/domain_name/bin/stopManagedWebLogic.sh managed_server_name admin_url`

   b. Start the Oracle WebLogic Server Managed Servers for the product families using one of the following scripts from the fusionapps Middleware directory. In these scripts, `managed_server_name` specifies the name of the Managed Server and `admin_url` specifies the listen address (host name, IP address, or DNS name) and port number of the domain's administration server. When prompted, enter the user name and password.

Platform	Script
UNIX	`FA_MW_HOME/user_projects/domains/domain_name/bin/startManagedWebLogic.sh managed_server_name admin_url`

   For more information about performing administrative activities, see Perform Basic Administrative Tasks in the *Oracle Fusion Applications Administrator's Guide*.

8. Add the host name and address of the e-mail server to the `/etc/hosts` file on the server hosting the SOA managed servers where the drivers are running.

15.5 Create a Custom Index for SYSAUX Segments

Because the database audit trail feature is activated, it is recommended to create a custom index for audit segments on SYSAUX tables to improve the performance of any audit reporting that may occur. Skip this task if the Fusion Applications database is created using the Provisioning Wizard. If the Provisioning Wizard is not used to create the Fusion Applications database, perform this task.

Before creating a custom index, complete the task described in Moving an `AUDIT` segment from the `SYSTEM` to the SYSAUX Tablespace.

1. Login as a SYS user
2. Execute the following SQL statement:

```
create index sys.i_aud3 on sys.aud$(ntimestamp#) tablespace SYSAUX;
```

Depending on the audit reporting needs regarding the SYSAUX tables, it is recommended to review and adjust the custom index as meeded.

15.6 Next Steps

Review and complete the conditional common post-installation tasks to perform before proceeding to the product specific post-installation tasks. Go to Complete Conditional Common Post-Installation Tasks (page 16-1) to get started.

16

Complete Conditional Common Post-Installation Tasks

This section describes the conditional post-installation tasks that must be reviewed and completed as required.
After successfully completing the mandatory post-installation tasks, review and perform the following conditional tasks. Some components in the Oracle Fusion Applications environment are dependent on one another. Therefore, it is important to start and stop components in the proper order. In the course of normal Information Technology (IT) operations, common operations include shutting down computers and starting them back up. Therefore, it is crucial to start and stop Oracle Fusion Applications in a sequential manner.

- Set Up Global Search (page 16-2)
- Set Up Privacy Statement (page 16-8)
- Configure Oracle User Productivity Kit In-Application Support (page 16-8)
- Review and Configuring Diagnostic Logging Settings and Diagnostic Testing Features (page 16-10)
- Configure Oracle HTTP Server with Custom Certificates (page 16-20)
- Set Up Backup for Oracle Fusion Applications (page 16-22)
- Set up Oracle Enterprise Manager Cloud Control to Monitor and Manage Oracle Fusion Applications (page 16-22)
- Complete Conditional Oracle Identity Management Post-Installation Tasks (page 16-22)
- Install and Configuring Oracle Business Intelligence Applications (page 16-55)
- Configure Oracle Transactional Business Intelligence (page 16-55)
- Set Up Report Delivery Servers (page 16-55)
- Configure Oracle Data Integrator Studio (page 16-57)
- Set Up the Oracle Business Intelligence Administration Tool (page 16-58)
- Perform Optional Language Installations (page 16-58)
- Set Up Segregation of Duties (page 16-80)
- Configure Presence Servers (page 16-86)
- Configure Audit Trails for Oracle Fusion Middleware (page 16-88)
- Install Print Servers (page 16-90)
- Configure Oracle HTTP Server for Privileged Port (UNIX Only with No Load Balancer) (page 16-91)
- Use Default Oracle Database Vault Schemas (page 16-91)
- What to Do Next (page 16-91)

16.1 Set Up Global Search

Oracle Fusion Applications Search provides the search framework to manage enterprise-wide searches. Each product family within Oracle Fusion Applications such as Oracle Fusion Customer Relationship Management, Oracle Fusion Human Capital Management, and Oracle Fusion Supply Chain Management has its own set of seeded searchable objects that are packaged into its corresponding search application. For example, the seeded searchable objects for Oracle Fusion Customer Relationship Management such as leads, opportunities, and contacts are packaged in the Oracle Fusion Customer Relationship Management search application. To support the lifecycle management of searchable objects for a particular product family, provision the Oracle Fusion Applications environment.

This task is not applicable to Oracle Cloud implementations.

16.1.1 Oracle Fusion Applications Environment

Provisioning the Oracle Fusion Applications environment is mandatory before you can manage the searchable objects of any product family. See Provision a New Oracle Fusion Applications Environment (page 13-1).

16.1.2 Oracle Enterprise Crawl and Search Framework

Oracle Fusion Applications Search functionality is fundamentally made possible by the integration of three systems, each playing a role in forming the complete search platform:

- Oracle Fusion Applications Search leverages the Oracle Enterprise Crawl and Search Framework (ECSF) to enable search on transactional business objects. Therefore, validating the environment for Enterprise Crawl and Search Framework involves the recommended checks for establishing Oracle Fusion Applications Search. See Validate the Oracle Enterprise Crawl and Search Framework Environment (page 16-4).
- Managing search involves making seeded searchable objects available for search, maintaining search categories, and so on.
- To make the Oracle Fusion Applications search components appear on the user interface, enable the relevant profile option.

ECSF is an Oracle Fusion Middleware search framework that enables the exposure of application context information on various business objects to enable full-text transactional search. Benefits of ECSF include:

- Transparent integration of applications with search engines, which minimizes development time and maximizes the user experience with search
- Code reuse, through use of a well designed set of abstract classes, to reduce long design cycles
- Basic platform for developing search, which helps new developers to grasp the conceptual flow of work easily
- Centralized process and control mechanism, which enhances search functionality
- Wide range of optimizations that offer better control to leverage search results

16.1.2.1 Oracle Enterprise Crawl and Search Framework Management Features

ECSF management features include:

- Runtime server, a metadata-driven runtime engine that serves as an integration framework between enterprise data sources and Oracle Secure Enterprise Search (Oracle SES). It enables crawling, indexing, and the security service. It also serves as the semantic engine that provides "smart" search features, such as faceted navigation, actionable results, and related search.
- Oracle Enterprise Manager Fusion Applications Control (Fusion Applications Control), an administration user interface for configuring and administering the ECSF runtime server, managing the searchable object lifecycle, and synchronizing with Oracle SES. Support for a command line administration option is also provided. See ECSF Command Line Administration Utility in the *Oracle Fusion Applications Developer's Guide*.

16.1.2.2 Key Oracle Enterprise Crawl and Search Framework Features

Key ECSF features that are built on top of Oracle SES and enhance the Oracle Fusion Applications user experience with search include:

- Basic search, which allows query based on keyword and search category
- Advanced search, which allows query based on keyword, search category, and up to 100 attribute filters
- Faceted navigation, which allows the filtering of search results based on attributes of the business objects. Users can navigate a search result set based on a set of predefined facets, or dimensions. This feature returns a list of facets and their associated set of available values with the search result. Users can select a value for each facet, which is then submitted with the search query to narrow down the result set
- Actionable results, which are search results with action links associated with the searchable objects. From the search results users can either go straight to the page displaying the record they selected, or they can invoke a specific task on a search result
- Saved searches, which allows saved search criteria for later use. Users can create new saved search entries, edit and delete existing saved search entries, and retrieve user-specified or public saved search entries
- File attachments, which allow the crawling of attachments that are associated with Oracle Fusion Applications transactional objects or records
- Crawling Oracle WebCenter Portal tags, which supports crawling searchable objects that contain Oracle WebCenter Portal tags
- Crawling tree structures, which supports search functionality on source systems containing data that is organized in a tree structure (for example, Oracle Business Intelligence Catalog)
- Search support for external data sources, which allows querying against search groups that contain external data sources, which are non-ECSF related data sources, such as wiki pages and blogs, that are directly crawled by Oracle SES

16.1.3 Validate the Oracle Enterprise Crawl and Search Framework Environment

Before beginning to manage search with ECSF, make sure that the environment is set up properly for using ECSF.

To validate the ECSF setup, follow the procedures in the following sections.

Task 1 Make Sure That Oracle Fusion Applications Includes Search Functionality
Oracle Fusion Applications Search should be embedded within Oracle Fusion Applications, but it must be enabled in the user interface by setting the profile option `FUSION_APPS_SEARCH_ENABLED` to `Y`.
To make sure that Oracle Fusion Applications includes search functionality:

1. Log in to Oracle Fusion Applications. In case of any problems to log in to Oracle Fusion Applications, contact the installation team.
2. Verify that the **Enterprise Search** box is available at the top of every Oracle Fusion Applications page.
3. View the **Search Categories** dropdown list. There should be no search categories listed.
4. Log out.

Task 2 Make Sure That Oracle SES Is Installed and Configured Properly
Oracle SES provides the fundamental search capability that includes crawling, indexing, and querying. For more information about Oracle SES, see Introduction to Oracle Secure Enterprise Search in the *Oracle Secure Enterprise Search Administrator's Guide*.
To make sure that Oracle SES is installed and configured properly:

1. Check the administration endpoint by logging in to the Oracle SES Administration GUI with the administration username and password at the following URL.

   `http: host_name:7777/search/admin/index.jsp`

   The default port number is 7777. Make sure to use the correct port number for the installation. In case of any issues to access the Oracle SES search engine, contact the installation team.
2. Make sure that the Oracle SES identity plug-in has been registered.
3. Make sure that the federated trusted entities are created. Depending on what product families are installed, it should possible to see one to three proxy users listed. The valid values are:
   - `FUSION_APPS_CRM_ECSF_SEARCH_APPID`
   - `FUSION_APPS_FSCM_ECSF_SEARCH_APPID`
   - `FUSION_APPS_HCM_ECSF_SEARCH_APPID`

Task 3 Make Sure That Fusion Applications Control Is Available
Fusion Applications Control must be available for configuring and administering the ECSF runtime server, managing the searchable object lifecycle, and synchronizing with Oracle SES.

To make sure that Fusion Applications Control is available:

1. Log in to Oracle Enterprise Manager.
2. From the navigation pane, expand the farm and then the **Enterprise Crawl and Search Framework** folder.
3. Select the application engine instance that contains the searchable objects that are managed to open the Enterprise Crawl and Search Framework Configuration Settings page.

   The search engine types (Oracle SES) should be listed.
4. Click the Oracle SES search engine type name link in the Search Engine Types table to open the Search Engine Instance administration page, and validate the Oracle SES search engine instance parameters.
5. From the table of search engine instances, select a search engine instance record, and then select the **Searchable Objects** tab to view the table of searchable objects, and validate the list of searchable objects for the application. For a list of seeded searchable objects.
6. Select the **Search Categories** tab to view the table of search categories, and validate the list of search categories and objects associated with the search categories for the application. For a list of seeded search categories.
7. From the navigation pane, re-select the application to open the Enterprise Crawl and Search Framework Configuration Settings page, then click the **Search Application Service Component** link to open the Search Application Service Component administration page, and validate that the search applications for the product families are installed.

Task 4 Provide Access to ECSF Pages in Fusion Applications Control
To access the ECSF pages in Fusion Applications Control, users must have Operator privileges in Oracle WebLogic Server. Add the users to the Operator group and above on Oracle WebLogic Server.

Task 5 Validate the Application Identities
Oracle Fusion Applications include seven search-related application identities that are seeded and are stored in the identity store:

- `FUSION_APPS_CRM_SES_CRAWL_APPID`
- `FUSION_APPS_CRM_ECSF_SEARCH_APPID`
- `FUSION_APPS_FSCM_SES_CRAWL_APPID`
- `FUSION_APPS_FSCM_ECSF_SEARCH_APPID`
- `FUSION_APPS_HCM_SES_CRAWL_APPID`
- `FUSION_APPS_HCM_ECSF_SEARCH_APPID`
- `FUSION_APPS_ECSF_SES_ADMIN_APPID`

ECSF is powered by Oracle SES. To integrate with Oracle SES, several integration identities known as application identities are used. For each Oracle Fusion Applications application, there are a pair of application identities, for example, `FUSION_APPS_HCM_SES_CRAWL_APPID` and `FUSION_APPS_HCM_ECSF_SEARCH_APPID`. The `CRAWL` application identities are used by Oracle SES to interact with ECSF for crawling and security requests, while the `SEARCH` application identities are used by Oracle SES to query Oracle SES as proxy users.

`FUSION_APPS_ECSF_SES_ADMIN_APPID` is the application identity used by ECSF to integrate with Oracle SES for administration tasks, such as deployment, scheduling, and so on.
Application identities are provisioned as users in the Oracle Fusion Applications identity store. They often have high level privileges, and their credentials are generated and stored in the credential store. These users are used mainly for machine to machine (application to application) integration.
The Lightweight Directory Access Protocol (LDAP) credential store stores the passwords for the identities that Oracle Fusion Applications and ECSF uses to retrieve passwords for Oracle SES integration.
View the LDAP credential store to make sure the application identities exist.

16.1.4 Configure Help Search: Highlights

It is possible to include Help in the list of search categories for the search in the global area of Oracle Fusion Applications. This search is of type Oracle Fusion Applications Search, and administering this search involves tasks in Oracle Enterprise Crawl and Search Framework.

This task is not applicable to Oracle Cloud implementations.

The search in Oracle Fusion Applications Help and the navigators, for example Search by Business Process, are based on other search functionality and do not require configuration.

Oracle Enterprise Crawl and Search Framework administration is described fully in Understand Key Oracle Enterprise Crawl and Search Framework Features in the *Oracle Fusion Applications Administrator's Guide*. While reading content from that guide, keep in mind that Oracle Fusion Applications Search is not used only for Oracle Fusion Applications Help; therefore, the content is not specific to help.

16.1.5 Searchable Objects

- Deploy and activate the TopicSearchPVO searchable object, associate it with the Help category and deploy the category, and deploy and start index schedules. Each crawl picks up customizations and patches for help, so the frequency depends on how often you help is added, managed or patched.
- Do not modify the TopicSearchPVO searchable object itself.

16.1.6 Configure External Search Categories for Oracle Business Intelligence and Oracle WebCenter Portal: Procedures

To perform global search within Oracle Business Intelligence and Oracle WebCenter Portal, create the appropriate external search categories in Oracle Fusion Applications. For general instructions on making external search categories available for search, see Make External Search Categories Available for Federated Search in the *Oracle Fusion Applications Administrator's Guide*.

However, before proceeding with the configuration of external search categories for Oracle Business Intelligence and Oracle WebCenter Portal, create manually the Business Intelligence data source.

Perform the search-related configuration tasks using Oracle Enterprise Crawl and Search Framework. To configure external search categories for Oracle Business Intelligence and Oracle WebCenter Portal, follow these instructions.

1. Log in to Oracle Enterprise Manager Fusion Applications Control.
2. From the navigation pane, open **Farm** - **Enterprise Crawl and Search Framework** folder.
3. Select the application engine instance SES 11.2.1. It contains the searchable objects that are managed to open the Enterprise Crawl and Search Framework Configuration Settings page.
4. From the Search Engine Types table, click Oracle Fusion Application Search engine SES 11.2.1 to open the Search Engine Instance administration page.
5. On the External Search Categories tab, click **Import**.
6. In the Available Categories column, select the checkbox of the external search categories to be imported, and click **Move** to shuttle the selection to the Selected Categories column.
   - To import Oracle Business Intelligence, select bi_search
   - To import Oracle WebCenter Portal, select Collaboration
7. Click **OK** to import the selected external search categories.
8. Associate the Application ID with the imported external categories:
   - To associate with Oracle Business Intelligence, in the Application ID column corresponding to the imported external search category (bi_search), enter BI.
   - To associate with Oracle WebCenter Portal, in the Application ID column corresponding to the imported external search category (Collaboration), enter WC.
9. Click **Save External Search Category** to save the selected record.
10. Associate the Application ID with the Search Service component:
    a. From the navigation pane on the left side, select **Enterprise Crawl and Search Framework** folder. The Enterprise Crawl and Search Framework Settings page appears.
    b. From the context menu of **Enterprise Crawl and Search Framework**, select **Home**.
    c. Select the first active service component and note down the search engine instance that is associated with the active service component.
    d. In the `ECSF_QUERY_SERVICE_APP_IDS` field, enter the Application ID in comma separated string format:
    - To configure external search category for Business Intelligence, enter BI.
    - To configure external search category for Oracle WebCenter Portal, enter WC
11. Save the changes.
12. Restart the Search application from the WebLogic Server Console.

16.1.7 Make a Search Application Highly Available

Each installation of Oracle Fusion Applications can provision one or more offerings such as Oracle Fusion Customer Relationship Management (Oracle Fusion CRM), Oracle Fusion Human Capital Management (Oracle Fusion HCM), and so on. Each offering has its own search application such as CRM Search Application, HCM Search Application and so on. However, the application architecture restricts running only one search application at a time and only that search application is registered as the identity plug-in end point of Oracle Secure Enterprise Search (Oracle SES). The identity plug-in end point of Oracle SES is a critical part of Oracle Fusion Search and is used in authenticating all users using the search functionality. Therefore, to mitigate the risk of any down time, it is necessary to identify and make the registered search application highly available by adding more managed WebLogic servers to the cluster.

Depending on the provisioned offerings, the actual search application registered as the identity plug-in endpoint varies. The following instructions help identify the search application and add more managed WebLogic servers to the existing cluster.

1. Log in to the Oracle SES Administration page.
2. On the Global Settings tab, click **Identity Management Setup**. Review the protocol identified by the HTTP end point for authentication and the current search application indicated by one of the following values for User ID:
   - User ID = `FUSION_APPS_CRM_ECSF_SEARCH_APPID`: indicates CRM Search Application is used
   - User ID = `FUSION_APPS_FSCM_ECSF_SEARCH_APPID`: indicates FSCM Search Application is used
   - User ID = `FUSION_APPS_HCM_ECSF_SEARCH_APPID`: indicates HCM Search Application is used
3. Identify the search application and add more managed servers to the cluster.

16.2 Set Up Privacy Statement

The Privacy Statement link is disabled by default.

Enable the Privacy Statement link in the **About this Page** dialog available from the **Settings and Action**s menu and configure it to link to a customer-defined page by setting the `PRIVACY_PAGE` profile option value to a full URL. See About Setting and Accessing Profile Values in the *Oracle Fusion Applications Developer's Guide*.

16.3 Configure Oracle User Productivity Kit In-Application Support

This section describes the procedures for setting up the Oracle User Productivity Kit In-Application Support.

Users may need to access and take advantage of the Oracle User Productivity Kit (UPK) content while working with Oracle Fusion Applications. To make the Oracle UPK content available for users, enable and configure the UPK link under the **Settings and Actions** menu of Oracle Fusion Applications, using the Oracle UPK In-Application Support functionality.

To perform this task, have the role of a System Administrator and have relevant privileges on the environment where the UPK link is enabled and configured.

Configuring the Oracle UPK In-Application Support involves the following activities:

1. Registering Oracle UPK as an Enterprise Application.
2. Deploying the Oracle UPK package on a HTTP server.

16.3.1 Register Oracle UPK as an Enterprise Application

The system administrator must have security access to use Oracle Fusion Functional Setup Manager to complete the steps that follow.

To complete the configuration:

1. From the Oracle Fusion Applications home page, navigate to **Navigator**, **Tools**, **Setup and Maintenance** to access the Setup and Maintenance work area.
2. In the Tasks list, select **Topology Registration**, **Register Enterprise Applications** to access the Register Enterprise Applications work area.
3. In the **Register Enterprise Applications** work area, do one of the following:
   - To modify an existing configuration, click the **Name** link of the registered application.

     For example: Oracle User Productivity Kit
   - If this is a new configuration, click **Add (+)** to register Oracle UPK as a new application in Oracle Fusion Applications.
4. In the **Add Enterprise Application** work area, in the **Basic Information** section, do the following:
   a. In the **Enterprise Environment** drop-down list, select the environment.

      For example: Oracle

   b. In the **Enterprise Application** drop-down list, select the enterprise application.

      For example: Oracle User Productivity Kit

   c. In the **Name** field, enter the name of the enterprise application to be registered.

      For example: Oracle User Productivity Kit
5. In the **Server Details** section, do the following:
   a. In the **Server Protocol** drop-down list, select the appropriate protocol for the server that is planned to be used to launch UPK content.

      The UPK Player supports both HTTP and HTTPS.

   b. In the **External Server Host** field, enter the full DNS name of the server host.

      For example: content.mycompany.com

   c. In the **External Server Port** field, enter the appropriate port for either HTTP or HTTPS. It could be either the default value 80/443 or customer configured port location.

      The Context Root name is the name of the virtual directory used in the URL that launches the UPK content.

d. Click **Save and Close** when the process is done.

6. Click **Regenerate Domain Connections**.
7. Log out of Oracle Fusion Applications and log in again.
8. Click the **Settings and Actions** menu on the Oracle Fusion Applications Home page to verify if the Oracle User Productivity Kit is now available as a menu item.

16.3.2 Deploy the Oracle UPK Player Package

Deploy the Oracle UPK Player Package to any server that uses the HTTP or HTTPS protocols.

The content root directory must be configured to the location of the Oracle UPK Player on the web server.

For example: `http(s)://<server>:<port>/<directory>`

Test access to the content.

If the Oracle UPK Player launches with all topics, continue to Oracle Fusion Applications for In-Application Support.

16.4 Review and Configure Diagnostic Logging Settings and Diagnostic Testing Features

The infrastructure for health checking and troubleshooting Oracle Fusion Applications is provided along with provisioning. However, before beginning any production activity on Oracle Fusion Applications, perform the following configuration tasks.

This task is not applicable to Oracle Cloud implementations.

16.4.1 Configure Settings for Log Files During Normal Operation

Although critical business logic sections of Oracle Fusion Applications may write more information to log files than less critical areas of the application code, the amount of information that Oracle Fusion Applications log depends primarily on how the environment is configured. Oracle supplies default values for log settings, but different setting values can be specified to adjust the amount of information to be logged. Most Oracle Fusion Applications components use a standard set of log configuration settings.

In busy computing environments, the amount of disk space used by log files can become a concern. Large log files can also affect system performance. Oracle Fusion applications that are written in PL/SQL address this concern using automatic log file rotation.

16.4.1.1 Manage Rotating Log File Space Usage for PL/SQL Applications

For Oracle Fusion Applications modules that are implemented using PL/SQL, when a `diagnostic.log` file reaches a specific size, the `diagnostic.log` file is automatically renamed, and a new `diagnostic.log` file is created. If the `AFLOG_PLSQL_FILENAME` profile option is set so that the logging framework uses a log file name other than

diagnostic.log, then the file name that the profile option specifies is used, instead of diagnostic.log.

Use the following profile options settings to specify the maximum log file size:

(KSQ: revisit this section: is ordered list procedure needed? Looks like FAC for profile option changing, yes?)

- AFLOG_MAX_FILE_SIZE: This setting specifies the size in megabytes beyond which a PL/SQL log file name is automatically renamed and a new log file is started. The default value is 10 megabytes.

  If the AFLOG_BUFFER_MODE profile option is set to a value larger than 0, enabling asynchronous buffering of PL/SQL log entries, then the actual maximum size of any single PL/SQL log file is the value of AFLOG_MAX_FILE_SIZE plus the number of megabytes that are flushed from the buffer. This value is approximate, because the amount of information that can accumulate in the buffer is set using the AFLOG_BUFFER_SIZE setting, which specifies a specific number of log records, rather than a specific number of megabytes.

- AFLOG_NUMBER_OF_LOG_FILES: This setting specifies the maximum number of PL/SQL log files the system keeps at any one time. The default value is 10 files.

PL/SQL log rotation is currently done only on the basis of file size, not on the basis of the passage of a specified amount of time.

When a PL/SQL log file is renamed, the new name depends on whether the AFLOG_PLSQL_FILENAME profile option is set:

- If the profile option is set, then the new log file name is of the format *AFLOG_PLSQL_FILENAME_value*-*n*.log, where *n* is a positive integer.
- If the profile option is not set, then the new log file name is of the format diagnostic-*n*.log, where *n* is a positive integer.

The value of *n* depends on the names of the log files that are already present in the directory. If the directory contains no previously renamed log files, then the first renamed log file is called diagnostic-1.log or *AFLOG_PLSQL_FILENAME_value-1*.log. If other log files exist, then *n* is set to the next higher integer after the highest integer that is already in use. For example, if the directory contains diagnostic-1.log through diagnostic-8.log at the time when the diagnostic.log file surpasses the size limit set in the AFLOG_MAX_FILE_SIZE profile option, then the diagnostic.log file is renamed to diagnostic-9.log.

When the number of log files reaches the value specified using the AFLOG_NUMBER_OF_LOG_FILES profile option, then older log files are deleted automatically, to prevent the disk space usage of the log file directory from getting too large.

Over time, the value of *n* in diagnostic-*n*.log or *AFLOG_PLSQL_FILENAME_value*-*n*.log can become large enough to cause usability challenges or exceed the number of characters that the operating system allows in a file name. To have the value of *n* start over at 1, move all existing log files except the currently active diagnostic.log file or *AFLOG_PLSQL_FILENAME_value*.log file into another directory. When the active file surpasses the size limit and the log rotation code finds no previously renamed log files in the directory, the active file is renamed using a value of 1 for *n*.

If the Oracle Fusion Applications environment includes multiple database nodes such as Oracle Real Application Clusters (RAC), then each database node corresponds to a server instance that has its own location for log files.

If an incident is created, then the server instance that creates the incident handles all subsequent jobs related to that incident. Identifiers for incidents are unique within a specific instance, but not across instances. For more information about working with incidents, see Prepare to Troubleshoot Using Incidents, Logs, QuickTrace, and Diagnostic Tests in the *Oracle Fusion Applications Administrator's Guide*.

(KSQ: consider moving this info to the troubleshooting chapter, since it seems more useful for troubleshooting than normal operation?)

16.4.1.2 Manage Log File Space Usage for C Applications

Oracle Fusion Applications modules that are implemented in C currently produce log files that continually increase in size.

Writer note: PM says it's very important to include this section, despite not seeing a corresponding section in the FMW Admin Guide that Thomas K. designated as a model for this book, because Oracle Fusion Applications that are implemented in C do not have a log management facility.

To manage log file space usage for log files created by Oracle Fusion Applications modules that are written in C:

1. Navigate to the directory that contains the log files:
   - If the `AFLOG_FILENAME` profile option is set, then navigate to the location designated by the profile option value.
   - If the `AFLOG_FILENAME` profile option is not set, then navigate to the location set by Oracle Enterprise Scheduler Service.

     Use Fusion Applications Control to determine the location of Oracle Enterprise Scheduler log files, as follows:

     a. In the navigation pane, expand the farm part of the navigational tree, then expand **Scheduling Services**, and then select an Oracle Enterprise Scheduler server as the target.

     b. In the context pane, from the **Scheduling Service** dropdown menu, choose **Logs**, **View Log Messages.**

     c. Click **Target Log Files** to view a list of log files associated with the selected server.

        For example, a typical path and file name might be the following, where *`APPLICATIONS_CONFIG/domain/<domain_name>`* is the domain home directory, *`SERVER_HOME`* is the server home directory, and *`serverName`* is the name of the Oracle Enterprise Scheduler server:

        `APPLICATIONS_CONFIG/domain/<domain_name>``/servers/`*`SERVER_HOME`*`/logs/`*`serverName`*`-diagnostic.log`

        (REVIEWER: Correct? On the PRC system where I saw this on 02/10/11, `http://`*`example.country`*`.oracle.com:8201/em,` where *`example.country`* was `adcdbc13.us,` there were also ESS log file names in the format *`serverName.`*`log` and *`serverName.`*`log0000n,` but the downloaded files

with `diagnostic` in the file name were the ones that referred to the product such as PRC or PRJ.)

2. Rename the log file that is currently in use.

   For example, if the current log file is called `Cdiagnostic.log`, it might be renamed to `Cdiagnostic_`*`MMDDYYYY`*`.log`, where *`MMDDYYYY`* is the current date.

3. Delete any previously renamed log files that are no longer need.

16.4.2 Understand Oracle Fusion Applications Diagnostic Tests and the Diagnostic Framework

Incidents are collections of information about error conditions. It is strongly recommended to follow Information Technology Infrastructure Library (ITIL) best practices by establishing a help desk or service desk within the organization to support Oracle Fusion Applications, and have the help desk personnel use incidents to track the troubleshooting and resolution of all problems. Some incidents are created and gather information automatically when problems occur. For example, the information associated with an automatically created incident may include detailed operational information collected by the QuickTrace (in-memory logging) feature for Oracle Fusion Applications. For problems that do not automatically create incidents, administrators or help desk personnel can manually create incidents and manually gather and add related system information.

Log files contain information about both normal and problematic events. Log files can help both to monitor normal operations and to diagnose and address some problems. For example, log messages that state that a service cannot be reached might indicate a hardware failure. If r a more complex issue is discovered, then Oracle Support personnel may use log files to trace the execution code paths of relevant requests, as part of diagnosing the problem. Log files are particularly helpful if the Oracle implementation contains custom code that needs debugging, especially when using a debugger is not feasible, such as on a production system.

The **QuickTrace** (in-memory logging) feature continuously records a specified level of log detail in an area of memory. The memory is recycled on an ongoing basis, with the oldest information being deleted or overwritten first. Because QuickTrace writes to memory instead of to a log file, it can gather operational information continuously without significantly affecting system performance. The information that QuickTrace stores in memory is written to disk only when an incident occurs or when an administrator manually dumps the contents of a QuickTrace buffer.

Diagnostic tests are executables that are designed to exercise particular aspects of Oracle Fusion applications, to determine whether they are operating correctly and to help identify and resolve any problems. The Oracle Fusion Applications Diagnostic Testing Framework (Diagnostic Testing Framework) lets execute diagnostic tests and collects the results into detailed diagnostic reports. Oracle provides diagnostics tests that are installed along with Oracle Fusion Applications releases and patches.

Use diagnostic tests along with information from log files and the collections of error condition information that are called incidents.

In Cloud Control, **Support Workbench** helps investigate, report, and resolve problems (critical errors). Use Support Workbench to perform the following kinds of operations:

- View summary information about recent problems and incidents
- View detailed diagnostic data that was gathered automatically

- Manually trigger additional dumps of diagnostic data
- Connect to the Oracle Fusion Applications Diagnostic Dashboard (Diagnostic Dashboard), which provides additional diagnostic tests that can be run
- Create or update service requests with Oracle Support, including uploading diagnostic data to Oracle

16.4.2.1 Relationships Between Diagnostic Tests, Incidents, and Log Messages

Oracle developers create diagnostic tests that can be used to help diagnose and resolve Oracle Fusion application problems.

Oracle developers use mechanisms such as application programming interface (API) calls in Oracle Fusion Applications code to record application operations in log files and to provide error messages as appropriate. A diagnostic test may or may not be associated with a particular error message.

If an Oracle Fusion application handles a particular error in a way that triggers the creation of an incident, then any diagnostic tests that are associated with the error message for the incident run automatically. Oracle developers accomplish this by setting the value of each diagnostic test's `APPS_MSG_ID` tag to match the identifier of any error message that should trigger the automatic execution of that test. There is no configuration setting for disabling this automatic execution of diagnostic tests.

The results of any automatically run diagnostic test are automatically associated with the related incident, and the identity of the user who received the error message is recorded.

For more information about using diagnostic tests and log files to help diagnose a problem, see Prepare to Troubleshoot Using Incidents, Logs, QuickTrace, and Diagnostic Tests in the *Oracle Fusion Applications Administrator's Guide*.

It is important to be familiar with the following additional concept that **Seed data** is information that Oracle provides in the form of database records. Diagnostic tests are included in seed data.

16.4.2.2 Standard Diagnostic Testing Administration Tasks and Tools

Under normal circumstances, the following administrative tasks are associated with Oracle Fusion Applications diagnostic tests:

- Configuring security to provide appropriate access to diagnostic tests. Job roles can be assigned to particular users to grant those users the ability to perform various diagnostic operations.

  In the current release, a job role for diagnostic operations grants the user the ability to perform the specified operations for all diagnostic tests that are provided with Oracle Fusion Applications. When choosing whether to grant a diagnostic job role to specific users, be aware that some diagnostic tests may include sensitive information in their results.

  (Writer note: this information is current as of early December 2010. Depending on technical and scheduling constraints, future releases may or may not add the ability to control access to individual diagnostic tests.
- Running diagnostic tests. Diagnostic tests can be used for the following purposes:
  - Routinely checking the health of the Oracle Fusion applications

  - Troubleshooting a problem with an Oracle Fusion application
  - Collecting detailed data that may help Oracle Support to resolve a problem

Some diagnostic tests require a specific Oracle Fusion application to be running while the test is performed—these diagnostic tests are called **internal** diagnostic tests. Other diagnostic tests can perform their functions even if the Oracle Fusion application to be tested is not running—these tests are called **external** diagnostic tests.

(Writer note: PM says customer administrators do not need to know the technical differences between what internal means for Java tests and what it means for PL/SQL tests. I.e., a Java internal diagnostic test reuses or refers to code modules, entity objects, or view objects from a Fusion application, but a PL/SQL internal diagnostic test runs using the data security context of the Fusion application.)

The distinction between internal and external tests is important because it affects both when the tests can be run and which interfaces can be used to run the tests. The Diagnostic Testing Framework provides two interfaces:

- The Oracle Fusion Applications Diagnostic Dashboard application (Diagnostic Dashboard) provides a graphical user interface that allows to perform the following tasks:
  - Execute and monitor both internal and external diagnostic tests for Oracle Fusion applications
  - Purge diagnostic test results
  - Register any special-purpose diagnostic tests that Oracle Support may provide
  - Work with categorization tags to keep the diagnostic tests organized

    (Writer note: references to custom tags hidden for v1 per PM request, as we do not yet have a supported migration path for custom tags.)
- The `diagctl` command-line interface allows to perform the following tasks:
  - Execute external diagnostic tests (tests that do not require a specific Oracle Fusion application to be running)

    Technical constraints prevent the `diagctl` command-line interface from returning useful results for internal diagnostic tests (tests that require a specific Oracle Fusion application to be running when the test is performed). Use Diagnostic Dashboard to run any internal diagnostic tests.

    Use also Diagnostic Dashboard to determine whether a particular test is an internal or an external test.
  - View diagnostic test results
  - Register any special-purpose diagnostic tests that Oracle Support may provide

16.4.3 Configure the Diagnostic Testing Framework for Normal Operation

Diagnostic tests can be used to check normal system health and to troubleshoot system problems. The Oracle Fusion Applications environment can be configured to run all Oracle Fusion Applications diagnostic tests using the Diagnostic Dashboard application, and to run external diagnostic tests using the `diagctl` command-line interface.

Technical constraints prevent the `diagctl` command-line interface from returning useful results for internal diagnostic tests (tests that require a specific Oracle Fusion application to be running when the test is performed). Use Diagnostic Dashboard to run any internal diagnostic tests.

Use also Diagnostic Dashboard to determine whether a particular test is an internal or an external test.

Both the Diagnostic Dashboard application and the `diagctl` command-line interface are automatically installed as part of the Oracle Fusion Applications installation. However, assign appropriate job roles to specific users to give them the ability to display and perform operations using the Diagnostic Dashboard application. Access to the `diagctl` command-line interface is controlled at the level of the server operating system.

For proper operation of the `diagctl` command-line interface, set also certain environment variables.

To help to locate diagnostic tests for specific purposes, the diagnostic tests that are received with Oracle Fusion applications are all assigned to predefined categories.

(Writer note: references to custom tags hidden for v1 per PM request, as we do not yet have a supported migration path for custom tags.)

If preferred, define also custom categories and use categorization tags to assign tests to the custom categories.

The custom categories to which the diagnostic tests are assigned can be changed, and the custom categorization tags and tag values from the database can be removed.

The tag name and tag value assignments that Oracle uses to categorize diagnostic tests cannot be changed, and those tag names or tag values from the database cannot be removed. The following related links in the Task pane of the Diagnostic Dashboard application are intended for use by Oracle personnel only:

- Add New Tag
- Add New Tag Value
- Assign Tags to Tests
- Unassign Tags from Tests
- Remove Tag
- Remove Tag Value

WARNING: Do not attempt to modify the diagnostic test seed data provided by Oracle. Unauthorized modification of this seed data may prevent diagnostic tests from functioning correctly, lengthening the amount of time required to resolve both current and future problems.

16.4.3.1 Control Access to Diagnostic Testing Functionality

Access to diagnostic testing functionality is controlled separately for Diagnostic Dashboard and the `diagctl` command-line interface.

For the `diagctl` command-line interface, access is controlled at the level of the server operating system. If a user can log in to the server where `diagctl` is stored, and if that user has operating system permissions to read and execute `diagctl`, then that user

can use `diagctl` to perform all diagnostic operations that the command-line interface supports.

For Diagnostic Dashboard, Oracle Identity Manager can be used to assign specific users to any of the four preconfigured job roles that grant users access to Diagnostic Dashboard. Each of these four job roles provides access to a different amount of the functionality of the dashboard.

Oracle Fusion Applications display the **Troubleshooting**, **Run Diagnostic Tests** command in the **Settings and Actions menu** only for users who are associated with the preconfigured job roles that grant access to Diagnostic Dashboard operations.

- The `Diagnostic Viewer` job role can view and analyze diagnostic test results for Oracle Fusion applications.
- The `Diagnostic Regular User` job role can execute diagnostic test runs and view diagnostic test results for Oracle Fusion applications, and cancel diagnostic test runs that were started by the current user.
- The `Diagnostic Advanced User` job role can schedule and execute diagnostic test runs, view diagnostic test results, attach test results to application incidents for Oracle Fusion applications, and cancel diagnostic test runs that were started by the current user. In general, this job role is recommended for running Oracle Fusion Applications diagnostic tests, because its added capabilities allow users to work with administrators more flexibly during troubleshooting.
- The `Diagnostic Administrator` job role can use all of the diagnostic testing functionality provided for Oracle Fusion applications, including purging test results from the database and canceling test runs started by other users.

In the current release, any job role for diagnostic operations grants the user the ability to perform the role's specified operations for all diagnostic tests that are provided with Oracle Fusion applications. When choosing whether to grant any diagnostic job role to specific users, be aware that some diagnostic tests may include sensitive information in their results.

To grant specific users permission to use Diagnostic Dashboard:

1. Decide which users need the capabilities of each of the four preconfigured job roles for diagnostic operations.
2. Use Oracle Identity Manager to assign the appropriate job role to each user.
3. For each external role that was created or found in Step 2, use Oracle Authorization Policy Manager to map the external role to the specific diagnostic duty role that allows the needed operations.

16.4.3.2 Navigate to the Diagnostic Dashboard Application

The Diagnostic Dashboard application for Oracle Fusion Applications provides a graphical user interface that lets execute and monitor diagnostic tests, display and purge test results, and register any special-purpose diagnostic tests that Oracle Support may provide. Each product family within Oracle Fusion Applications has its own instance of Diagnostic Dashboard. Provided that an appropriate job role is assigned, navigate to Diagnostic Dashboard from any Oracle Fusion application or from Oracle Enterprise Manager Cloud Control (Cloud Control).

(Writer note: paragraph above also referred to the dashboard letting the customer "work with categorization tags to keep the diagnostic tests organized," but this text

is currently hidden as it implies custom tag capability, which is not planned to be supported in v1).

16.4.3.2.1 Navigate to the Diagnostic Dashboard Application from an Oracle Fusion Application

To use Diagnostic Dashboard to execute or monitor diagnostic tests or display or purge test results while using an Oracle Fusion application, navigate to Diagnostic Dashboard directly from the application.

To display the Diagnostic Dashboard application from an Oracle Fusion application:

1. Log in to the relevant Oracle Fusion application as a user who has access to the specific Diagnostic Dashboard operations that are needed.
2. From the **Settings and Actions** menu in the application, choose **Troubleshooting**, **Run Diagnostic Tests** to display Diagnostic Dashboard.

   Oracle Fusion applications display the **Troubleshooting**, **Run Diagnostic Tests** command in the **Settings and Actions** menu only for users who are assigned to the preconfigured jobs roles that grant access to Diagnostic Dashboard operations.

16.4.3.2.2 Navigate to the Diagnostic Dashboard Application from Cloud Control

To use the Diagnostic Dashboard application to execute or monitor diagnostic tests or display or purge test results while using Cloud Control, such as while using Support Workbench to gather additional information about an existing incident, navigate to Diagnostic Dashboard directly from Cloud Control.

To display to Diagnostic Dashboard from Cloud Control:

1. In Oracle Enterprise Manager, select the product family or cluster application for which diagnostic tests are run or diagnostic test results are viewed.
2. From the dynamic dropdown menu, choose **Diagnostics**, **Fusion Applications Diagnostic Dashboard**.

   A login screen for Diagnostic Dashboard appears in a new window.
3. Log in using an account for the Oracle Fusion Applications product family to be tested.

   The account used must also be assigned to a job role that provides access to Diagnostic Dashboard.

16.4.3.2.3 Configure Required Variables for the diagctl Command Line Interface

To operate properly, the `diagctl` command-line interface requires to set certain environment variables.

Set the required environment variables for each session that plans to use the `diagctl` command-line interface. For more convenience, the commands that define these variables may be added to the `.profile` or `.bashrc` files of all users who will run `diagctl`.

To set environment variables for a user of the `diagctl` command-line interface:

1. Log in to the operating system of the Administration Server of the Common domain.
2. Use a command such as the following to set the `DIAGJPSCONFIGFILE` environment variable to the location of the `jps-config-jse.xml` file, making these substitutions:

   Replace *`APPLICATIONS_CONFIG`* with the location of the top-level directory of Oracle Fusion Applications configuration files.

   Replace *`primordial_host_name`* with the host name of the Administration Server of the Common domain).

   ```
   UNIX: export DIAGJPSCONFIGFILE=APPLICATIONS_CONFIG/domains/
   primordial_host_name/CommonDomain/config/fmwconfig/jps-config-jse.xml
   ```

   Command syntax for UNIX environments may vary depending on which shell are used. Whenever an environment variable is defined, use the command syntax for the chosen shell.

   (REVIEWER: FYI, *APPLICATIONS_CONFIG* represents a placeholder, in this step, rather than an environment variable.)

   (Writer note: Since the correct syntax for setting UNIX environment variables depends on the customer's shell, and since OC said Bourne/Bash are what he typically sees, I'm using B/B syntax and keeping this hidden text for my future reference.)

   - *variablename=path* (Korn shell syntax)
   - export *variablename=path* (Bourne shell syntax and LINUX bash shell)
   - setenv *variablename path* (C shell syntax)
3. Use a command such as the following to set the `JAVA_HOME` environment variable to the location of the directory that contains Java files, where *`APPLICATIONS_BASE`* is the top-level directory for the Oracle Fusion Applications binaries.

   ```
   UNIX: export JAVA_HOME=APPLICATIONS_BASE/fusionapps/jdk
   ```
4. Use a command such as the following to set the `MW_HOME` environment variable to the location of the directory that contains Oracle Fusion Middleware files.

   ```
   UNIX: export MW_HOME=APPLICATIONS_BASE/fusionapps
   ```

   After completing this step, use the `diagctl` command-line interface to run diagnostic tests.

16.4.4 Health Checking and Diagnostic Tasks

Only after ensuring the completeness of the following configuration, perform health checking and troubleshooting for Oracle Fusion applications using log files, incidents, diagnostic tests and so on. See Perform System Maintenance Tasks and Prepare to Troubleshoot Using Incidents, Logs, QuickTrace, and Diagnostic Tests in the *Oracle Fusion Applications Administrator's Guide*.

16.4.5 Configuration Tasks

The following configuration tasks can be performed:

- Enable viewing of logs generated by C and PL/SQL. See Configuring Access to Logs for Fusion Applications Control in the *Oracle Fusion Applications Administrator's Guide*.
- Configure log file rotation. See Configuring Log File Rotation in the *Oracle Fusion Middleware Administrator's Guide*.
- Review default logging profile options and adjust values for specific requirements. See Default System Log Settings and Configure Standard Fusion Applications Log Settings for Troubleshooting in the *Oracle Fusion Applications Administrator's Guide*.
- Review and adjust the QuickTrace settings. See Default System Settings for Incident Creation in the *Oracle Fusion Applications Administrator's Guide*.
- Configure user access to diagnostic testing functionality. See Configure Access to the Diagnostic Dashboard in the *Oracle Fusion Applications Administrator's Guide*.
- Configure a job role for future user access to troubleshooting options. See Assist Users in Gathering Data Using Troubleshooting Options in the *Oracle Fusion Applications Administrator's Guide*.
- To benefit from the health checking, patching recommendations, and configuration services offered by My Oracle Support, install and configure Oracle Configuration Manager. See Install Configuration Manager on My Oracle Support.
- To use the latest troubleshooting features, including a purpose built Oracle Fusion Applications module, provided by Remote Diagnostic Agent (RDA), install and configure RDA. See the RDA Documentation on My Oracle Support.

16.5 Configure Oracle HTTP Server with Custom Certificates

If Simple topology is implemented, SSLterminates at OHS. Provisioning configures OHS with a default dummy certificate. As the dummy certificate is not trusted by browsers, certificate warning messages are displayed when accessing any external URL.

To avoid this, configure OHS to use certificate(s) signed by a trusted certificate authority (CA). It can be an external certificate authority such as Verisign, or an internal certificate authority whose root certificate is trusted by the browser.

Generate a certificate signing request and obtain signed certificate(s) and import these certificate(s) into wallet(s). There are two options for choosing certificate(s) and the OHS configuration is different based on the chosen option.

16.5.1 Option 1

Obtain a wildcard or Subject Alternative Name (SAN) certificate. A single wildcard certificate can protect all sub-domains at the same level (for example, *.mycompany.com can be used for both fin.mycompany.com and prj.mycompany.com). A SAN certificate can protect various domains mentioned in the Subject Alternative Name field.

- Import a single certificate (SAN or wildcard) into the wallet. Wallet location is specified using SSLWallet directive in `${ORACLE_INSTANCE}/config/$`

`{COMPONENT_TYPE}/${COMPONENT_NAME}/FusionSSL.conf` and by default points to the directory containing the default wallet.

- To specify the wallet containing the signed certificate, comment the existing SSLWallet directive and add a new line which points to the directory containing the wallet you have created, for example: SSLWallet "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/myWallet

16.5.2 Option 2

Obtain a separate server certificate for all external URLs. Procure up to 10 certificates, one for each external URL. This number varies depending on the selected offerings to provision.

1. Create a separate wallet for each certificate and import the certificates into them, since a wallet can only hold a single server certificate.
2. Copy `FusionSSL.conf` into separate files, one for each certificate (for example, `FusionSSL_fin.conf`, `FusionSSL_hcm.conf`, and so on).
3. Edit the individual `FusionSSL_<product>.conf` and edit SSLWallet directive to point to the directory containing the wallet that is created, for example,

   ```
   FusionSSL_hcm.conf -> SSLWallet "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/keystores/hcm
   ```

4. Specify the modified SSL configuration files in external Virtual Hosts defined in the `FusionVirtualHost_<product>.conf` files present in the `${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}` directory.

   By default, all VirtualHost entries for external URLs point to a single `FusionSSL.conf` file. Edit this line in each file to point to the respective `FusionSSL_<product>.conf` file.

   For example, change the fragment as follows:

   #External virtual host for hcm

   ```
   <VirtualHost hcm.mycompany.com:10620>

   ServerName https://hcm.mycompany.com:10620

   include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/FusionSSL.conf"
   ```

   to

   #External virtual host for hcm

   ```
   <VirtualHost hcm.mycompany.com:10620>

   ServerName https://hcm.mycompany.com:10620

   # include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/FusionSSL.conf"

   include "${ORACLE_INSTANCE}/config/${COMPONENT_TYPE}/${COMPONENT_NAME}/FusionSSL_hcm.conf"
   ```

After making all the necessary changes, restart OHS.

For more information about generating wallets, see Managing Keystores, Wallets, and Certificates in the *Oracle Fusion Middleware Administering Oracle Fusion Middleware* guide.

16.6 Set Up Backup for Oracle Fusion Applications

If there is an Enterprise Manager Cloud Control and it is intended to be used for backing up and restoring Oracle Fusion Applications, set it up before performing the initial backup. Follow the instructions detailed in Prerequisites for Using Cloud Control to Back Up or Restore the Environment in the *Oracle Fusion Applications Administrator's Guide*.

If Enterprise Manager Cloud Control is not intended to be used, perform backup and restore using operating system commands or third party tools to back up the Oracle Fusion Applications and Oracle Identity Management file systems, as well as database tools to back up the databases.

Ensure to perform a full backup either immediately or when the remaining post-installation tasks have been completed. See Perform a Backup in the *Oracle Fusion Applications Administrator's Guide* for instructions on how to perform a backup using Enterprise Manager Cloud Control or command line.

16.7 Set up Oracle Enterprise Manager Cloud Control to Monitor and Manage Oracle Fusion Applications

Oracle Enterprise Manager Cloud Control (Cloud Control) is a system management software that delivers centralized monitoring, administration, and life cycle management functionality for the complete Oracle Fusion Applications IT infrastructure from one single console. For example, monitor all the Oracle WebLogic Server domains for all the product families from one console.

For information about how to install Cloud Control, see Overview of Enterprise Manager Cloud Control in the *Oracle Enterprise Manager Cloud Control Basic Installation Guide* and Understanding the Basics of Enterprise Manager Cloud Control Installation in the *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide* .

16.8 Complete Conditional Oracle Identity Management Post-Installation Tasks

Review and complete the conditional Oracle Identity Management Post-Installation tasks described in this section.

16.8.1 Post-Provisioning Steps for Oracle Access Manager

Perform the tasks in the following sections:

- Update Existing WebGate Agents (page 16-23)
- Update WebGate Configuration (page 16-23)

The Oracle Identity Management Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27).

16.8.1.1 Update Existing WebGate Agents

Update the OAM Security Model of all WebGate profiles, with the exception of Webgate_IDM and Webgate_IDM_11g, which should already be set

To do this, perform the following steps:

1. Log in to the Oracle Access Manager Console as the Oracle Access Manager administration user.
2. Click the **System Configuration** tab.
3. Expand **Access Manager Settings - SSO Agents**.
4. Click the **Agents** icon.
5. In the Search window, click **Search**.
6. Click an Agent, for example: **IAMSuiteAgent**.
7. Set the **Security** radio button to OAM Transfer mode in the **OAM Configuration** screen of the Oracle Identity Management Provisioning Wizard, as described in Create an Oracle Identity Management Provisioning Profile (page 10-2).

   Click **Apply**.
8. Restart the managed servers WLS_OAM1 and WLS_OAM2 as described in Start and Stop Components (page 10-26).

16.8.1.2 Update WebGate Configuration

To update the maximum number of WebGate connections, proceed as follows.

1. In the Oracle Access Manager Console, click the **Agents** icon.
2. On the displayed search page, click **Search** to perform an empty search.
3. Click the Agent **Webgate_IDM_11g**.
4. In the **User Defined Parameters** box, set `client_request_retry_attempts` to 11.
5. If the following Logout URLs are not listed, add them:
   - `/oamsso/logout.html`
   - `/console/jsp/common/logout.jsp`
   - `/em/targetauth/emaslogout.jsp`
6. Click **Apply**.
7. Repeat Steps 5 and 6 for the following agents: OraFusionApp_11AG and OSN_Agent (if it exists).

16.8.2 Configure Oracle Identity Federation

This section is not applicable for the Single Host topology or when all Oracle Identity Management products are installed on the same host.

The Oracle Identity Management provisioning tools create, but do not start, Oracle Identity Federation. This section explains how to enable Oracle Identity Federation after provisioning has completed.Oracle Identity Federation is an optional component. If Oracle Identity Federation is not intended to be used, skip this section. This section

describes how to extend the Oracle Identity Management domain to include Oracle Identity Federation in an enterprise deployment.

This section contains the following topics:

- Start Oracle Identity Federation Managed Servers (page 16-24)
- Validate Oracle Identity Federation (page 16-24)
- Configure the Enterprise Manager Agents (page 16-25)
- Enable and Disable Oracle Identity Federation (page 16-25)

16.8.2.1 Start Oracle Identity Federation Managed Servers

Do the following to start the managed servers wls_oif1 and wls_oif2:

1. Run `stopall.sh` in Linux as described in Start and Stop Components (page 10-26).
2. Edit the `oif_startup.conf` file to automatically start Oracle Identity Federation. This file is located in the directory: *`IDM_CONFIG`*`/scripts`.

```
#
# OIF is enabled OOTB for Shared IDM
#
# OIF_ENABLED indicates whether or not OIF should be started/stopped
# as part of the startoif.sh/stopoif.sh scripts. Valid values are true or
false
# If false, the OIF will not be started or stopped
OIF_ENABLED=true
# OPMN_EMAGENT_MANAGED_BY_OIF_SCRIPT indicates whether or not OPMN and
# the EMAgent components for the OIM domain should be started, when OIF is
enabled.
# Valid values are true or false. If false, OPMN and the EMAgent components
will not
# be started or stopped when OIF is enabled.
# If OIF is disabled, OPMN and the EMAgent components will not be started or
stopped
OPMN_EMAGENT_MANAGED_BY_OIF_SCRIPT=true
```

   Save the file.
3. Run `startall.sh` in Linux as described in Starting and Stopping Components (page 10-26).

16.8.2.2 Validate Oracle Identity Federation

Validate the configuration of Oracle Identity Federation on IDMHOST1 and IDMHOST2 by accessing the Service Provider (SP) metadata on each host.

1. On IDMHOST1, access the SP metadata by going to:

   `http://IDMHOST1.mycompany.com:14100/oamfed/sp/metadata`
2. On IDMHOST2, access the SP metadata by going to:

   `http://IDMHOST2.mycompany.com:14100/oamfed/sp/metadata`

If the configuration is correct, access the following URL from a web browser:

`https://SSO.mycompany.com/oamfed/sp/metadata`

Metadata should be shown.

16.8.2.3 Configure the Enterprise Manager Agents

All the Oracle Fusion Middleware components deployed in this enterprise deployment are managed by using Oracle Enterprise Manager Fusion Middleware Control. To manage Oracle Identity Federation with this tool, configure the EM agents with the correct monitoring credentials. Update the credentials for the EM agents associated with IDMHOST1 and IDMHOST2. Follow these steps to complete this task:

1. Use a web browser to access Oracle Enterprise Manager Fusion Middleware Control at `http://ADMINVHN.mycompany.com:7001/em`. Log in as the WebLogic user.
2. From the Domain Home Page, navigate to the Agent-Monitored Targets page using the menu under **Farm**, then **Agent-Monitored Targets**.
    a. Click the **Configure** link for the Target Type Identity Federation Server to go to the Configure Target Page.
    b. On the Configure Target Page, click **Change Agent** and choose the correct agent for the host.

       When unsure about which agent to update, execute the command:

       ```
       OAM_ORACLE_INSTANCE/EMAGENT/EMAGENT/bin/emctl status agent
       ```

    c. Update the **WebLogic monitoring user name** and the **WebLogic monitoring password**. Enter `weblogic_idm` as the WebLogic monitoring user name and the password for the weblogic user as the WebLogic monitoring password.
    d. Click **OK** to save changes.

16.8.2.4 Enable and Disable Oracle Identity Federation

In Service Provider (SP) mode, Oracle Access Manager delegates user authentication to Oracle Identity Federation, which uses the Federation Oracle Single Sign-On protocol with a remote Identity Provider. Once the Federation Oracle Single Sign-On flow is performed, Oracle Identity Federation will create a local session and then propagates the authentication state to Oracle Access Manager, which maintains the session information.

This section provides the steps to integrate Oracle Identity Federation with Oracle Identity Manager in authentication mode and SP mode.

MANDATORY: Federation Trust must be established prior to enabling Oracle Identity Federation.

This section contains the following topics:

- Enable Oracle Identity Federation (page 16-25)
- Disable Oracle Identity Federation (page 16-26)

16.8.2.4.1 Enable Oracle Identity Federation

This section describes how to switch the authentication of the Oracle Access Manager security domain from local authentication to Federation SSO.

Perform the following operations to switch from local authentication to Federation SSO for Browser Based Schemes:

1. In a browser, go to the OAM Console, at:

   `http://ADMINVHN.mycompany.com:7001/oamconsole`

   Log in as the Oracle Access Manager user.
2. Navigate to **Policy Configuration**, then **Shared Components**, then **Authentication Schemes**, and then **FAAuthScheme**.
3. Set the **Challenge Method** to **FORM**.
4. Set the **Authentication Module** to `SaaSModule`.
5. Set the **Challenge URL** to `/pages/oamLogin.jsp`.
6. Set the **Context Type** to **customWar**.
7. Set the **Context Value** to `/fusion_apps`.
8. Set the Challenge Parameters field with the following entries:
   - `federationEnabled=true`
   - `ssoChooserEnabled=false`

     If dual authentication mode is required, set `ssoChooserEnabled=true` instead of `ssoChooserEnabled=false`. Dual authentication mode is required when some users in the Oracle Fusion Applications LDAP directory do not exist in the Identity Provider's directory. Those users cannot be authenticated with Federation SSO and must be challenged locally.
   - `fedSSOEnabled=true`
   - `initial_command=NONE`
   - `TAPPartnerId=OIFDAPPartner`
   - `TAPChallengeURL=https://SSO.mycompany.com:443/fed/user/spoam11g`
9. Click **Apply**.

16.8.2.4.2 Disable Oracle Identity Federation

This section describes how to switch the authentication of the OAM security domain from Federation SSO to local authentication.

Perform the following operations to switch from local authentication to Federation SSO for Browser Based Schemes:

1. In a browser, go to the OAM Console, at:

   `http://ADMINVHN.mycompany.com:7001/oamconsole`

   Log in as the Oracle Access Manager user.
2. Navigate to **Policy Configuration -> Shared Components -> Authentication Schemes -> FAAuthScheme**.
3. Set the **Challenge Method** to **FORM**.
4. Set the **Authentication Module** to `SaaSModule`.
5. Set the **Challenge URL** to `/pages/oamLogin.jsp`.

6. Set the **Context Type** to **customWar**.
7. Set the **Context Value** to `/fusion_apps`.
8. Set the Challenge Parameters field with the following entries:
   - `federationEnabled=false`
   - `ssoChooserEnabled=false`
   - `fedSSOEnabled=false`
   - `initial_command=NONE`
   - `TAPPartnerId=OIFDAPPartner`
   - `TAPChallengeURL=https://SSO.mycompany.com:443/fed/user/spoam11g`
9. Click **Apply**.

16.8.3 Configure Identity Integration with Active Directory

This section describes how to add support for Active Directory to the enterprise deployment.

This section contains the following topics:

- Create Adapters in Oracle Virtual Directory (page 16-27)
- Prepare Active Directory (page 16-30)
- Modify Oracle Identity Manager to Support Active Directory (page 16-34)
- Update the Username Generation Policy for Active Directory (page 16-34)

16.8.3.1 Create Adapters in Oracle Virtual Directory

Oracle Virtual Directory communicates with other directories through adapters.

The procedure is slightly different, depending on the directory to be connected to. The following sections show how to create and validate adapters for supported directories:

- Remove Existing Adapters (page 16-27)
- Create an Oracle Virtual Directory Adapter for Active Directory (page 16-28)
- Validate the Oracle Virtual Directory Adapters (page 16-29)

16.8.3.1.1 Remove Existing Adapters

The provisioning process created Oracle Virtual Directory adapters to Oracle Internet Directory. When switching the identity store to Active Directory, remove these adapters.

1. Log in to Oracle Directory Services Manager (ODSM) at: `http://admin.mycompany.com/odsm`
2. If this has not been done already , create connections to each of the Oracle Virtual Directory instances.
3. Select one of the Oracle Virtual Directory instances and connect to it.
4. Click the **Adapter** tab.
5. Click the adapter **User ID**.

6. Click **Delete Selected Adapter**.
7. Repeat for the adapter **CHANGELOG_OID**.
8. Repeat Steps 1- 7 for each Oracle Virtual Directory instance.

16.8.3.1.2 Create an Oracle Virtual Directory Adapter for Active Directory

`idmConfigTool` can be used to create the Oracle Virtual Directory User and Changelog adapters for Oracle Internet Directory and Active Directory. Oracle Identity Manager requires adapters. It is highly recommended, though not mandatory, to use Oracle Virtual Directory to connect to Oracle Internet Directory.

1. Set the environment variable `ORACLE_HOME` to *`IDM_BASE/products/app/iam`*.
2. Create a properties file for the Active Directory adapter called `ovd1.props`, with the following content:

```
ovd.host:LDAPHOST1.mycompany.com
ovd.port:8899
ovd.binddn:cn=orcladmin
ovd.password:ovdpassword
ovd.oamenabled:true
ovd.ssl:true
ldap1.type:AD
ldap1.host:ADIDSTORE.mycompany.com
ldap1.port:636
ldap1.binddn:cn=adminuser
ldap1.password:adpassword
ldap1.ssl:true
ldap1.base:dc=mycompany,dc=com
ldap1.ovd.base:dc=mycompany,dc=com
usecase.type: single
```

The following list describes the parameters used in the properties file.

- `ovd.host` is the host name of a server running Oracle Virtual Directory.
- `ovd.port` is the https port used to access Oracle Virtual Directory (*`OVD_ADMIN_PORT`*).
- `ovd.binddn` is the user DN used to connect to Oracle Virtual Directory.
- `ovd.password` is the password for the DN used to connect to Oracle Virtual Directory.
- `ovd.oamenabled` is always `true` in Oracle Fusion Applications deployments.
- `ovd.ssl` is set to `true`, as an https port is used.
- `ldap1.type` is set to OID for the Oracle Internet Directory back end directory or set to AD for the Active Directory back end directory.
- `ldap1.host` is the host on which back end directory is located. Use the load balancer name.
- `ldap1.port` is the port used to communicate with the back end directory (*`OID_LDAP_PORT`*).
- `ldap1.binddn` is the bind DN of the `oimLDAP` user.
- `ldap1.password` is the password of the `oimLDAP` user

- `ldap1.ssl` is set to `true` if the back end's SSL connection is used, and otherwise set to `false`. This should always be set to `true` when an adapter is being created for AD.
- `ldap1.base` is the base location in the directory tree.
- `ldap1.ovd.base` is the mapped location in Oracle Virtual Directory.
- `usecase.type` is set to `Single` when using a single directory type.

3. Configure the adapter by using the `idmConfigTool` command, which is located at:

   IDM_BASE/products/app/iam`/idmtools/bin`

   When the `idmConfigTool` is run, it creates or appends to the file `idmDomainConfig.param`. This file is generated in the same directory that the `idmConfigTool` is run from. To ensure that each time the tool is run, the same file is appended to, always run the `idmConfigTool` from the directory:

   IDM_BASE/products/app/iam`/idmtools/bin`

   The syntax of the command is:

   ```
   Linux:idmConfigTool.sh -configOVD input_file=configfile [log_file=logfile]
   For example: idmConfigTool.sh -configOVD input_file=ovd1.props
   ```

   The command requires no input. The output looks like this:

   ```
   The tool has completed its operation. Details have been logged to logfile
   ```

Perform the following tasks on IDMHOST1:

Run this command for each Oracle Virtual Directory instance in the topology, with the appropriate value for `ovd.host` in the property file.

16.8.3.1.3 Validate the Oracle Virtual Directory Adapters

Perform the following tasks by using ODSM:

1. Access ODSM through the load balancer at: `http://ADMIN.mycompany.com/odsm`
2. Connect to Oracle Virtual Directory.
3. Go the **Data Browser** tab.
4. Expand **Client View** to see each of the user adapter root DNs listed.
5. Expand the user adapter root DN, if there are objects already in the back end LDAP server, see those objects here. ODSM does not support changelog query, so the `cn=changelog` subtree cannot be expanded.
6. Perform the following tasks by using the command-line:
   a. Validate the user adapters by typing:

      ```
      ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q  -b
      <user_search_base> -s sub "objectclass=inetorgperson" dn
      ```

      For example:

      ```
      ldapsearch -h LDAPHOST1.mycompany.com -p 6501 -D "cn=orcladmin" -q -b
      "cn=Users,dc=mycompany,dc=com" -s sub "objectclass=inetorgperson" dn
      ```

      Supply the password when prompted.

      See the user entries that already exist in the back end LDAP server.

b. Validate changelog adapters by typing:

```
ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q  -b
"cn=changelog" -s one "changenumber>=0"
```

For example:

```
ldapsearch -h LDAPHOST1 -p 6501 -D "cn=orcladmin" -q -b "cn=changelog"
-s one "changenumber>=0"
```

The command returns logs of data, such as creation of all the users. It returns without error if the changelog adapters are valid.

c. Validate lastchangenumber query by typing:

```
ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q -b
"cn=changelog" -s base 'objectclass=*' lastchangenumber
```

For example:

```
ldapsearch -h LDAPHOST1 -p 6501 -D "cn=orcladmin" -q -b "cn=changelog"
-s base 'objectclass=*' lastchangenumber
```

The command returns the latest change number generated in the back end LDAP server.

16.8.3.2 Prepare Active Directory

Prepare Active Directory as described in the following sections:

- Configure Active Directory for Use with Oracle Access Manager and Oracle Identity Manager (page 16-30)
- Create Users and Groups (page 16-31)
- Create Access Control Lists in Non-Oracle Internet Directory Directories (page 16-33)

16.8.3.2.1 Configure Active Directory for Use with Oracle Access Manager and Oracle Identity Manager

This section describes how to configure Active Directory. Extend the schema in Active Directory as follows.

WARNING: The order in which the steps are performed is critical!

1. Locate the following files:

   IDM_BASE/products/dir/idm/oam/server/oim-intg/ ldif/ad/schema/ADUserSchema.ldif

   IDM_BASE/products/dir/idm/oam/server/oim-intg/ldif/ad/schema/AD_oam_pwd_schema_add.ldif

2. In both these files, replace the `domain-dn` with the appropriate `domain-dn` value
3. Use `ldapadd` from the command line to load the two LDIF files, as follows.

   ```
   ldapadd -h activedirectoryhostname -p activedirectoryportnumber -D
   AD_administrator -q -c -f file
   ```

where *AD_administrator* is a user which has schema extension privileges to the directory

For example:

```
ldapadd -h "ACTIVEDIRECTORYHOST.mycompany.com" -p 389 -D adminuser –q -c -f
ADUserSchema.ldif
ldapadd -h "ACTIVEDIRECTORYHOST.mycompany.com" -p 389 -D adminuser -q -c -f
AD_oam_pwd_schema_add.ldif
```

After the `-D`, either a DN or *user@domain.com* can be specified.

4. Then go to:

   IDM_BASE`/products/app/oracle_common/modules/oracle.ovd_11.1.1/oimtemplates`

   Run the following command to extend Active Directory schema:

   ```
   sh extendadschema.sh -h AD_host -p AD_port -D 'administrator@mydomain.com'
   -AD "dc=mydomain,dc=com" -OAM true
   ```

16.8.3.2.2 Create Users and Groups

Create users and groups as described in the following sections.

16.8.3.2.2.1 Create Users and Groups by Using the idmConfigTool

Configure the Identity Store by using the command `idmConfigTool`, which is located at:

IDM_BASE/products/app/iam`/idmtools/bin`

When the `idmConfigTool`is run, it creates or appends to the file `idmDomainConfig.param`. This file is generated in the same directory in which the `idmConfigTool` is run. To ensure that the same file is appended to every time the tool is run, always run the `idmConfigTool` from the directory:

IDM_BASE/products/app/iam`/idmtools/bin`

The syntax of the command on Linux is:

```
idmConfigTool.sh -prepareIDStore mode=all input_file=configfile
```

For example:

```
idmConfigTool.sh -prepareIDStore mode=all input_file=idstore.props
```

When the command runs, it prompts to enter the password of the account to be connected to and passwords for the accounts that are being created.

The password must conform to the following rules:

This invocation of `idmConfigTool` creates the group `orclFAOAMUserWritePrivilegeGroup`.

16.8.3.2.2.2 Create the Configuration File

Create a property file, `idstore.props`, to use when preparing the Identity Store. The file has the following structure:

```
# Common
IDSTORE_HOST: LDAPHOST1.mycompany.com
IDSTORE_PORT: 389
IDSTORE_BINDDN: cn=orcladmin
IDSTORE_GROUPSEARCHBASE: cn=Groups,dc=mycompany,dc=com
IDSTORE_SEARCHBASE: dc=mycompany,dc=com
IDSTORE_USERNAMEATTRIBUTE: cn
IDSTORE_LOGINATTRIBUTE: uid
IDSTORE_USERSEARCHBASE: cn=Users, dc=mycompany,dc=com
POLICYSTORE_SHARES_IDSTORE: true
# OAM
IDSTORE_OAMADMINUSER:oamadmin
IDSTORE_OAMSOFTWAREUSER:oamLDAP
OAM11G_IDSTORE_ROLE_SECURITY_ADMIN:OAMAdministrators
# OAM and OIM
IDSTORE_SYSTEMIDBASE: cn=systemids,dc=mycompany,dc=com
# OIM
IDSTORE_OIMADMINGROUP: OIMAdministrators
IDSTORE_OIMADMINUSER: oimLDAP
# Required due to bug
IDSTORE_OAAMADMINUSER : oaamadmin
# Fusion Applications
IDSTORE_READONLYUSER: IDROUser
IDSTORE_READWRITEUSER: IDRWUser
IDSTORE_SUPERUSER: weblogic_fa
# Weblogic
IDSTORE_WLSADMINUSER : weblogic_idm
```

Where:

- `IDSTORE_BINDDN` is an administrative user in the Identity Store Directory
- `IDSTORE_GROUPSEARCHBASE` is the location in the directory where Groups are Stored.
- `IDSTORE_HOST` and `IDSTORE_PORT` are, respectively, the host and port of the Identity Store directory. Specify the back end directory here, rather than Oracle Virtual Directory, Active Directory: `LDAPHOST1` and `389`.
- `IDSTORE_LOGINATTRIBUTE` is the LDAP attribute which contains the users Login name.
- `IDSTORE_OAMADMINUSER` is the name of the user to be created as the Oracle Access Manager Administrator.
- `IDSTORE_OAMSOFTWAREUSER` is a user that gets created in LDAP that is used when Oracle Access Manager is running to connect to the LDAP server.
- `IDSTORE_OIMADMINGROUP` Is the name of the group to be created to hold the Oracle Identity Manager administrative users.
- `IDSTORE_OIMADMINUSER` is the user that Oracle Identity Manager uses to connect to the Identity store.
- `IDSTORE_READONLYUSER` is the name of a user to be created, which has Read Only permissions on the Identity Store.
- `IDSTORE_READWRITEUSER` is the name of a user to be created, which has Read/Write permissions on the Identity Store.
- `IDSTORE_SUPERUSER` is the name of the administration user to be used to log in to the WebLogic Administration Console in the Oracle Fusion Applications domain.

- IDSTORE_SEARCHBASE is the location in the directory where Users and Groups are stored.
- IDSTORE_SYSTEMIDBASE is the location of a container in the directory where users can be placed when they are not wanted in the main user container. This happens rarely but one example is the Oracle Identity Manager reconciliation user which is also used for the bind DN user in Oracle Virtual Directory adapters.
- IDSTORE_USERSEARCHBASE is the location in the directory where Users are Stored.
- OAM11G_IDSTORE_ROLE_SECURITY_ADMIN is the name of the group which is used to allow access to the OAM console.
- POLICYSTORE_SHARES_IDSTORE is set to true for IDM 11*g*.
- IDSTORE_OAAMADMINUSER is required because of a bug in idmConfigTool.

16.8.3.2.3 Create Access Control Lists in Non-Oracle Internet Directory Directories

In the preceding sections, the Identity Store was seeded with users and artifacts for the Oracle components. If the Identity Store is hosted in a non-Oracle Internet Directory directory, such as Microsoft Active Directory, set up the access control lists (ACLs) to provide appropriate privileges to the entities created. This section lists the artifacts created and the privileges required for the artifacts.

- Users and groups. ACLs to the users and groups container are provided in Oracle Internet Directory. Set them manually for other directories. The Oracle Identity Manager/Oracle Access Manager integration and Oracle Fusion Applications require the following artifacts to be created in the Identity store.
  - Group with read privileges to the users container (orclFAUserReadPrivilegeGroup). Configure the local directory ACLs so that this group has privileges to read all the attributes of the users in the Identity Store.
  - Group with read/write privileges to the users container (orclFAUserWritePrivilegeGroup)
  - Group with read privileges to the groups container (orclFAGroupReadPrivilegeGroup)
  - Group with read privileges to the groups container (orclFAGroupWritePrivilegeGroup)
  - Group with write privileges to a partial set of attributes (orclFAUserWritePrefsPrivilegeGroup)
- The user specified by the IDSTORE_READONLYUSER parameter. When running the preconfigIDstore command, this user is assigned to the groups orclFAUserReadPrivilegeGroup, orclFAWritePrefsPrivilegeGroup, and orclFAGroupReadPrivilegeGroup. The user also needs compare privileges to the userpassword attribute of the user entry.
- The user specified by the IDSTORE_READWRITEUSER parameter. It is assigned to the groups orclFAUserWritePrivilegeGroup and orclFAGroupWritePrivilegeGroup.
- System IDs. The System ID container is created for storing all the system identifiers. If there is another container in which the users are to be created, that is specified as part of the admin.
- Oracle Access Manager Admin User. This user is added to the OAM Administrator group, which provides permission for the administration of the Oracle Access

Manager Console. No LDAP schema level privileges are required, since this is just an application user.

- Oracle Access Manager Software User. This user is added to the groups where the user gets read privileges to the container. This is also provided with schema admin privileges.
- Oracle Identity Manager user `oimLDAP` under System ID container. Password policies are set accordingly in the container. The passwords for the users in the System ID container must be set up so that they do not expire.
- Oracle Identity Manager administration group. The Oracle Identity Manager user is added as its member. The Oracle Identity Manager admin group is given complete read/write privileges to all the user and group entities in the directory.
- WebLogic Administrator. This is the administrator of the IDM domain for Oracle Virtual Directory
- WebLogic Administrator Group. The WebLogic administrator is added as a member. This is the administrator group of the IDM domain for Oracle Virtual Directory.
- Reserve container. Permissions are provided to the Oracle Identity Manager admin group to perform read/write operations.

16.8.3.3 Modify Oracle Identity Manager to Support Active Directory

When first installed, Oracle Identity Manager has a set of default system properties for its operation.

If the Identity Store is in Active Directory,
change the System property `XL.DefaultUserNamePolicyImpl` to `oracle.iam.identity.usermgmt.impl.plugins.FirstNameLastNamePolicyForAD` or `oracle.iam.identity.usermgmt.impl.plugins.LastNameFirstNamePolicyForAD`.

See Managing System Properties in the *Oracle Fusion Middleware Administrator's Guide for Oracle Identity Manager*.

16.8.3.4 Update the Username Generation Policy for Active Directory

If the back-end directory is Active Directory, update Oracle Identity Manager so that it only allows user names with a maximum of 20 characters. This is a limitation of Active Directory. Update the username generation policy from `DefaultComboPolicy` to `FirstnameLastnamepolicyforAD` as follows.

1. Log in to the OIM Console at the URL listed in About Oracle Identity Management Console URLs (page 10-27).
2. Click **Advanced** on the top of the right pane.
3. Click **Search System properties.**
4. On the navigation bar in the left pane, search on **Username Generation**.
5. Click **Default Policy for Username Generation**.
6. In the **Value** field, update the entry from `oracle.iam.identity.usermgmt.impl.plugins.DefaultComboPolicy` to `oracle.iam.identity.usermgmt.impl.plugins.FirstNameLastNamePolicyForAD`.
7. Click **Save**.

16.8.4 Set up LDAP Split Profile and Enable Active Directory Users in Oracle Fusion Applications

A split profile, or split directory configuration, is one where identity data is stored in multiple directories, possibly in different locations. A split profile is used to store custom attributes required for Oracle Fusion Applications deployment. Use this kind of deployment when to avoid modifying the existing Identity Store by extending the schema.

Oracle Virtual Directory unifies Active Directory and Oracle Internet Directory to provide a single consolidated abstract view. This is a very generic implementation scenario but is very important when setting up Oracle Identity Management for Oracle Fusion Applications to use the existing Enterprise Repository for the user base but do not want to modify the existing Enterprise Repository Schema.

For example: To provision users out of the existing Active Directory without replicating the user base to some other repository, use split profile with Active Directory and Oracle Internet Directory. In this scenario, Oracle Virtual Directory provides the consolidated view.

Figure 16-1 LDAP Split Profile Configuration

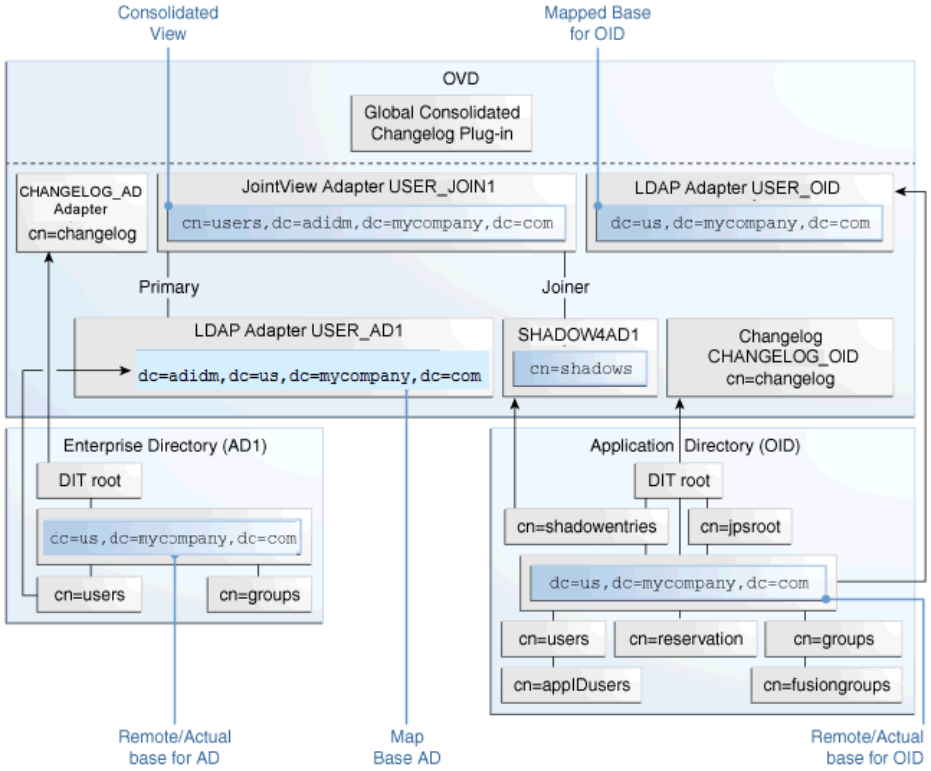


Figure 16-1 (page 16-35) illustrates the scenario of split profile configuration where the existing Enterprise Repository is not extended and represents the view from the Oracle Virtual Directory level (adapter plug-in view/unified view).

In the image, although the actual base for both Oracle Internet Directory and Active Directory repositories are the same `dc=mycompany,dc=com`, the Oracle Virtual Directory Adapters are configured to map uniquely and to consolidate to a unified view of `dc=adidm,dc=mycompany,dc=com`.

The following sections describe how to set up split profile to enable Active Directory Users.

- Create Adapters in Oracle Virtual Directory for consolidating Active Directory and Oracle Internet Directory (page 16-36)
- Configure the Storable Attributes (page 16-43)
- Configure Oracle Access Manager and Oracle Identity Manager for Split Profile (page 16-43)

16.8.4.1 Create Adapters in Oracle Virtual Directory for consolidating Active Directory and Oracle Internet Directory

This section details the steps required to create Adapters in Oracle Virtual Directory for consolidating the two directory servers Active Directory and Oracle Internet Directory:

- Setup Oracle Internet Directory as a Shadow Directory (page 16-36)
- Create a shadow joiner adapter (page 16-38)
- Verify Oracle Internet Directory User Adapter and Changelog Adapter (page 16-39)
- Create Active Directory User Adapter (page 16-39)
- Create Active Directory Changelog adapter (page 16-40)
- Create Join adapter (page 16-41)
- Create Global plugin for virtualmemberof functionality (page 16-42)
- Create Global Plugin for Changelog (page 16-42)

16.8.4.1.1 Set Up Oracle Internet Directory as a Shadow Directory

As Active Directory is not being extended, Oracle Internet Directory is used as a shadow directory. Use Oracle Virtual Directory to merge the entities from the directories by creating a container in Oracle Internet Directory to store Fusion Applications specific attributes.

1. Create a shadowentries container in Oracle Internet Directory.

   Create a `ShadowADContainer.ldif` file with the following details and run it against Oracle Internet Directory using the `ldapadd` command.

   Contents of ShadowADContainer.ldif:

   ```
   dn: cn=shadowentries
   cn: shadowentries
   objectclass: top
   objectclass: orclContainer
   ```

   Command:

   ```
   ldapadd -h idmhost1.mycompany.com -p 3060 -D "cn=orcladmin" -q -c -v
   -f /tmp/ShadowADContainer.ldif
   ```

Ensure that the following environment variables are set before using ldapadd:

- ORACLE_HOME (set to *IDM_BASE*/products/dir/oid)
- PATH - The following directory locations should be in the PATH:

  ORACLE_HOME/bin

  ORACLE_HOME/ldap/bin

  ORACLE_HOME/ldap/admin

Output:

```
add cn:
        shadowentries
add objectclass:
        top
        orclContainer
adding new entry cn=shadowentries
modify complete
```

2. Verify if the container is successfully created by accessing ODSM using the URL: <sso-address>/odsm.

   If Oracle Internet Directory/Oracle Virtual Directory servers are not listed in the ODSM client, configure them before proceeding to the next step. See Creating ODSM Connections to Oracle Virtual Directory (page 17-18).

3. Grant access to the shadowentries container by creating a Grant.ldif file as follows:

   Contents of Grant.ldif:

```
dn: cn=shadowentries
changetype: modify
add: orclaci
orclaci: access to entry by
group="cn=RealmAdministrators,cn=groups,cn=OracleContext,dc=mycompany,dc=com"
 (browse,add,delete)
orclaci: access to attr=(*) by
group="cn=RealmAdministrators,cn=groups,cn=OracleContext,dc=mycompany,dc=com"
 (read,write,search,compare)
orclaci: access to entry by
group="cn=OIMAdministrators,cn=Groups,dc=mycompany,dc=com"
(browse,add,delete)orclaci: access to attr=(*) by
group="cn=OIMAdministrators,cn=Groups,dc=mycompany,dc=com"
(search,read,compare,write)
-
changetype: modify
add: orclentrylevelaci
orclentrylevelaci: access to entry by * (browse,noadd,nodelete)
orclentrylevelaci: access to attr=(*) by * (read,search,nowrite,nocompare)
```

Command:

```
ldapadd -h idmhost1.mycompany.com -p 3060 -D "cn=orcladmin" -q -c -v
-f /tmp/Grant.ldif
```

Output:

```
add orclaci:        access to entry by
group="cn=RealmAdministrators,cn=groups,cn=OracleContext,dc=mycompany,dc=com"
 (browse,add,delete)        access to attr=(*) by
group="cn=RealmAdministrators,cn=groups,cn=OracleContext,dc=mycompany,dc=com"
```

```
 (read,write,search,compare)        access to entry by
group="cn=OIMAdministrators,cn=Groups,dc=mycompany,dc=com"
(browse,add,delete)        access to attr=(*) by
group="cn=OIMAdministrators,cn=Groups,dc=mycompany,dc=com"
(search,read,compare,write)add orclentrylevelaci:        access to entry by
* (browse,noadd,nodelete)        access to attr=(*) by *
(read,search,nowrite,nocompare)modifying entry cn=shadowentriesmodify
complete
```

4. Verify the access permissions in Oracle Internet Directory with ODSM using the URL: `<sso-address>/odsm`. To verify the settings select the container `cn=shadowentries` in the Data Browser and open the **Subtree Access** tab. The table Content Access Control should display the entries that were created.

16.8.4.1.2 Create a Shadow Joiner Adapter

WARNING: All the ODSM steps should be performed by connecting to Oracle Virtual Directory.

To create a shadow joiner adapter, select the **Adapter** tab, and then click the Create adapter icon in the left pane.

1. In the **New Adapter Wizard** window, select the **Type** tab:
   a. In the **Adapter** drop-down list, select `LDAP`.
   b. In the **Adapter Name** field, specify `SHADOW4AD1`.
   c. In the **Adapter Template** drop-down list, select template `User_OID`.
   d. Click **Next**.
2. In the **New LDAP Adapter Wizard** window:

   Connection tab:

   a. Click **Add Host** and specify the Host and Port values. It is recommended to use the same value used for the USER_OID adapter.
   b. In the **Server Proxy Bind DN** field, specify the required value. It is recommended to use the same value used for the USER_OID adapter.
   c. In the **Proxy Password** field, specify the password.
   d. Click **Next**.

   Connection Test tab:

   a. Verify if the connection is successful and click **Next**.

   Namespace tab:

   a. In the **Remote Base** field, specify `cn=shadowentries`.
   b. In the **Mapped Namespace** field, specify `cn=shadows`.
   c. Click **Next**.

   Summary tab:

   a. Verify the summary details and click **Next**.
3. Verify the created adapter on the left pane, and select it.
4. Review the details of the **General** tab, and then click the **Routing** tab.

5. On the **Routing** tab, from the **Visibility** drop-down list, select `Internal` and click **Apply**.
6. On the `Plugins` tab, select **User management** and click **Edit** (select User Management and click the pencil icon).
   - oamEnabled should be changed from 'false' to 'true'.
   - oimLanguages must be added and set to = 'en'.
7. Click **Apply**.

16.8.4.1.3 Verify Oracle Internet Directory User Adapter and Changelog Adapter

1. Select **USER_OID** and verify default settings on the **General** tab.
2. If any changes are required, select the **Plug-ins** tab and edit **User Management** (select User Management and click the pencil icon).
3. Select **CHANGELOG_OID** adapter and verify default settings on the **General** tab.
4. Select the **Plug-ins** tab and edit the **changelog** plugin.
5. In addition to default values, add the following:
   - `targetDNFilter=cn=shadowentries`
   - `virtualDITAdapterName=USER_JOIN1;SHADOW4AD1`
   - `virtualDITAdapterName=USER_OID` (if this value is already present, do not make any changes)
6. Click **OK** and **Apply**.

16.8.4.1.4 Create Active Directory User Adapter

In the Directory Manager, on the **Adapter** tab, click **New Adapter**.

1. In the **New Adapter Wizard** window, on the **Type** tab:
   a. In the **Adapter Type** drop-down list, select `LDAP`.
   b. In the **Adapter Name** field, specify `USER_AD`.
   c. In the **Adapter Template** drop-down list, select `User_ActiveDirectory`.
2. Click **Next**.
3. In the **New LDAP Adapter Wizard** window:

   Connection tab:

   a. In the **DNS Settings** area, for the **Use DNS for Auto Discovery** option, select the **No** radio button.
   b. Click **Add Host** and specify the Host and Port values. Ensure that the **Is Read Only** checkbox is selected to ensure no write attempts against the Active Directory.
   c. Do not select the **Use SSL/TLS** checkbox.
   d. The **SSL Authentication Mode** will be read-only and set to No Authentication.
   e. In the **Server Proxy Bind DN** field, specify the required value.
   f. In the **Proxy Password** field, specify the password.

g. Click **Next**.

Connection Test tab:

a. Verify if the connection is successful and click **Next**.

Namespace tab:

a. In the **Remote Base** field, specify `dc=us,dc=mycompany,dc=com`.

b. In the **Mapped Namespace** field, specify `dc=adidm,dc=us,dc=mycompany,dc=com`.

c. Click **Next**.

Summary tab:

a. Verify the summary details and click **Finish**.

4. Verify and review the details on the **General** tab.
5. On the **Routing** tab, from the **Visibility** drop-down list, select **Internal**, and click **Apply**.
6. On the **Plug-ins** tab, edit **User Management** and set the following parameter values:

   a. `oamEnabled=true`

   b. Add `filterObjectClass = oblixOrgPerson,oblixPersonPwdPolicy,OIMPersonPwdPolicy`

7. Click **OK** and **Apply**.

16.8.4.1.5 Create Active Directory Changelog adapter

In the Directory Manager, on the **Adapter** tab, click **New Adapter**.

1. In the **New Adapter Wizard** window, on the **Type** tab:

   a. In the **Adapter Type** drop-down list, select `LDAP`.

   b. In the **Adapter Name** field, specify `CHANGELOG_AD`.

   c. In the **Adapter Template** drop-down list, select `Changelog_ActiveDirectory`.

2. Click **Next**.
3. In the **New LDAP Adapter Wizard** window:

   Connection tab:

   a. In the **DNS Settings** area, for the **Use DNS for Auto Discovery** option, select the **No** radio button.

   b. Click **Add Host** and specify the Host and Port values. Ensure that the **Is Read Only** checkbox is selected to ensure no write attempts against the Active Directory.

   c. Do not select the **Use SSL/TLS** checkbox.

   d. The **SSL Authentication Mode** will be read-only and set to No Authentication.

   e. In the **Server Proxy Bind DN** field, specify the required value. It is recommended to use the same value used for the USER_AD adapter.

   f. In the **Proxy Password** field, specify the password.

g. Click **Next**.

Connection Test tab:

a. Verify if the connection is successful and click **Next**.

Namespace tab:

a. In the **Remote Base** field, do not specify any value.

b. In the **Mapped Namespace** field, specify `cn=changelog`.

c. Click **Next**.

Summary tab:

a. Verify the summary details and click **Finish**.

4. Verify and review the details on the **General** tab.
5. On the **Plug-ins** tab, edit **User Management** and set the following parameter values:
   a. `mapUserState=true`
   b. `oamEnabled=true`
   c. `targetDNFilter=dc=mycompany,dc=com`
   d. `virtualDITAdapterName=USER_JOIN1;USER_AD`
   e. `sizeLimit=1000`
6. Click **OK** and **Apply**.

16.8.4.1.6 Create Join Adapter

In the Directory Manager, on the **Adapter** tab, click **New Adapter**.

1. In the **New Adapter Wizard** window, on the **Type** tab:
   a. In the **Adapter Type** drop-down list, select `Join`.
   b. In the **Adapter Name** field, specify `USER_JOIN1`.
   c. In the **Adapter Template** drop-down list, select `Default`.
2. Click **Next**.
3. In the **New Join Adapter Wizard** window:

   Settings tab:

   a. In the **Adapter Suffix/Namespace** field, specify `cn=users,dc=adidm,dc=mycompany,dc=com`.
   b. In the **Primary Adapter** drop-down list, select `USER_AD`.
   c. In the **Bind Adapters** field, specify `USER_AD`.
   d. Click **Next**.

   Summary tab:

   a. Verify the summary details and click **Finish**.
4. Verify and review the details on the **General** tab. Select the `USER_JOIN1` adapter and add join rule. In the **Join Rule** window:

a. In the **Joined Adapter** drop-down list, select `SHADOW4AD1`.

b. In the **Type** drop-down list, select `ShadowJoiner`.

c. In the **Condition** field, specify `cn`.

d. Click **OK**.

5. Click **Apply** and verify the details.

Before proceeding, review all adapter details on the **Home** tab.

16.8.4.1.7 Create Global Plugin for virtualmemberof Functionality

1. In ODSM connected to Oracle Virtual Directory, select the **Advanced** tab, then select **global plugins** and click **Create**.
2. In the **Plug-in** window, specify values as follows:
   a. In the **Name** field, specify `global_virtmember1`.
   b. In the **Class** field, click **Select** and select `VirtualMemberOfPlugin` from the list.
   c. In the **Parameters** field, add the following values:
      i. `Name = searchBase, Value = cn=groups,dc=mycompany,dc=com`
      ii. `Name = adapterName, Value = USER_OID`
      iii. `Name = explicitrequestonly, Value = false`
   d. In the **Namespace** field, add `dc=mycompany,dc=com`.
   e. Click **Apply**. An Internal Server Error may be displayed due to time out.
   f. Click **OK**.

16.8.4.1.8 Create Global Plugin for Changelog

1. In ODSM connected to Oracle Virtual Directory, select the **Advanced** tab, then select **global plugins** and click **Create**.
2. In the **Plug-in** window, specify values as follows:
   a. In the **Name** field, specify `GlobalChangeLogPlugin`.
   b. In the **Class** field, click **Select** and select `com.octetstring.vde.chain.plugins.changelog.ConsolidatedChglogPlugin`.
   c. Click **Apply**. An Internal Server Error is displayed due to timeout.
   d. Click **OK**. Reconnect to Oracle Virtual Directory and then browse the adbase tree.
   e. Verify changelog functionality using the following command:

```
ldapsearch -h idmhost1.mycompany.com -p 6501 -D "cn=orcladmin" -q
-b "cn=changelog" -s base "objectclass=*" lastchangenumber
```

The command should return the following output:

```
cn=ChangeLog

lastChangeNumber=CHANGELOG_AD:1234;CHANGELOG_OID:17890
```

16.8.4.2 Configure the Storable Attributes

Configure the storable attributes to ensure that the Oracle Virtual Directory can correctly route attributes against Active Directory and Oracle Internet Directory and does not store attributes in Active Directory.

1. In ODSM connected to Oracle Virtual Directory, select the **Adapter** tab, then select **SHADOW4AD** and click the **Routing** tab.
2. In the **Storable Attributes** field, click **Add** and paste the following attribute values.

```
orclMTUid
orclTimeZone
orclDisplayNameLanguagePreference
orcldateFormat
orclFontSize
orclnumberFormat
orclPwdExpirationDate
orclGenerationQualifier
middleName
c
orclHireDate
orclImpersonationGrantee
orclAdminPrivilege
orclIsEnabled
orclFAPartyID
orclembeddedHelp
orclFATerritory
orclAccessibilityMode
orclImpersonationGranter
orclPwdChangeRequired
orclColorContrast
orclActiveEndDate
orclFAUserID
orclMTTenantUName
orcltimeFormat
orclcurrency
orclFAPersonID
employeeNumber
orclActiveStartDate
orclMTTenantGUID
orclFALanguage
manager
```

3. Select **USER_AD** and click the **Routing** tab.
4. In the **Unstorable Attributes** field, click **Add** and paste the attribute values specified in Step 2.
5. Click **Apply**.

16.8.4.3 Configure Oracle Access Manager and Oracle Identity Manager for Split Profile

This section details the steps required to configure Oracle Access Manager and Oracle Identity Manager for Split Profile.

- Configure Oracle Identity Management Domain with new settings (page 16-44)

- Verify and Configure OAM to use third-party users as OAM Administrators (page 16-44)
- Verify Oracle Identity Manager (page 16-45)
- Update Container Rules in MDS for Split Profile (page 16-45)
- Update Username Generation Policy to Accommodate Active Directory (page 16-45)
- Change User and Group Search Base for all Oracle Fusion Applications Domains (page 16-46)
- Add Users from Active Directory into Oracle Identity Manager (page 16-46)
- Grant Privileges to Active Directory User (page 16-46)

16.8.4.3.1 Configure Oracle Identity Management Domain with new settings

1. Log in to the Oracle WebLogic Server console as `weblogic_idm` and go to **Security Realms**, and then click **myrealm**, **Providers**.
2. Click **OVDAuthenticator**, then select the **Provider Specific** tab, and then click **Lock & Edit**.
3. Click **Save** and then click **Activate Changes**.
4. Restart Oracle Identity Management, log in to the Oracle WebLogic Server console, and go to **Security Realms**, **myrealm**.
5. On the **Users** tab and **Groups** tab, verify that the users from Active Directory are also displayed in addition to Oracle Internet Directory.

16.8.4.3.2 Verify and Configure OAM to use third-party users as OAM Administrators

1. Log in to the OAM console, and go to **system configuration**, **common configuration**, **datasource**s, **user identity stores**, **OIMIDStore**.
2. On the **OIMIDStore** tab, in the **Users and Groups** area, delete "`cn=users`" and "`cn=groups`" from the **User Search Base** and **Group Search Base** fields.
3. Click **Apply**.
4. In the **Access System Administrators** area, click the green + to add an OAM Administrator.
5. In the **Add System Administrator Roles** window, search for and select an Active Directory user.
6. Click **Add Selected**.
7. Click **Apply**.
8. On the Oracle Identity Management server, do an ldapsearch for the same user to retrieve DN.
9. Log into ODSM with Oracle Internet Directory, and browse to **cn=OAMadministrators** under **dc=com,dc=mycompany,dc=groups**. Click the green + and add the DN.
10. Click **Apply**.
11. Log in to the OAM console again with the Active Directory user credentials.

16.8.4.3.3 Verify Oracle Identity Manager

1. Log in to the Oracle Identity Manager as xelsysadm (example `https://sso.mycompany.com/oim`).
2. Click **Advanced**, **Configuration**, **Resource Management**, **Manage IT Resource**. Ensure that pop-ups are allowed.
3. In the **Manage IT Resource** window, from the **IT Resource Type** drop-down list, select `Directory Server`.
4. Click **Search**.
5. Ensure that the **Search Base** and **User Reservation Container** fields contain the existing Oracle Identity Manager values.

16.8.4.3.4 Update Container Rules in MDS for Split Profile

1. Navigate to the Oracle Identity Manager home's `bin` folder.
2. In the `weblogic.properties` file, set the following three values:

```
wls_servername=wls_oim1
application_name=OIMMetadata
metadata_from_loc=/tmp/oimtemp
```

3. Create the following directory structure: `/tmp/oimtemp/file/` and create a file called `LDAPContainerRules.xml` with following content:

```
<?xml version='1.0' encoding='UTF-8'?>
<container-rules>
<user>
<rule>
<expression>Default</expression>
<container>cn=Users,dc=mycompany,dc=com</container>
<description>UserContainer</description>
</rule>
</user>
<role>
<rule>
<expression>Default</expression>
<container>cn=Groups,dc=mycompany,dc=com</container>
<description>RoleContainer</description>
</rule>
</role>
</container-rules>
```

4. Run the `weblogicImportMetadata.sh` command to import content from the xml file.

16.8.4.3.5 Update Username Generation Policy to Accommodate Active Directory

1. Log in to Oracle Identity Manager, typically `https://sso.mycompany.com/oim` as xelsysadm and go to **Advanced**, **Search System Properties**, **Advanced Search**.
2. Search for "`Username Generation`" and then click on **Default policy for username generation**.

3. In the **Value** field, update the value from `oracle.iam.identity.usermgmt.impl.plugins.DefaultComboPolicy` to `oracle.iam.identity.usermgmt.impl.plugins.FirstNameLastNamePolicyForAD`.
4. Click **Save**.

16.8.4.3.6 Change User and Group Search Base for all Oracle Fusion Applications Domains

1. Ensure all Oracle Fusion Applications components are shut down on the Oracle Fusion Applications node.
2. Do a backup of the Fusion domains structure.
3. Change `user-base-dn` and `group-base-dn` in xml files for all domains using the following commands:

   The `sed` command does the actual change, the preceding commands are used for verification.

   ```
   cd $APPLICATIONS_CONFIG/domains/<hostname>
   grep -i "user-base-dn" */config/config.xml
   grep -i "group-base-dn" */config/config.xml
   ls -l */config/config.xml
   sed -i 's/<wls:group-base-dn>cn=Groups,dc=mycompany/<wls:group-base-
   dn>dc=mycompany/g' */config/config.xml
   sed -i 's/<wls:user-base-dn>cn=Users,dc=mycompany/<wls:user-base-
   dn>dc=mycompany/g' */config/config.xml
   ```

4. Restart all Oracle Fusion Applications components.

16.8.4.3.7 Add Users from Active Directory into Oracle Identity Manager

1. Log in to Oracle Identity Manager, typically `https://sso.mycompany.com/oim`, and go to **Advanced**, **Search Scheduled Jobs**, **Advanced Search**.
2. Search for "`LDAP user create`" and select **LDAP User Create and Update Full Reconciliation** to run the job.
3. Click **Refresh** and verify that the *job status* changes from running to stopped, and *execution status* is **success**.
4. Repeat Step 1 to Step 3 for **LDAP Role Create and Update Full Reconciliation** job.

16.8.4.3.8 Grant Privileges to Active Directory User

1. In Oracle Identity Manager, click **Administration**, **Advanced Search: Users**, and search for an Active Directory user.
2. In the displayed search result, select the user and click the **Roles** tab to review the current roles.
3. Click **Assign** and select a new role.
4. Verify if the user has the new role assigned. Log in to the Oracle Fusion Applications home page and verify the dashboard.

16.8.5 Set Up Oracle Identity Management Node Manager for SSL

Follow the instructions detailed in this section **ONLY** for EDG topology and only if the **Configure Second application instances** option is selected on the Node Topology Configuration Page (page 10-5).

This section contains the following topics:

- Overview of the Node Manager (page 16-47)
- Configure Node Manager to Use SSL (page 16-48)
- Update Domain to Access Node Manager Using SSL (page 16-48)
- Update Start and Stop Scripts to Use SSL (page 16-48)
- Enable Host Name Verification Certificates for Node Manager (page 16-49)
- Update boot.properties Files (page 16-54)
- Start Node Manager (page 16-54)

16.8.5.1 Overview of the Node Manager

Node Manager enables to start and stop the Administration Server and the Managed Servers.

Process

The topologies and hosts are shown in Table 16-1 (page 16-47).

Table 16-1 Hosts in Each Topology

Topology	Hosts
OAM11g/OIM11g	IDMHOST1 IDMHOST2
OIF11g	IDMHOST1 IDMHOST2

Note that the procedures in this section must be performed multiple times for each VIP-and-IP pair using the information provided in the component-specific sections.

Recommendations

Oracle provides two main recommendations for Node Manager configuration in enterprise deployment topologies:

- Oracle recommends placing the Node Manager log file in a location different from the default one (which is inside the Middleware Home where Node Manager resides).
- Oracle also recommends using host name verification for the communication between Node Manager and the servers in the domain. This requires the use of certificates for the different addresses used in the domain. This section explains the steps for configuring certificates in the hosts for host name verification. See Enable Host Name Verification Certificates for Node Manager (page 16-49).

The passwords used in this guide are used only as examples. Use secure passwords in a production environment. For example, use passwords that consist of random sequences of both uppercase and lowercase characters as well as numbers.

16.8.5.2 Configure Node Manager to Use SSL

By default, provisioning does not configure Node Manager in SSL mode. Configure each node manager in the topology to use SSL.

For each node manager that has its configuration in *IDM_CONFIG*/nodemanager/hostname, perform the following steps:

1. Edit the file nodemanager.properties.
2. Change the line SecureListener=false to SecureListener=true.
3. Save the file.
4. Restart Node Manager by killing the nodemanager process, and restart by running the following command:

   ```
   startNodeManagerWrapper.sh
   ```

Repeat these steps for each node manager.

16.8.5.3 Update Domain to Access Node Manager Using SSL

1. Log in to the WebLogic Administration console as the user weblogic_idm. Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27).
2. Select **IDMDomain**, **Environment**, **Machines** from the Domain Structure menu.
3. Click on **Lock and Edit**.
4. Click on one of the machines, for example **idmhost1.mycompany.com**.
5. Click on the **Node Manager** tab.
6. Change **Type** from **Plain** to **SSL**.
7. Click **Save**.
8. Repeat Steps 4-7 for each machine.
9. Click **Activate Changes**.

16.8.5.4 Update Start and Stop Scripts to Use SSL

Update the following files, which are generated by the provisioning tool. Each of these files is located in the directory *IDM_CONFIG*/scripts/basescripts:

- stop_nodemanager_template.py
- stop_adminserver_template.py
- start_adminserver_template.py

Do the following for each of the files:

1. Locate the line in the file that starts with nmConnect.
2. Change the last parameter from plain to SSL.

For example, in `start_adminserver_template.py`, change the line:

```
nmConnect('admin', nmpwd, 'localhost', '5556', 'IDMDomain' , '/u01/oracle/
config/domains/IDMDomain' , 'Plain')
```

to

```
nmConnect('admin', nmpwd, 'localhost', '5556', 'IDMDomain' , '/u01/oracle/
config/domains/IDMDomain' , 'SSL')
```

3. Save the file.

16.8.5.5 Enable Host Name Verification Certificates for Node Manager

This section describes how to set up host name verification certificates for communication between Node Manager and the Administration Server. It consists of the following steps:

- Generate Self-Signed Certificates Using the utils.CertGen Utility (page 16-49)
- Create an Identity Keystore Using the utils.ImportPrivateKey Utility (page 16-50)
- Create a Trust Keystore Using the Keytool Utility (page 16-51)
- Configure Node Manager to Use the Custom Keystores (page 16-52)
- Configure Managed Oracle WebLogic Servers to Use the Custom Keystores (page 16-52)
- Change the Host Name Verification Setting for the Managed Servers (page 16-53)

16.8.5.5.1 Generate Self-Signed Certificates Using the utils.CertGen Utility

The certificates added in this section (as an example) address a configuration where Node Manager listens on a physical host name (*HOST*.mycompany.com) and a WebLogic Managed Server listens on a virtual host name (*VIP*.mycompany.com). Whenever a server is using a virtual host name, 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 reside on a shared storage that is accessible from the failover. If additional host names are used in the same or different nodes, the steps in this example must be extended to:

1. Add the required host names to the certificate stores (if they are different from *HOST*.mycompany.com and *VIP*.mycompany.com).
2. Change the identity and trust store location information for Node Manager (if the additional host names are used by Node Manager) or for the servers (if the additional host names are used by Managed Servers).

Follow these steps to create self-signed certificates on *HOST*. These certificates should be created using the network name or alias. The following examples configure certificates for *HOST*.mycompany.com and *VIP*.mycompany.com; that is, it is assumed that both a physical host name (*HOST*) and a virtual host name (*VIP*) are used in *HOST*. It is also assumed that *HOST*.mycompany.com is the address used by Node Manager and *VIP*.mycompany.com is the address used by a Managed Server or the Administration Server. This is the common situation for nodes hosting an Administration Server and a Fusion Middleware component, or for nodes where two Managed Servers coexist with one server listening on the physical host name and one server using a virtual host name (which is the case for servers that use migration servers).

1. Set up the environment by running the *IDM_BASE*`/products/app/wl_server10.3/server/bin/setWLSEnv.sh` script. In the Bourne shell, run the following commands:

   ```
   cd IDM_BASE/products/app/wl_server10.3/server/bin
   . ./setWLSEnv.sh
   ```

   Verify that the *CLASSPATH* environment variable is set:

   ```
   echo $CLASSPATH
   ```

2. Create a user-defined directory for the certificates. For example, create a directory called 'keystores' under the *IDM_CONFIG/domains/IDMDomain* directory. Note that certificates can be shared across WebLogic domains.

   ```
   cd IDM_CONFIG/domains/IDMDomain
   mkdir keystores
   ```

   MANDATORY: 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 (like SSL set up for HTTP invocations, for example).

3. Change directory to the directory that was just created:

   ```
   cd keystores
   ```

4. Using the utils.CerGen tool, create certificates for each Physical and Virtual Host in the topology. For example:

   ```
   java utils.CertGen Key_Passphrase IDMHOST1.mycompany.com_cert
   IDMHOST1.mycompany.com_key domestic IDMHOST1.mycompany.com
   ```

   Other examples include: `IDMHOST2`, `ADMINVHN`, `SOAHOST1VHN`, `SOAHOST2VHN`, `OIMHOST1VHN`, and `OIMHOST2VHN`.

16.8.5.5.2 Create an Identity Keystore Using the utils.ImportPrivateKey Utility

Follow these steps to create an identity keystore on IDMHOST1:

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, *IDM_CONFIG/domains/IDMDomain/keystores*).

   The Identity Store is created (if none exists) when a certificate is imported and the corresponding key into the Identity Store using the `utils.ImportPrivateKey` utility.

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 New_Password -keystore Trust_Keystore -storepass
   Original_Password
   ```

   For example:

   ```
   keytool -storepasswd -new Key_Passphrase -keystore
   appTrustKeyStoreIDMHOST1.jks -storepass changeit
   ```

3. The CA certificate CertGenCA.der is used to sign all certificates generated by the utils.CertGen tool. It is located in the *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 Alias_Name
   -file CA_File_Location -keystore Keystore_Location -storepass
   Keystore_Password
   ```

   For example:

   ```
   keytool -import -v -noprompt -trustcacerts -alias clientCACert -file WL_HOME/
   server/lib/CertGenCA.der -keystore appTrustKeyStoreIDMHOST1.jks -storepass
   Key_Passphrase
   ```

16.8.5.5.3 Create a Trust Keystore Using the Keytool Utility

Follow these steps to create the trust keystore on each host, for example IDMHOST1 and IDMHOST2:

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 keystore directly. Copy the standard Java keystore CA certificates located under the *IDM_BASE*/products/app/wl_server10.3/server/lib directory to the same directory as the certificates. For example:

   ```
   cp IDM_BASE/products/app/wl_server10.3/server/lib/cacerts IDM_CONFIG/domains/
   IDMDomain/keystores/appTrustKeyStoreIDMHOST1.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 New_Password -keystore Trust_Keystore -storepass
   Original_Password
   ```

   For example:

   ```
   keytool -storepasswd -new Key_Passphrase -keystore
   appTrustKeyStoreIDMHOST1.jks -storepass changeit
   ```

3. The CA certificate CertGenCA.der is used to sign all certificates generated by the utils.CertGen tool. It is located in the *IDM_BASE*/products/app/wl_server10.3/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 Alias_Name
   -file CA_File_Location -keystore Keystore_Location -storepass
   Keystore_Password
   ```

   For example:

   ```
   keytool -import -v -noprompt -trustcacerts -alias clientCACert -file
   IDM_BASE/products/app/wl_server10.3/server/lib/CertGenCA.der -keystore
   appTrustKeyStoreIDMHOST1.jks -storepass Key_Passphrase
   ```

16.8.5.5.4 Configure Node Manager to Use the Custom Keystores

To configure Node Manager to use the custom keystores, add the following lines to the end of the `nodemanager.properties` file located in the *`IDM_CONFIG`*`/nodemanager/`*`hostname`* directory, where *`hostname`* is the name of the host where nodemanager runs:

```
KeyStores=CustomIdentityAndCustomTrust
CustomIdentityKeyStoreFileName=Identity_Keystore
CustomIdentityKeyStorePassPhrase=Identity_Keystore_Password
CustomIdentityAlias=Identity_Keystore_Alias
CustomIdentityPrivateKeyPassPhrase=Private_Key_Used_When_Creating_Certificate
```

For example:

```
KeyStores=CustomIdentityAndCustomTrust
CustomIdentityKeyStoreFileName=IDM_CONFIG/domains/IDMDomain/keystores/
appIdentityKeyStore.jks
CustomIdentityKeyStorePassPhrase=Key_Passphrase
CustomIdentityAlias=appIdentityIDMHOST1
CustomIdentityPrivateKeyPassPhrase=Key_Passphrase
```

The passphrase entries in the `nodemanager.properties` file get encrypted when Node Manager is started, as described in Start and Stop Components (page 10-26). For security reasons, minimize the time the entries in the `nodemanager.properties` file are left unencrypted. After editing the file, start Node Manager as soon as possible so that the entries get encrypted.

16.8.5.5.5 Configure Managed Oracle WebLogic Servers to Use the Custom Keystores

Follow these steps to configure the identity and trust keystores for *WLS_SERVER*:

1. Log in to Oracle WebLogic Server Administration Console at: `http://ADMIN.mycompany.com/console`
2. Click **Lock and Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Click the name of the server for which the identity and trust keystores (*WLS_SERVER*) are configured. The settings page for the selected server is displayed.
6. Select **Configuration**, then **Keystores**.
7. 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.
8. In the Identity section, define attributes for the identity keystore:
   - **Custom Identity Keystore:** The fully qualified path to the identity keystore:

     `IDM_CONFIG``/domains/IDMDomain/keystores/appIdentityKeyStore.jks`
   - **Custom Identity Keystore Type:** Leave blank; it defaults to JKS.
   - **Custom Identity Keystore Passphrase:** The password (*`Keystore_Password`*) provided in Create a Trust Keystore Using the Keytool Utility (page 16-51). This attribute is optional or required depending on the type of keystore. All

keystores require the passphrase to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. WebLogic Server only reads from the keystore, so whether this property is defined or not depends on the requirements of the keystore.

9. In the Trust section, define properties for the trust keystore:
   - **Custom Trust Keystore:** The fully qualified path to the trust keystore:

     `IDM_CONFIG/domains/IDMDomain/keystores/appTrustKeyStoreIDMHOST1.jks`
   - **Custom Trust Keystore Type:** Leave blank; it defaults to JKS.
   - **Custom Trust Keystore Passphrase:** The password provided as *New_Password* in Create a Trust Keystore Using the Keytool Utility (page 16-51). This attribute is optional or required depending on the type of keystore. All keystores require the passphrase to write to the keystore. However, some keystores do not require the passphrase to read from the keystore. WebLogic Server only reads from the keystore, so whether this property is defined or not depends on the requirements of the keystore.
10. Click **Save**.
11. Click **Activate Changes** in the Administration Console's Change Center to make the changes take effect.
12. Select **Configuration**, then **SSL**.
13. Click **Lock and Edit**.
14. In the **Private Key Alias** field, enter the alias used for the host name the Managed Server listens on, for example:
    - For `wls_ods1`, use `appIdentityIDMHOST1`.
    - For `wls_ods2` use `appIdentityIDMHOST2`.
    - For `ADMINSERVER` use `appIdentityADMINVHN`.

    In the **Private Key Passphrase** and the **Confirm Private Key Passphrase** fields, enter the password for the keystore created in Create an Identity Keystore Using the utils.ImportPrivateKey Utility (page 16-50).
15. Click **Save**.
16. Click **Activate Changes** in the Administration Console's Change Center to make the changes take effect.
17. Restart the server for which the changes have been applied, as described in Start and Stop Components (page 10-26).

16.8.5.5.6 Change the Host Name Verification Setting for the Managed Servers

Once the previous steps have been performed, set host name verification for the affected Managed Servers to `Bea Hostname Verifier`. To do this, perform the following steps:

1. Log in to Oracle WebLogic Server Administration Console. Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27).
2. Select **Lock and Edit** from the change center.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.

5. Select the Managed Server in the Names column of the table. The settings page for the server is displayed.
6. Open the SSL tab.
7. Expand the **Advanced** section of the page.
8. Set host name verification to `Bea Hostname Verifier`.
9. Click **Save**.
10. Click **Activate Changes**.

16.8.5.6 Update boot.properties Files

Each managed server has a `boot.properties` file which is created as part of the process described in previous sections. In order to start managed servers using the provisioning start script, update each of these files and comment out following line:

```
TrustKeyStore=DemoTrust
```

After finishing updating the file, the line should look like this:

```
#TrustKeyStore=DemoTrust
```

The files that must be updated are:

IDM_CONFIG/domains/IDMDomain`/servers/AdminServer/security/boot.properties`

and each Managed Server `boot.properties` file. These have path names of the form:

IDM_CONFIG/domains/IDMDomain`/servers/`*servername*`/security/boot.properties`

and

IDM_CONFIG/domains/IDMDomain`/servers/AdminServer/data/nodemanager/boot.properties`

16.8.5.7 Start Node Manager

- Run the following commands to start Node Manager.

  ```
  cd IDM_CONFIG/nodemanager/hostname
  ./startNodeManagerWrapper.sh
  ```

Verify that Node Manager is using the appropriate stores and alias from the Node Manager output. The following should be seen when Node Manager starts.:

```
<Loading identity key store:
  FileName=IDM_CONFIG/domains/IDMDomain/keystores/appIdentityKeyStore.jks,
Type=jks, PassPhraseUsed=true>
```

Host name verification works if a test configuration change is applied to the servers and it succeeds without Node Manager reporting any SSL errors.

16.9 Install and Configure Oracle Business Intelligence Applications

Oracle Business Intelligence Applications consists of pre-built metadata, dashboards, analyses, and ETL tools that provide insight into the organization's historical data. The Oracle Business Intelligence Applications software binaries are installed during Oracle Fusion Applications installation and provisioning in the Oracle Home for Business Intelligence. Set up the Oracle Business Intelligence Applications components before using them. See Installing and Setting Up Oracle BI Applications in the *Oracle Business Intelligence Applications Installation Guide*.

16.10 Configure Oracle Transactional Business Intelligence

After installing Oracle Fusion Transactional Business Intelligence, configure it to obtain real-time analysis of the organization's day-to-day operational data. For information on setting up accounting segment, modeling Essbase cubes, and setting up Descriptive Flexfields see the *Oracle Fusion Transactional Business Intelligence Administrator's Guide*.

16.11 Set Up Report Delivery Servers

Oracle Business Intelligence Publisher is the report generation and delivery engine for Oracle Fusion Applications. Oracle BI Publisher receives report requests from Oracle Fusion Applications in the following ways:

- Through Oracle Enterprise Scheduler
- Through the Reports and Analytics pane
- From an application page

Requests submitted through Oracle Enterprise Scheduler are processed by the Oracle BI Publisher scheduler. Requests submitted through the Reports and Analytics pane can be either real-time online requests or scheduled requests. Requests submitted through an application may invoke Oracle Enterprise Scheduler or may return report request results directly back to the application page.

After installing Oracle Fusion Applications, Oracle BI Publisher is configured to accept requests from Oracle Fusion Applications. However, before delivering report documents to their destinations, define the delivery servers in Oracle BI Publisher. Use the Oracle BI Publisher Administration page to define the delivery servers.

After setup, configure the number of report processor and delivery threads to best handle the processing and delivery requirements. In addition, configure report properties for the system or at the report level to tune performance of the reports. To diagnose report processing issues, BI Publisher provides a set of scheduler diagnostics.

16.11.1 Navigate to the Oracle BI Publisher Administration Page

Use the Oracle BI Publisher Administration page to:

- Configure delivery servers

- Manage report and delivery processors
- View scheduler diagnostics
- Set system properties and report runtime configuration properties

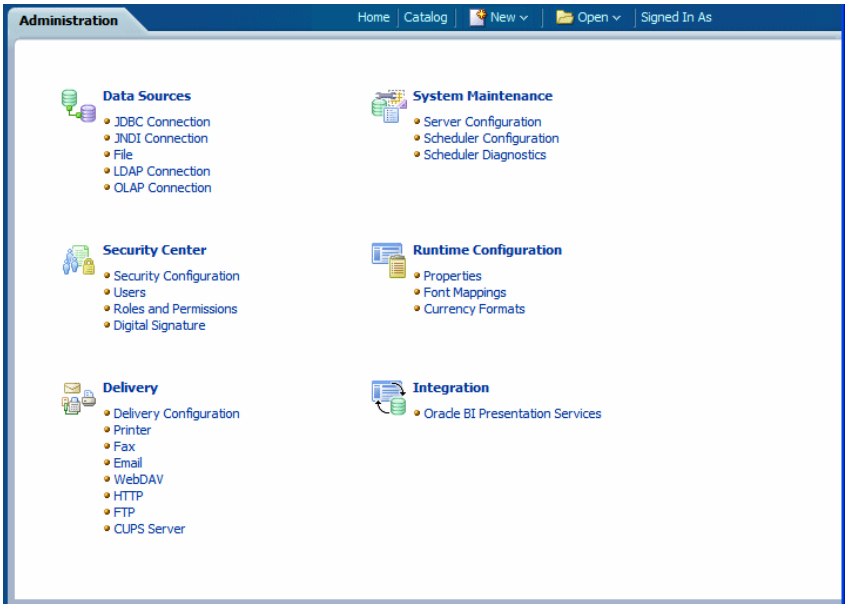
The `BIAdministrator` role is necessary to access the BI Publisher Administration page.

To navigate to the Oracle BI Publisher Administration page:

- From the Oracle Fusion Applications **Navigator**, under **Tools**, click **Reports and Analytics**. In the **Reports and Analytics** pane, click **Catalog** to display the Oracle Business Intelligence presentation catalog page. From here, click **Administration** and then click **Manage BI Publisher**.
- Alternatively, log in to Oracle Business Intelligence directly (example: `http://example.com:port/analytics`). Click **Administration** and then click **Manage BI Publisher**.

Figure 16-2 (page 16-56) shows the BI Publisher Administration page:

Figure 16-2 BI Publisher Administration Page

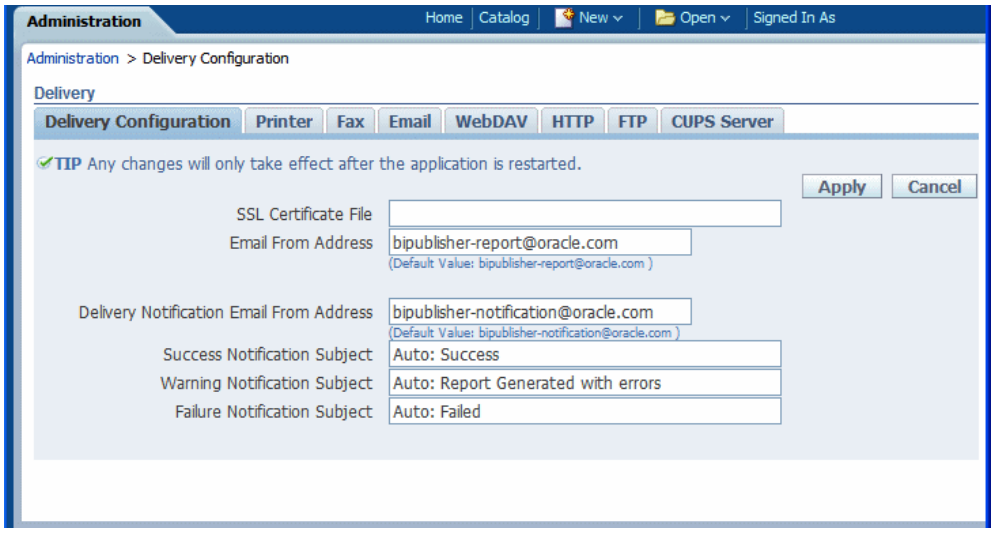


16.11.2 Configure Report Delivery Servers

To configure delivery servers:

1. From the BI Publisher Administration page, click **Delivery Configuration**.
2. Enter values in the **Delivery Configuration Options** tab to set general properties for email deliveries and notifications. Figure 16-3 (page 16-57) shows the Delivery Configuration Options tab:

Figure 16-3 Delivery Configuration Options Tab



For more information about this tab see Configuring Delivery Options in the *Oracle Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher (Oracle Fusion Applications Edition)*.

3. To configure a delivery server, click the appropriate tab.

The following table lists the report delivery channels supported by Oracle BI Publisher. See Setting Up Delivery Destinations in the *Oracle Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher (Oracle Fusion Applications Edition)* for configuration information.

Delivery Type	Section
Printer and Fax	Adding a Printer or Fax Server
E-mail	Adding an E-mail Server
WebDAV	Adding a WebDAV Server
HTTP	Adding an HTTP Server
FTP	Adding an FTP Server

Note that printing is supported through Internet Printing Protocol (IPP). If Oracle BI Publisher is operating in a UNIX environment, set up the Common UNIX Printing Service (CUPS) and then define the CUPS server to Oracle BI Publisher. For information on setting up CUPS and Windows IPP, see Setting Up a Printer in the *Oracle Fusion Middleware Administrator's Guide for Oracle Business Intelligence Publisher (Oracle Fusion Applications Edition)*.

16.12 Configure Oracle Data Integrator Studio

Configuring Oracle Data Integrator Studio for external authentication is necessary to prevent any unauthorized access. The access credentials are stored in a configuration file. To make the external configuration work, the jps configuration file (jps-config.xml) must be configured and placed in the prescribed directory where the application is installed.

Prerequisites

- Select the Developer Installation options on the Select Installation Type page:
  - **ODI Studio (with local agent)**
  - **ODI SDK**
- Skip Repository Configuration on the Repository Configuration page

  MANDATORY: Oracle Data Integrator Studio must be installed in a separate Oracle home other than Oracle Fusion Middleware Oracle homes and Oracle Fusion Applications Oracle home.

For more information about installing Oracle Data Integrator, see Preparing to Install and Configure Oracle Data Integrator in the *Fusion Middleware Installing and Configuring Oracle Data Integrator*.

16.13 Set Up the Oracle Business Intelligence Administration Tool

Oracle Business Intelligence Administration Tool is a part of the Oracle Business Intelligence Client Tools and is packaged along with the Oracle Business Intelligence Applications. It enables to manage the metadata repository and is required for certain steps in the Oracle Business Intelligence Applications setup process. For more information about setting up the Oracle Business Intelligence Administration Tool, see Installing and Setting Up Oracle BI Applications in the *Oracle Business Intelligence Applications Installation Guide*

16.14 Perform Optional Language Installations

This section describes how to install a language other than US English, using Language Pack Installer. See Select Languages (page 3-11) for a list of available languages.

A language pack for a given language and release contains artifacts at the specific release level that are translated to the specific language. Translated artifacts include Oracle Fusion Applications seed data that is uploaded into Oracle Fusion Applications database, SOA resource bundles, JEE resource bundles, LDAP data, Diagnostics Test Framework, and BI Presentation Catalog data. Install language packs with Language Pack Installer.

This section includes the following topics:

- Pre-Installation Steps - Before Down Time (page 16-58)
- Pre-Installation Steps - During Down Time (page 16-60)
- Install a Language (page 16-61)
- Complete the Post-Installation Tasks (page 16-70)
- Troubleshoot Language Pack Installer Sessions (page 16-72)

16.14.1 Pre-Installation Steps - Before Down Time

This section describes the preparation steps for installing a language pack, all of which can be performed before the scheduled down time.

16.14.1.1 Before Beginning

Follow the steps in this section before beginning the language pack installation.

1. Ensure there is access to the *Oracle Fusion Applications NLS release notes* from the current release.
2. Ensure that the steps in Download Language Pack Software (page 5-27) have been followed.

16.14.1.2 Confirm the Oracle Fusion Applications Installation is Complete

Ensure that all tasks described in Complete Mandatory Common Post-Installation Tasks (page 15-1) have been followed.

If a language pack is being installed on an upgraded environment, ensure to complete that all tasks described in Run Post-Upgrade Tasks in the *Oracle Fusion Applications Upgrade Guide*.

In either case, perform also the steps in Post-Installation in the *Technical Known Issues, Oracle Fusion Applications Release 12* document.

16.14.1.3 Maintain Versions of Customized BI Publisher Reports

If a language pack is installed immediately after the Oracle Fusion Applications installation, skip this step.

If a language pack is installed at a later stage, ensure to have the versions of any customized BI Publisher reports. If a language pack includes an update to a catalog object that was delivered with an Oracle Fusion application, the update overwrites any customizations applied to the original report.

16.14.1.4 Run Health Checker for Pre-Down Time Checks

Run Health Checker directly from *APPLICATIONS_BASE* and from the primordial host. Run these checks any number of times prior to the down time. For information about the checks that Health Checker runs, see Language Pack Readiness Health Checks in the *Oracle Fusion Applications Upgrade Guide*.

Perform the following steps to run Health Checker:

1. Set the `APPLICATIONS_BASE` environment variable to point to the directory that contains Oracle Fusion Applications. For example, if Oracle Fusion Applications is installed in `/server01/APPLICATIONS_BASE/fusionapps`, then set the `APPLICATIONS_BASE` environment variable to `/server01/APPLICATIONS_BASE`.

   Examples follow:

   ```
   UNIX:
   setenv APPLICATIONS_BASE /server01/APPTOP/
   ```

2. Run Health Checker. Note that this is one command.

   ```
   UNIX:
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/bin/hcplug.sh -manifest
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/config/
   LanguagePackReadinessHealthChecks.xml [-DlogLevel=log_level]
   ```

If any health checks fail, refer to the Health Checker log files and reports to find the corrective actions to resolve the issue. The suggested corrective actions must be run manually to fix the issue before proceeding with the upgrade. Then rerun Health Checker to ensure all checks are successful. Optionally, use the -checkpoint true option when Health Checker is restarted, so that only the failed plug-ins or the plug-ins that did not run are executed.

Review the Health Checker log file or the HTML summary report to see if any errors occurred that require corrective action. The log file and the HTML summary are located in *APPLICATIONS_CONFIG*/lcm/logs/*release_version*/healthchecker.

16.14.2 Pre-Installation Steps - During Down Time

This section describes the mandatory preparation steps for installing a language pack, all of which must be performed during the system down time. Language Pack Installer does not require any servers to be shut down. However, no users should be online, so it is still considered to be down time.

16.14.2.1 Run Health Checker for General System Health Checks

Run Health Checker directly from *APPLICATIONS_BASE* and from the primordial host. For information about the checks that Health Checker runs, see General System Health Checks in the *Oracle Fusion Applications Upgrade Guide*.

Perform the following steps to run Health Checker:

1. Set the APPLICATIONS_BASE environment variable to point to the directory that contains Oracle Fusion Applications. For example, if Oracle Fusion Applications is installed in /server01/APPLICATIONS_BASE/fusionapps, then set the APPLICATIONS_BASE environment variable to /server01/APPLICATIONS_BASE.

   Examples follow:

   ```
   UNIX:
   setenv APPLICATIONS_BASE /server01/APPTOP/
   ```

2. Run Health Checker. Note that this is one command.

   ```
   UNIX:
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/bin/hcplug.sh -manifest
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/config/
   GeneralSystemHealthChecks.xml [-DlogLevel=log_level]
   ```

If any health checks fail, refer to the Health Checker log files and reports to find the corrective actions to resolve the issue. The suggested corrective actions must be run manually to fix the issue before proceeding with the upgrade. Then rerun Health Checker to ensure all checks are successful. Optionally, use the -checkpoint true option when Health Checker is restarted, so that only the failed plug-ins or the plug-ins that did not run are executed.

Review the Health Checker log file or the HTML summary report to see if any errors occurred that require corrective action. The log file and the HTML summary are located in *APPLICATIONS_CONFIG*/lcm/logs/*release_version*/healthchecker.

16.14.2.2 Back Up Oracle Fusion Applications

Back up the entire Oracle Fusion Applications environment by following the steps in Back Up and Recover Oracle Fusion Applications in the *Oracle Fusion Applications Administrator's Guide*. You should also back up your central inventory.

16.14.2.3 Apply Mandatory Prerequisite Patches

Apply any patches listed in Post-Installation in the *Oracle Fusion Applications release notes* that might have been downloaded in Download Language Pack Software (page 5-27).

16.14.3 Install a Language

Language Pack Installer does not require any servers to be shut down. However, no users should be online, so it is still considered to be down time. Oracle recommends that language packs be installed from a machine that is co-located in the same subnetwork as the database server to maximize performance. Language Pack Installer must be run on the primordial host.

Ensure that the steps in Pre-Installation Steps - Before Down Time (page 16-58) and Pre-Installation Steps - During Down Time (page 16-60) are successfully completed before starting Language Pack Installer.

The policy store can maintain attributes in only one language. To override the base English strings in the policy store, set the `-DupdateJAZNPolicyStore` option to true when the Language Pack is installed. The Description and Displayname are the two attributes which are translatable and are loaded in JAZN files in the Language Pack.

Language Pack Installer supports silent mode and GUI mode. In silent mode, Language Pack Installer reports the progress of the installation as console output. In GUI mode, navigate through screens that display the progress of the installation, including log file locations and status messages.

- Run Language Pack Installer in Silent Mode (page 16-61)
- Run Language Pack Installer in GUI Mode (page 16-64)

16.14.3.1 Run Language Pack Installer in Silent Mode

Perform the following steps to start Language Pack Installer in silent mode from the command line, using specific options to further define the necessary actions. Language Pack Installer must be run from the primordial host.

1. Create a response file named `silent.rsp` to be used in silent mode. This file can be located in any directory that is accessible while launching Language Pack Installer. An example follows:

```
ORACLE_HOME=/u01/APPLICATIONS_BASE/fusionapps/applications
CRM_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
FSCM_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
HCM_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
OBI_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
UCM_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
BPM_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
```

```
SOA_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
B2B_SELECTED_JAZN_MIGRATION_TYPE=PATCH_POLICY
```

The *stripe*_SELECTED_JAZN_MIGRATION_TYPE properties allow to choose which deployment method Language Pack Installer uses for policy store changes to each stripe. The following choices are available:

- PATCH_POLICY: Apply safe changes only. This is the recommended deployment method. Choose this method if there are no conflicts.
- MIGRATE_POLICY_OVERRIDE: Apply all changes and overwrite customizations.
- MIGRATE_POLICY_NO_OVERRIDE: Append additive changes.
- MIGRATE_POLICY_APM: Manually resolve conflicts and upload changes using Authorization Policy Manager (APM).

If PATCH_POLICY or MIGRATE_POLICY_NO_OVERRIDE are chosen, then the results of the analysis must be reviewed to manually upload any changes not applied by Language Pack Installer, based on the selected choice, after the installation is complete. If MIGRATE_POLICY_OVERRIDE was chosen, then the customizations that are overwritten after the installation is complete may need to be reapplied.

If MIGRATE_POLICY_APMis chosen, the installation must be paused while bringing up the APM application and uploading the changes.

Note the location of the following files:

- Baseline file: *FA_ORACLE_HOME*/admin/JAZN/*stripe*/baseline
- Patch file for fscm, crm, and hcm stripes: *FA_ORACLE_HOME*/*stripe*/deploy/system-jazn-data.xml
- Patch file for the obi, ucm, bpm, b2b, and soa stripes: *FA_ORACLE_HOME*/com/acr/security/jazn/bip_jazn-data.xml

2. Set the *JAVA_HOME* environment variable as follows:

   ```
   UNIX: setenv JAVA_HOME APPLICATIONS_BASE/fusionapps/jdk
   ```

3. Confirm the registration of the network location of *FA_ORACLE_HOME*.

   ```
   $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -addLangs -
   jreLoc APPLICATIONS_BASE/fusionapps/jdk/
   -invPtrLoc APPLICATIONS_BASE/fusionapps/applications/oraInst.loc -silent -
   response location_of_response_file -updatesDir installer_patch_directory
   ```

4. Run the following command to start Language Pack Installer in silent mode:

   If Language Pack Installer encounters errors in silent mode during installation, it terminates the session. The issue that caused the failure and then restart Language Pack Installer must be resolved using the same command used previously. Language Pack Installer then restarts from the first failed task. See General Troubleshooting During the Configuration Phase in Silent Mode (page 16-75).

   ```
   UNIX: REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -
   addLangs -jreLoc
   APPLICATIONS_BASE/fusionapps/jdk [-invPtrLoc FA_ORACLE_HOME/oraInst.loc] -
   silent
   -response location_of_silent.rsp_file
   -noCheckForUpdates OR -updatesDir installer_patch_directory
   [-DpatchStageLocation=directory_location_of_patch_stage
   [-Dworkers=number_of_workers][-DlogLevel=level]
   ```

```
[-DserverStartTimeout=timeout_period_for_server_in_seconds]
[-DpatchDownloadLocation=patch_directory][-debug]
```

The following table shows valid options that can be used when running Language Pack Installer in silent mode.

Table 16-2 Language Pack Installer Command Options in Silent Mode

Option Name	Description	Mandatory
`-addLangs`	Runs Language Pack Installer to install one language.	Yes.
`-jreLoc`	Path where the Java Runtime Environment is installed. This option does not support relative paths, so specify the absolute path.	Yes.
`-invPtrLoc` (UNIX platforms only)	The location of an overriding inventory pointer file. If the Oracle Fusion Applications Oracle home directory (*FA_ORACLE_HOME*) is registered in inventory with a `/net` path, then provide the location of `oraInst.loc` including `/net` in the path.	Recommended, use to override the default location of the inventory pointer file, located in `/etc/oraInst.loc`.
`-silent`	Run Language Pack Installer in silent mode.	Yes.
`-response`	The location of the response file, `silent.rsp`.	Yes.
`-noCheckForUpdates`	Skips the application of the installer update patch, if there is no installer update patch available for this release.	No, this option cannot be used if the `-updatesDir` option is used. Either `-noCheckForUpdates` or `-updatesDir` must be used.
`-updatesDir`	The location of the installer update patch. When a valid installer patch is found, the installer automatically restarts itself after applying the patch.	No, this option cannot be used if the `-noCheckForUpdates` option is used. Either `-noCheckForUpdates` or `-updatesDir` must be used.
`-DpatchStageLocation`	Location of patch stage. This is the directory where Middleware patches from a downloaded location, as well as the repository, are consolidated before applying.	No, the default directory is *APPLICATIONS_BASE*`/../patch_stage`.. For example, if *APPLICATIONS_BASE* is `/u01/APPLICATIONS_BASE`, the patch stage directory is `/u01/patch_stage`.
`-DupdateJAZNPolicyStore=true`	Updates the policy store with translated attributes so field descriptions, display names, and other attributes display their translated values.	No, use only when base English is not used in the policy store.

Table 16-2 (Cont.) Language Pack Installer Command Options in Silent Mode

Option Name	Description	Mandatory
`-Dworkers`	The number of workers to use for uploading database content. If a value is provided for the number of workers that is outside the calculated range, a value that is within the optimal range is requested. If this option is not used, a calculated optimal value is used.	No, overrides the default number of workers calculated by Language Pack Installer.
`-DserverStartTimeout`	Configures the timeout value for server in seconds.	No, overrides the default value for server timeout.
`-DpatchDownloadLocation`	The directory path where mandatory prerequisite patches were downloaded to be applied by Language Pack Installer. See Download Language Pack Software (page 5-27).	No, the default is `11.1.11.x.0_post_repo_patches`.
`-DlogLevel`	Records messages in the log file at the level specified. Enter a value to override the default log level of `INFO`.	No, default value is `INFO`.
`-debug`	Retrieve debug information from Language Pack Installer.	No.

5. Proceed to Complete the Post-Installation Tasks (page 16-70)..

16.14.3.2 Run Language Pack Installer in GUI Mode

Perform the following steps to run Language Pack Installer in GUI mode from the command line, using specific options to further define the necessary actions. Language Pack Installer must be run from the primordial host.

If Language Pack Installer encounters errors, refer to Troubleshoot Language Pack Installer Sessions (page 16-72) before clicking any buttons in the Language Pack Installer user interface.

1. Set the *JAVA_HOME* environment variable as follows:

   ```
   UNIX: setenv JAVA_HOME APPLICATIONS_BASE/fusionapps/jdk
   ```

2. Confirm registration of the network location of *FA_ORACLE_HOME*.

   If the Oracle Fusion Applications Oracle home directory (*FA_ORACLE_HOME*), which is *APPLICATIONS_BASE*`/fusionapps/applications`, is registered in the central inventory with a `/net` path, then provide the `oraInst.loc` location including `/net` when starting Language Pack Installer. An example follows:

   ```
   UNIX only:
   $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -jreLoc
   APPLICATIONS_BASE/fusionapps/jdk/
   -invPtrLoc /net/APPLICATIONS_BASE/fusionapps/applications/oraInst.loc
   ```

   If not triggered with a `/net` path, Language Pack Installer copies the `-invPtrLoc` file to *FA_ORACLE_HOME*. This results in a copy of the file to itself, which then becomes an empty or zero byte file. As a result, the copy phase fails when `oracle_common` patches are applied.

3. Run the following command to start Language Pack Installer in GUI mode.

```
UNIX: $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -
addLangs -jreLoc APPLICATIONS_BASE/fusionapps/jdk
[-invPtrLoc FA_ORACLE_HOME/oraInst.loc]
-noCheckForUpdates OR -updatesDir installer_patch_directory
[-DpatchStageLocation=directory_location_of_patch_stage
[-Dworkers=number_of_workers][-DlogLevel=level]
[-DserverStartTimeout=timeout_period_for_server_in_seconds]
[-DpatchDownloadLocation=patch_directory][-debug]
[-DupdateJAZNPolicyStore=true]
```

The following table shows valid options that can be used when running Language Pack Installer.

Table 16-3 Language Pack Installer Command Line Options

Option Name	Description	Mandatory
`-addLangs`	Runs Language Pack Installer to install one language.	Yes.
`-jreLoc`	Path where the Java Runtime Environment is installed. This option does not support relative paths, so specify the absolute path.	Yes.
`-noCheckForUpdates`	Skips the application of the installer update patch, if there is no installer update patch available for this release.	No, this option cannot be used if the `-updatesDir` option is used. Either `-noCheckForUpdates` or `-updatesDir` must be used.
`-updatesDir`	The location of the installer update patch. When a valid installer patch is found, the installer automatically restarts itself after applying the patch.	No, this option cannot be used if the `-noCheckForUpdates` option is used. Either `-noCheckForUpdates` or `-updatesDir` must be used.
`-DpatchStageLocation`	Location of patch stage. This is the directory where Middleware patches from a downloaded location, as well as the repository, are consolidated before applying.	No, the default directory is *APPLICATIONS_BASE*`/../patch_stage`. For example, if *APPLICATIONS_BASE* is `/u01/APPLICATIONS_BASE`, the patch stage directory is `/u01/patch_stage`.
`-invPtrLoc` (UNIX platforms only)	The location of an overriding inventory pointer file. If the Oracle Fusion Applications Oracle home directory (*FA_ORACLE_HOME*), is registered in inventory with a `/net` path, then provide the location of `oraInst.loc` including `/net` in the path.	Recommended, use to override the default location of the inventory pointer file, located in `/etc/oraInst.loc`.

Table 16-3 (Cont.) Language Pack Installer Command Line Options

Option Name	Description	Mandatory
`-Dworkers`	The number of workers to use for uploading database content. If a value is provided for the number of workers that is outside the calculated range, a value that is within the optimal range is requested. If this option is not used, a calculated optimal value is used.	No, overrides the default number of workers calculated by Language Pack Installer.
`-DserverStartTimeout`	Configures the timeout value for server in seconds.	No, overrides the default value for server timeout.
`-DpatchDownloadLocation`	The directory path where mandatory prerequisite patches were downloaded to be applied by Language Pack Installer. See Download Language Pack Software (page 5-27).	No, the default is `11.1.11.x.0_post_repo_patches`.
`-DlogLevel`	Records messages in the log file at the specified level. Enter a value to override the default log level of `INFO`.	No, the default value is `INFO`.
`-DupdateJAZNPolicyStore=true`	Updates the policy store with translated attributes so field descriptions, display names, and other attributes display their translated values.	No, use only when base English is not used in the policy store.
`-debug`	Retrieve debug information from Language Pack Installer.	No.

The following table illustrates the tasks that Language Pack Installer runs. For information about log files and troubleshooting Language Pack Installer errors, see Troubleshoot Language Pack Installer Sessions (page 16-72).

Table 16-4 Language Pack Installer Screen Sequence

Screen	Description and Action Required
Welcome	Appears when Language Pack Installer is started. This screen does not appear if Language Pack Installer is started after a failure. The standard Welcome screen is read-only. It contains a navigation pane on the left-hand side that summarizes the tasks the installer takes. Each item in the pane represents an installer screen, which contains prompts for the necessary information. Click **Next** to continue.
Install Software Updates	Appears when Language Pack Installer is started. This screen does not appear if the `-noCheckForUpdates` option is supplied, or after the installer restarts itself automatically after applying an installer patch. The screen displays two options: • Skip applying the installer update • Search Local Directory for Updates Select **Search Local Directory for Updates**. Specify the correct Installer update patch location or click **Browse** to locate the file. Then click **Search for Updates** to display the patch number and the type of patch. Click **Next** to continue.

Table 16-4 (Cont.) Language Pack Installer Screen Sequence

Screen	Description and Action Required
Installation Location	Specify the location of the existing Oracle Fusion Applications home (*FA_ORACLE_HOME*) where the language is installed. Click **Next** to continue.
Installation Summary	Summarizes the selections made during this installation session. It includes the Oracle home, required and available disk space, and the language to be installed. Review the information displayed to ensure that the installation details are correct. To make changes before installing, click **Back** to return to previous screens in the interview. Click **Install** to start installing this language.
Installation Progress	Displays a progress indicator that shows the percentage of the installation phase that is complete and indicates the location of the installation log file. The installation phase consists of copying files from the language pack to the appropriate Oracle homes. When the installation progress indicator shows 100 percent, click **Next** to continue.

Table 16-4 (Cont.) Language Pack Installer Screen Sequence

Screen	Description and Action Required
Policy Store Analysis (Note that this screen displays only when the `-DupdateJAZNPolicyStore` option is set to `true` when Language Pack Installer is started)	Analysis is available for the following policy store stripes: hcm, crm, fscm, soa, ucm, bpm, b2b,and obi. Select the stripes to be analyzed and then click **Run Analysis** to identify any conflicts or deletions. Only the stripes that are included in the language pack are enabled for analysis and the analysis could run for several minutes. After the analysis runs, review the results of the analysis to determine which deployment method Language Pack Installer should use for policy store changes to each stripe. Oracle recommends to select **Apply safe changes only**. This is the safest method unless the consequences of the other three options have beemn read and totally understood. If it is decided to resolve the conflicts or deletions before the actual JAZN upload from Language Pack Installer, the Policy Store Analysis step should be run again to get the most accurate analysis report. The choices for deployment method are: • Apply safe changes only (choose this method if there are no conflicts). • Apply all changes and overwrite customizations (not available for soa, ucm, b2b, and bpm stripes). • Append additive changes. • Manually resolve conflicts and upload changes using Authorization Policy Manager. If **Apply safe changes only** is selected or **Append additive changes**, then the results of the analysis must be reviewed to manually upload any changes not applied by Language Pack Installer with the selected choice, after the installation is complete. If **Apply all changes and overwrite customizations** is chosen, then the customizations that are overwritten after the installation is complete may need to be reapplied. If one of these options is chosen, click **Next** after making the selection. If **Manually resolve conflicts and upload changes using Authorization Policy Manager** (APM) is selected, the installation must be paused while bringing up the APM application and uploading the changes. Note the location of the following files: • Baseline file: *FA_ORACLE_HOME*`/admin/JAZN/`*stripe*`/baseline` • Patch file for fscm, crm, and hcm stripes: *FA_ORACLE_HOME*`/`*stripe*`/deploy/system-jazn-data.xml` • Patch file for the ucm: *FA_ORACLE_HOME*`/com/acr/security/jazn/ucm_jazn-data.xml` • Patch file for the soa: *FA_ORACLE_HOME*`/com/acr/security/jazn/soa_jazn-data.xml` • Patch file for the bpm: *FA_ORACLE_HOME*`/com/acr/security/jazn/bpm_jazn-data.xml` • Patch file for the obi: *FA_ORACLE_HOME*`/com/acr/security/jazn/bip_jazn-data.xml` When completing this task in APM, shut down the APM application, return to Language Pack Installer, and click **Next**.
Configuration Progress	Displays a progress indicator that shows the percentage of the configuration phase that is complete. It displays each configuration assistant in the message pane as it is performed. No additional user action is required in the Configuration Progress screen unless a failure occurs.

Table 16-4 (Cont.) Language Pack Installer Screen Sequence

Screen	Description and Action Required
Installation Complete	Summarizes the installation just completed. To save this configuration to a response file, click **Save**. To complete a successful installation, click **Finish**. The **Finish** button is activated only if all mandatory configuration assistants completed successfully. To rerun this session after resolving failed configuration assistants, click **Cancel.**

For information about the user interface, see Installer User Interface (page 16-69).

4. Proceed to Complete the Post-Installation Tasks (page 16-70)..

Example 16-1 Language Pack Installation with no policy store translation

```
UNIX: $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -addLangs
-jreLoc APPLICATIONS_BASE/fusionapps/jdk
-invPtrLoc FA_ORACLE_HOME/oraInst.loc
-noCheckForUpdates OR -updatesDir installer_patch_directory
```

Example 16-2 Language Pack Installation with policy store translation

```
UNIX: $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -addLangs
-jreLoc APPLICATIONS_BASE/fusionapps/jdk
-invPtrLoc FA_ORACLE_HOME/oraInst.loc -DupdateJAZNPolicyStore=true
-noCheckForUpdates OR -updatesDir installer_patch_directory
```

Example 16-3 Language Pack installation when FA_ORACLE_HOME is registered with a /net path

```
UNIX: $REPOSITORY_LOCATION/installers/fusionapps/Disk1/runInstaller -addLangs
-jreLoc APPLICATIONS_BASE/fusionapps/jdk
-invPtrLoc /net/APPLICATIONS_BASE/fusionapps/applications/oraInst.loc
-noCheckForUpdates OR -updatesDir installer_patch_directory
```

16.14.3.2.1 Installer User Interface

Language Pack Installer provides a graphical user interface which allows to control the behavior of the installer by the use of buttons, in cases where it encounters a failure. Note that the behavior of these buttons may vary, depending on whether it is a configuration assistant, or a step within a configuration assistant, that fails. The behavior also depends on whether a configuration assistant is mandatory. All mandatory configuration assistants must complete successfully before proceeding to the next configuration assistant. For information about which configuration assistants are mandatory, see Language Pack Installer Configuration Assistants (page 16-73).

Exit out of the installer in the event of a failure and restart from the point of failure. If a non-mandatory configuration assistant fails, and the next configuration assistant continues, restart the installer after it finishes the last configuration assistant. When restarting, the installer retries all failed configuration assistants and steps.

An explanation of the usage of each button follows. Note that the buttons are available only in GUI mode, not in silent mode.

- **Abort Button**

  The **Abort** button allows to skip a failed configuration assistant or step within a configuration assistant, and records the failure so it can be rerun when the

installation is restarted. For mandatory configuration assistants, after aborting the configuration assistant, the installer does not proceed and only the **Cancel** button is enabled. Resolve the cause of the failure and start the installer from this failure point. For non-mandatory configuration assistants, the installer proceeds to the next configuration assistant after aborting the configuration assistant. This button is enabled only after a failure.

- **Cancel Button**

  The **Cancel** button allows to stop an installer session after the failure of a mandatory action. This button is enabled only after a failure.

- **Close Button**

  The Windows **Close** button allows to stop an installer session after a failure. This is enabled only after a failure.

- **Continue Button**

  The **Continue** button allows to skip a failed non-mandatory step within any configuration assistant. The installer records the failure and then proceeds with the next step within the configuration assistant. When this installer session is rerun, the failed steps within the configuration assistant are attempted again.

  Note that this button is enabled only for non-mandatory steps within a configuration assistant.

- **Next Button**

  The **Next** button allows to proceed to the next screen. This button is enabled only when all configuration assistants complete successfully in the current screen.

- **Retry Button**

  The **Retry** button allows to attempt to rerun a failed configuration assistant, or a step within a configuration assistant. Use **Retry** when the cause of the failure is identified the issue can be resolved during the current Language Pack Installer session.

16.14.4 Complete the Post-Installation Tasks

Perform the following required manual steps after Language Pack Installer completes successfully:

- Confirm Database Artifact Deployments Were Successful (page 16-70)
- Review Log Files for Errors or Exceptions (page 16-71)
- Run Health Checker for Post Installation Checks (page 16-71)
- Bounce All Servers and Verify the Status of Deployed Applications (page 16-71)
- Reload Custom Templates for BI Publisher Reports (page 16-72)
- Perform Steps in NLS Release Notes (page 16-72)

16.14.4.1 Confirm Database Artifact Deployments Were Successful

Confirm that all database artifact deployments were successful by reviewing the Diagnostics report and log files. See Diagnostics Report in the *Oracle Fusion Applications Patching Guide*.

16.14.4.2 Review Log Files for Errors or Exceptions

Confirm there are no unresolved errors or exceptions in the log files. For information about resolving errors, see Troubleshoot Language Pack Installer Sessions (page 16-72).

16.14.4.3 Run Health Checker for Post Installation Checks

Run Health Checker to perform post installation checks directly from *APPLICATIONS_BASE* and from the primordial host by performing the following steps. For information about the checks that Health Checker runs, see Post-Upgrade Tasks Performed by Health Checker in the *Oracle Fusion Applications Upgrade Guide*.

1. Set the APPLICATIONS_BASE environment variable to point to the directory that contains Oracle Fusion Applications. For example, if Oracle Fusion Applications is installed in /server01/APPLICATIONS_BASE/fusionapps, then set the APPLICATIONS_BASE environment variable to /server01/APPLICATIONS_BASE.

   Examples follow:

   ```
   UNIX:
   setenv APPLICATIONS_BASE /server01/APPTOP/
   ```

2. Run Health Checker.

   ```
   UNIX:
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/bin/hcplug.sh -manifest
   $APPLICATIONS_BASE/fusionapps/applications/lcm/hc/config/
   PostLanguagePackHealthChecks.xml
   [-DlogLevel=log_level]
   ```

If any health checks fail, refer to the Health Checker log files and reports to find the corrective actions to resolve the issue. The suggested corrective actions must be run manually to fix the issue before proceeding with the upgrade. Then rerun Health Checker to ensure all checks are successful. Optionally, use the -checkpoint true option when Health Checker is restarted, so that only the failed plug-ins or the plug-ins that did not run are executed.

Review the Health Checker log file or the HTML summary report to see if any errors occurred that require corrective action. The log file and the HTML summary are located in *APPLICATIONS_CONFIG*/lcm/logs/*release_version*/healthchecker.

If the JAZN Conflicts check fails, refer to Resolve JAZN Conflicts Found by Health Checker (page 16-79).

16.14.4.4 Bounce All Servers and Verify the Status of Deployed Applications

1. Bounce all servers using the fastarstop script bounce option. See Understand the fastartstop Utility and its Syntax in the *Oracle Fusion Applications Administrator's Guide*.

   If more than one language in an environment are being installed, servers need to be bounced only once at the end of installing all languages in that environment, to minimize time spent bouncing servers.

2. Verify that all deployed applications are up and running. Check this from Fusion Applications Control, or by reviewing the server side log files. See Access Fusion Applications Control in the *Oracle Fusion Applications Administrator's Guide*.

16.14.4.5 Reload Custom Templates for BI Publisher Reports

Follow this step if you have customized BI Publisher reports.

Reload custom templates for BI Publisher reports on Oracle-delivered BI Publisher reports.

16.14.4.6 Perform Steps in NLS Release Notes

Perform any steps listed in Post-Installation Tasks in the *Oracle Fusion Applications NLS release notes*.

16.14.5 Troubleshoot Language Pack Installer Sessions

This section the following topics related to troubleshooting Language Pack Installer sessions.

- Log Directories for Language Pack Installer Tasks (page 16-72)
- Troubleshoot Failures During the Installation Phase (page 16-73)
- Language Pack Installer Configuration Assistants (page 16-73)
- General Troubleshooting During the Configuration Phase in Silent Mode (page 16-75)
- General Troubleshooting During the Configuration Phase in GUI Mode (page 16-75)
- Recovering From a Language Pack Installer Session That Was Shut Down (page 16-78)
- Troubleshoot Applying Middleware Patches (page 16-78)
- Troubleshoot Loading Database Components (page 16-78)
- Troubleshoot Deployment of Applications Policies (page 16-79)
- Troubleshoot Deployment of BI Publisher Artifacts (page 16-79)
- Resolve JAZN Conflicts Found by Health Checker (page 16-79)
- Installer Requirement Checks Fail (page 16-79)
- Language Pack Installer Fails Due To Thread Calls (page 16-79)

16.14.5.1 Log Directories for Language Pack Installer Tasks

The following table provides a list of log directories for Language Pack Installer tasks.

Table 16-5 Log Directories for Language Pack Installer Activities

Log directory name	Description
`INVENTORY_LOC/logs`	Installation phase logs
APPLICATIONS_CONFIG/lcm/logs/11.1.11.x.0/LanguagePack/*language*	Top level directory for Language Pack Installer logs

Table 16-5 (Cont.) Log Directories for Language Pack Installer Activities

Log directory name	Description
APPLICATIONS_CONFIG/lcm/logs/11.1.11.x.0/LanguagePack/*language*/configlogs	Top level log directory for configuration assistants. A log file exists for each configuration assistant.
APPLICATIONS_CONFIG/lcm/logs/11.1.11.x.0/LanguagePack/*language*/PatchManager_DBPatch	Log directory for the **Loading Database Components** configuration assistant
APPLICATIONS_CONFIG/lcm/logs/11.1.11.x.0/LanguagePack/*language*/PatchManager_ActivateLanguage	Log directory for the **Activate Language** configuration assistant
APPLICATIONS_CONFIG/lcm/logs/11.1.11.x.0/LanguagePack/*language*/soalogs	Log files from SOA Composite activities Note that SOA server logs are located under respective domains. For example, the SOA server logs for Common Domain are under *APPLICATIONS_CONFIG*/domains/*hostname*/CommonDomain/servers/soa_server1/logs. See SOA Composite Log Files in the *Oracle Fusion Applications Upgrade Guide*.

16.14.5.2 Troubleshoot Failures During the Installation Phase

For information regarding troubleshooting failures during the language pack installation phase, see Troubleshoot Other Potential Issues During the Upgrade in the *Oracle Fusion Applications Upgrade Guide*.

16.14.5.3 Language Pack Installer Configuration Assistants

During the installation phase, Language Pack Installer copies all files from the language pack to the appropriate locations, such as Oracle Fusion Middleware home and Oracle Fusion Applications Oracle home. After the file copy is completed, Language Pack Installer calls configuration assistants to perform the remaining tasks required to update and deploy the artifacts included in the language pack. Language Pack Installer supports parallel processing of certain configuration assistants to improve performance. Parallel configuration assistants are organized by groups and all configuration assistants in a group start running at the same time. The installer proceeds to the next configuration assistant outside of the group, only after all parallel tasks in a group complete successfully.

All mandatory configuration assistants must complete successfully before proceeding to the next configuration assistant. See General Troubleshooting During the Configuration Phase in Silent Mode (page 16-75) and General Troubleshooting During the Configuration Phase in GUI Mode (page 16-75).

The following table provides a list of possible configuration assistants, including steps within the configuration assistants. The Retry Behavior and Troubleshooting column

describes what Language Pack Installer does after a configuration assistant fails and the **Retry** button is selected or Language Pack Installer is restarted in silent mode. If available, links are provided to relevant troubleshooting sections.

Table 16-6 Configuration Assistants Run by Language Pack Installer

Name	Mandatory	Description	Retry Behavior and Troubleshooting
Activate Language	Yes	Activates the language in the database.	Runs Activate Language again.
Preverification	Yes	Performs the following validation checks: • Policy Store • Check for Number of DB Workers • Database Content Upload • Taxonomy URL • Flexfields • LDAP Data (LDIF) • SOA Resource Bundle	Runs failed steps.
Synchronize Multilingual Tables	Yes	Runs the Maintain Multilingual Tables utility to maintain the tables related to the newly activated language. See Maintaining Multi-lingual Tables in the *Oracle Fusion Applications Patching Guide*.	Restart from failure.
Apply Middleware Language Patches	Yes	• Applies Language Repository Patches • Applies Language Downloaded Patches, as described in Download Language Pack Software (page 5-27).	Applies the failed patches. See Troubleshoot Applying Middleware Patches in the *Oracle Fusion Applications Upgrade Guide*.
Load Database Components	Yes	Uploads the database content packaged in the language pack to the database.	Runs failed database commands. See Troubleshoot Loading Database Components in the *Oracle Fusion Applications Upgrade Guide*.
Update Language Release Information	Yes	Updates the language release information in the `AD_LANGUAGES` table.	Starts from the beginning of the task.

Table 16-6 (Cont.) Configuration Assistants Run by Language Pack Installer

Name	Mandatory	Description	Retry Behavior and Troubleshooting
Deploy Applications Policies (jazn-data.xml)	Yes	Performs the deployment of the updated applications policies, based on the selections during the Policy Store Analysis task. This task runs only in case of choosing to override the base English strings in the policy store by using the `-DupdateJAZNPolicyStore` option set to `true` when the language pack is installed.	Deploys the failed stripes. See Troubleshooting Deployment of Applications Policies in the *Oracle Fusion Applications Upgrade Guide*.
Deploy BI Publisher Artifacts	Yes	Using Catalog Manager, deploys BI Publisher artifacts.:	Starts from the beginning of the task. See Troubleshooting Deployment of BI Publisher Artifacts (page 16-79).
Deploy Flexfields	No	Deploys flexfields to the domain that hosts the `FndSetup` application.	Starts from the beginning of the task.
Deploy LDAP Data (LDIF)	Yes	Uploads LDIF XLIFF translations to the identity store	Retries failed XLIFF files.
Deploy SOA Resource Bundles	Yes	Deploys SOA Resource Bundles to the corresponding SOA servers.	Deploys failed SOA resource bundles.
Activate SOA Language	Yes	Runs the SOA Human Workflow configuration script to activate the language of the language pack.	Starts from the beginning of the task.

16.14.5.4 General Troubleshooting During the Configuration Phase in Silent Mode

The installer can be restarted to rerun all failed configuration tasks as well as those tasks that were not started from the previous session. When a mandatory configuration task or step fails in silent mode, the installer exits. After resolving the issue that caused the failure, restart the installer using the same command used to start it. When the installer restarts, it restarts from the first failed task.

If any non-mandatory tasks fail in silent mode, the installer continues with the next configuration task and does not exit. Review the logs to find any non-mandatory tasks that failed and then rerun the installer until all tasks complete successfully.

If the installer is run in GUI mode, start it from the *`REPOSITORY_LOCATION`*`/installers/fusionapps/Disk1` directory.

16.14.5.5 General Troubleshooting During the Configuration Phase in GUI Mode

This section describes the following troubleshooting scenarios:

- Restart a Failed Installer Session (page 16-76)
- Troubleshoot Failures While Parallel Tasks Are Running (page 16-76)
- The Next Button Is Not Enabled During Configuration Assistants (page 16-77)
- The OPSS Security Store Goes Down While the Installer is Running (page 16-77)
- Failure During Opening of Wallet Based Credential Store (page 16-77)
- Error While Loading Database Components in GUI Mode (page 16-78)

16.14.5.5.1 Restart a Failed Installer Session

The installer can be restarted to rerun all failed configuration assistants as well as those configuration assistants that were not started from the previous session. When a configuration assistant or step fails, the Configuration Progress screen displays the location of the log file and the exception that caused the failure. View the content of the log files that appear at the bottom of the screen to obtain detailed information to assist in diagnosing the cause of the failure.

If one or more failures occur during the configuration phase, after the final configuration assistant is complete, the following message displays:

Configuration is completed with errors, exit the installer by clicking the 'Cancel' button and retry the failed configurations.

Perform the following steps to rerun the installer and retry the failed configuration assistants:

1. Click **Cancel** to exit the installer.
2. Resolve the issues that caused the failure.
3. Start the installer using the same command syntax used for the previous incomplete installation.
4. A pop up dialog displays, asking to continue or not the previous incomplete installation. Select **Yes** to continue running the previous session. If **No** is selected, the installer starts from the beginning and it fails, indicating that a release cannot be installed again in the same environment. Restore then from the backup and restart the installer.
5. The Configuration Progress screen displays only the failed and remaining configuration assistants, and then runs these configuration assistants.
6. Assuming all configuration assistants complete successfully, click **Next** to go to the Installation Complete screen and then click **Finish** to end the session. If a configuration assistant fails again and to attempt to run the session again, click **Cancel** to save the session. If all configuration assistants completed successfully, click **Finish** to end the session.

16.14.5.5.2 Troubleshoot Failures While Parallel Tasks Are Running

If one or more tasks in a group fail, select the failed tasks in any combination, and the **Abort**, **Retry**, and **Continue** buttons are enabled as appropriate for the selected tasks. For example, if two tasks in a group fail, and the first task allows to select **Continue**, but the other task does not, then the **Continue** button is not enabled if both tasks are selected.

Process one or more failed tasks at a time. For example, if three tasks fail, retry one of them, and abort the second task while it is running. Then, retry the third task.

When the first and third tasks finish processing, the next step depends on whether the second task is mandatory. If it is a mandatory task, the installer stops, and if it is non-mandatory the installer continues with the next task after the group. It is also possible to pick two out of three or all three tasks and select **Retry**, **Abort,** or **Continue**, based on which buttons are enabled.

Note that all tasks in a group must either fail or complete successfully before the **Cancel** button is enabled.

16.14.5.5.3 The Next Button Is Not Enabled During Configuration Assistants

Problem

On the Configuration Progress page of the installer, the **Next** button is enabled only when all configuration assistants are successful.

If all the configuration assistants are complete, and the **Next** button is not enabled, then a configuration failure has been encountered and continued to the next configuration assistant.

Solution

In this case, retry the failed configuration assistants by following these steps:

1. On the Configuration Progress page of the installer, click **Cancel**.
2. Restart the installer. All failed configuration assistants or steps rerun upon restart. See Restart a Failed Installer Session (page 16-76).

As long as a configuration assistant is not successful, the **Next** button remains disabled. It may be necessary to repeat the cancel and retry procedure until all configuration assistants are successful.

16.14.5.5.4 The OPSS Security Store Goes Down While the Installer is Running

Problem

The OPSS Security Store goes down while the installer is running.

Solution

Configuration tasks that are related to the OPSS Security Store fail if the store goes down. Perform the following steps to recover:

1. Abort the failed configuration task.
2. Select **Cancel** to end the installer session.
3. Start the OPSS Security Store. See Start Oracle Internet Directory in the *Oracle Fusion Applications Upgrade Guide*.
4. Start a new installer session. The installer resumes with the remaining tasks because **Cancel** is selected, which saves the session.

16.14.5.5.5 Failure During Opening of Wallet Based Credential Store

Problem

The following error occurs during the configuration phase.

```
Reason:oracle.security.jps.service.credstore.CredStoreException: JPS-01050:
Opening of wallet based credential store failed.
Reason java.io.IO Exception: PKI-02002: Unable to open the wallet. Check
password.
```

Solution

After resolving the cause of the failure, cancel the installation and then restart the installer.

16.14.5.5.6 Error While Loading Database Components in GUI Mode

Problem

Language Pack Installer reports that one or more database workers failed during the **Loading Database Components** configuration assistant.

Solution

Use AD Controller to manage the failed workers. After resolving the issue that caused the workers to fail and restarting the failed worker, click **OK** in the dialog box and Language Pack Installer continues processing. See Troubleshoot Patching Sessions for Database Content in the *Oracle Fusion Applications Patching Guide*.

16.14.5.6 Recover From a Language Pack Installer Session That Was Shut Down

Problem

A Language Pack Installer session was shut down during the upgrade.

Solution

If tasks spawned by Language Pack Installer are killed in the middle of any process, the system may not be in a recoverable state and the state should be carefully reviewed by Oracle Support before proceeding.To recover from this situation, restore the backup of *`APPLICATIONS_BASE`* and start from the beginning of the language pack installation.

16.14.5.7 Troubleshoot Applying Middleware Patches

For information about troubleshooting a failure that occurs during the Applying Middleware Patches configuration assistant, see Troubleshoot Applying Middleware Patches in the *Oracle Fusion Applications Upgrade Guide*.

16.14.5.8 Troubleshoot Loading Database Components

For information about troubleshooting a failure that occurs during the Loading Database Components configuration assistant, see Troubleshoot Loading Database Components in the *Oracle Fusion Applications Upgrade Guide*.

16.14.5.9 Troubleshoot Deployment of Applications Policies

For information about troubleshooting failures during the Deployment of Applications Policies configuration assistant, see Troubleshooting Deployment of Applications Policies in the *Oracle Fusion Applications Upgrade Guide*.

16.14.5.10 Troubleshoot Deployment of BI Publisher Artifacts

Problem

The following error occurs if the BI Presentation servers are running during the deployment of BI Publisher artifacts:

```
java.lang.RuntimeException: Webcat patch file creation failed!
```

Solution

If the language pack contains BI Publisher artifacts, the BI Presentation servers must not be running. To resolve this issue, shut down the BI Presentation servers to release locks on the Oracle BI Presentation Catalog. See fastartstop Syntax in the *Oracle Fusion Applications Administrator's Guide*.

16.14.5.11 Resolve JAZN Conflicts Found by Health Checker

This step is performed by Health Checker only if the `-DupdateJAZNPolicyStore` option is set to true.

Health Checker checks the JAZN Analysis reports for potential conflicts and deletions that are not patched automatically by Language Pack Installer.

16.14.5.12 Installer Requirement Checks Fail

Problem

The installer fails with the following type of errors:

```
Starting Oracle Universal Installer...
Checking if CPU speed is above 300 MHz.
Checking Temp space: must be greater than 4096 MB. Actual 9177 MB Passed

Checking swap space: 3915 MB available, 4000 MB required. Failed <<<<
Some requirement checks failed. You must fulfill these requirements before
continuing with the installation,
```

Solution

Manually increase the requirement check that failed, in this example, the swap space. Then restart Language Pack Installer.

16.14.5.13 Language Pack Installer Fails Due To Thread Calls

Problem

Language Installer fails due to thread calls and reports errors similar to the following example:

```
"Thread-11" id=29 idx=0x98 tid=25751 prio=5 alive, native_blocked
     at java/io/UnixFileSystem.getBooleanAttributes0(Ljava/io/File;)I(Native
 Method)
     at java/io/UnixFileSystem.getBooleanAttributes(UnixFileSystem.java:228)
     at java/io/File.exists(File.java:733)
```

Solution

Restart Language Pack Installer.

16.15 Set Up Segregation of Duties

When a role assignment is requested through Oracle Identity Management, it needs to check with the Application Access Controls Governor to see if there are any segregation of duties (SOD) violations. If Application Access Controls Governor reports any SOD violations, depending on the violation or access issues, Oracle Identity Manager needs to send the request for an approval to specific roles, automatically approve the request, or reject the request.

16.15.1 Set Up SOD

To set up SOD, complete the following procedures.

1. Ensure that the following configuration requirements are met:
   - Set up an Application Access Controls Governor server
   - Set up the Oracle Fusion connector
   - Define a data source
   - Update the Application Access Controls Governor server details in Identity Manager

   Perform all the setup tasks only from the Identity Manager domain.
2. To manually switch from Oracle Identity Management to Lightweight Directory Access Protocol (LDAP) as the source of user roles for Service-Oriented Architecture (SOA) server deployed with Identity Manager, perform the following configuration steps.

   This step is applicable only to the environments set up with Oracle Identity Management and Oracle Access Management integration, and LDAP synchronization of users and roles enabled in Oracle Identity Manager.

   a. Log in to the Enterprise Manager Console as a Weblogic_Administrator user.
   b. Access the Weblogic Domain in which Identity Manager is configured.
   c. Open the **Security** - **Realms** page.
   d. On the Providers tab of the **Security** - **Realms** page, open **OIDAuthenticator**.
   e. In the provider specific parameters for `OIDAuthenticator`, update the Oracle Virtual Directory port with the Oracle Internet Directory port by changing the value of the port from Oracle Virtual Directory port to Oracle Internet Directory port.
   f. On the Providers tab of the security realm settings page, create a new authentication provider with the name OIMSignatureAuthenticationProvider and the type OIMSignatureAuthenticationProvider.

g. Configure `OIMSignatureAuthenticationProvider` with the following parameters:

   `DBDriver: oracle.jdbc.OracleDrive`

   `DBUrl: jdbc:oracle:thin:@<db_hostname>:<db_port>:<db_sid>`.

   `For example, jdbc:oracle:thin:@localhost:5521:iam4`.

   `PKIKeystore Provider: sun.security.rsa.SunRsaSign`

   `Symmetric Key Keystore Provider: com.sun.crypto.provider.SunJCE`

   `DBUser: the Identity Manager database schema user name`

   `DBPassword: the Identity Manager database schema user password`

   These parameters as same as in `OIMAuthenticationProvider`.

h. Delete the existing `OIMSignatureAuthenticator`.

i. Reorder authentication providers into the following sequence:

   OAMIDAsserter

   OIMSignatureAuthenticationProvider

   OIMAuthenticationProvider

   OIDAuthenticator

   DefaultAuthenticator

   DefaultIdentityAsserter

   IDMDomainAgent

j. Disable the **Weblogic** user profile in Identity Manager.

   This user profile must be disabled to avoid the authentication errors at Identity Manager Authenticator level, as Identity Manager Authenticator is now placed ahead of the Default Authenticator in authentication provider ordering. However, the user profile cannot be disabled from Identity Manager Administration page. Instead, run the following SQL scripts on the OIM database.

   ```
   update usr set usr_status='Disabled' where usr_login='WEBLOGIC';
   ```

   ```
   update usr set usr_disabled=1 where usr_login='WEBLOGIC';
   ```

k. Create the **Weblogic** user profile in LDAP and add it to the **Administrators** role. If the **Administrators** role does not exist in LDAP, create it first and then add the **Weblogic** user profile to it.

   A user can be created in LDAP by creating an LDAP Data Interchange Format (LDIF) file and using the **ldapadd** command.

l. In the jps-config.xml file, locate the element group `<jpsContext name="default">`.

m. Under `<jpsContext name="default">`, locate the identity store element `<serviceInstanceRef ref="idstore.oim"/>`, replace its value with `idstore.ldap` and save the file.

n. Restart all servers in the domain, including the Administration Server.

3. Administer role memberships using the Delegated Administration tasks in Oracle Identity Manager. To apply SOD checks on these administrative actions, configure the following Identity Manager system properties.
   - Set `XL.RM_REQUEST_ENABLED` to `TRUE`
   - Set `XL.RM_ROLE_ASSIGN_TEMPLATE` to `ASSIGN ROLES WITH CALLBACK POLICY`

16.15.2 Turn Off SOD Checks

To turn off the SOD checks, do the following.

1. Log in as an Administrator to the Enterprise Manager application for Oracle Identity Manager server.
2. Navigate to the system MBean browser for the Identity Manager server.
3. Locate `OAACGConfig MBean` option.
4. Set the property `SODEnabled` to `False` and save.
5. Log in to the Identity Manager's advanced console and set the system property `XL.RM_REQUEST_ENABLED` to `False`.
6. Restart the Identity Manager server.

To turn on the SOD checks, set the properties `SODEnabled` and `XL.RM_REQUEST_ENABLED` to `True`.

16.15.3 Modify the Segregation of Duties Routing Policies for Approving Role Provisioning: Procedures

When an access control necessitates an approval, the predefined routing rules determine the approver for a role provisioning request. These rules are defined in the `OAACGRoleAssignSODCheck` composite because of Approval Management Extensions (AMX) functionality such as Supervisory List.

The following rules are used to route the request to the suitable role.

- If the requested role assignment is of Chief Financial Officer, SOD remediation task is assigned to the IT Security Manager role.
- If SOD violation occurs because of a policy where the SOD control perspective is **Business Process** - **Information Technology Management** and the control priority is 1, SOD remediation task is assigned to the Application Administrator role.
- If SOD violation occurs for any other reason (Catch All rule), SOD remediation task is assigned to the Controller role.

To modify these routing rules, do it in two ways:

- Using Oracle SOA Composer
- Using JDeveloper

16.15.4 Modify Rules Using Oracle SOA Composer

Use the Oracle SOA Composer associated with the SOA server used by Oracle Identity Management, and change the `RemediationRules` ruleset associated with

OAACGRoleAssignSODCheck composite. For instance, to shift the task assignment in the Catch All rule from the Controller role to a different role.

1. Log in to the Oracle SOA Composer.
2. Click **Open** - **Open Task**.
3. Select **OAACGRoleAssignSODCheck** and click **Open**.
4. On the ApprovalTaskRules.rules tab, click **Edit**.
5. Expand Catch All and in the **THEN** statement, replace GL_CONTROLLER_JOB with the new role.
6. Save the changes.

16.15.5 Modify Rules Using JDeveloper

Modifications can be made directly to the configuration file available within OAACGRoleAssignSODCheck.zip.

To perform this task, administrative privileges or the role of an Administrator are necessary.

1. Go to *IDM_BASE/products/app/oim*/server/workflows/composites/ and extract the contents of OAACGRoleAssignSODCheck.zip to a directory.
2. Open the application in JDeveloper. See the routing rules in the ruleset RemeditationRules of the ApprovalTaskRules.rules file, where the following SOD related information is available for configuring the rules as part of the task payload element oaacgResponse.
   - hasIssues: Acceptable values are:
     - TRUE: Authorization issues exist but can be remedied
     - FALSE: No authorization issues
     - REJECT: Authorization issues exist but cannot be remedied; request has to be rejected
   - dimensions: List of dimensions and tags that are defined on the controls related to the authorization issues
   - requestedRoles: List of roles that are requested as part of this request
   - existingRoles: List of existing role memberships for the user
   - authIssues: List of Oracle Governance, Risk and Compliance Controls Incident IDs and the following additional details. This information is subsequently required to notify the approval decision.
     - ctrlPriority: Priority of the Oracle Applications Access Control Governor control that resulted in the authorization issue
     - ctrlName: Name of the SOD policy
     - userName: User profile to which the authorization issue belongs
     - roleName: Role associated with the authorization issue
     - sodStatus: Approval status of the request indicating whether the request is approved by Governance, Risk and Compliance Controls, or approved with conditions, or rejected

- issuePath: Information about the entity on which the SOD policy is defined

After the rule modifications, update the following values in the `OAACGRoleAssignSODCheck_cfgplan.xml` configuration plan file.

Value	Description
`@oimT3URL`	The OIM server t3 URL
`@oimServerHost`	The OIM server host name
`@oimServerPort`	The OIM server port number

Thereafter, deploy the modified composite with this updated configuration plan file.

16.15.6 Troubleshoot Segregation of Duties for Role Provisioning: Procedures

The following scenarios may require troubleshooting measures to ensure successful completion of segregation of duties (SOD) checks and approval of role provisioning requests.

16.15.7 Failure of Role Assignment Request

The role assignment request fails and the request gets the Request Failed status. To troubleshoot this, do the following:

1. Log in to the Oracle Identity Management domain in Enterprise Manager.
2. On the home page, under (Service Oriented Architecture), click **OAACGRoleAssignSODCheck** composite.
3. Under Recent Instances, click the latest instance and look for any error message or description of failure of request.
4. Check if the Application Access Controls Governor server information provided in Oracle Identity Manager is correct.
5. On the left pane, click IDM domain and from the context menu select System Mbean Browser.
6. Under Application Defined Mbeans, navigate to `oracle.iam` and select the OIM server and Application OIM.
7. Expand **XML Config** - **Config** - **XMLConfig.OAACGConfig** and select OAACGCOnfig.
8. Ensure that the attribute values used in Host, Port, DataSourceName, Service URL, and UserName are correct. To modify any incorrect information, on the Operations tab, click `updateOAACGConfigInformation` method, and provide the following parameters.

Parameter	Description
host	Application Access Controls Governor host name or IP address
port	Application Access Control Governor port

Parameter	Description
username	Admin username
password	Admin password
serviceURL	Application Access Control Governor service URL Note Ensure that there is a forward slash at the end of the URL. The URL must be in the format /grcc/services/GrccService/.
DatasourceName	Data source name of the Oracle Fusion connector that is configured in Application Access Control Governor

9. After saving the modifications, restart the Oracle Identity Management server.

16.15.8 Task Details Missing

If the task details of the assigned task are not found, perform the following checks to troubleshoot.

1. Ensure that the taskflow is deployed on the SOA server.
   a. Log in to the Weblogic console.
   b. On the left side, under the menu, click **Deployments**.
   c. Ensure that TaskDetails application is deployed to SOA server and its state is Active.
2. Ensure that the predefined Admin user in Oracle Identity Management (OIM) is available in the Oracle Credential Store Framework (CSF), do the following:
   a. Log in to Oracle Identity Management domain in Enterprise Manager.
   b. On the left pane, click **Identity Management domain** and from the context menu, select **Security** - **Credentials**.
   c. Expand **OIM** and check for the key entry `sysadmin`.
   d. Select the entry and click Edit to view the details.
   e. Ensure that the user name is set to `xelsysadm`.

If these steps do not help, refer to the generic troubleshooting tips associated with Oracle Identity Manager.

For generic information about troubleshooting OIM, see Troubleshoot Oracle Identity Management in the *Oracle Fusion Applications Administrator's Guide*.

16.15.9 Configure Oracle Data Integrator Studio for External Authentication: Explained

Configuring Oracle Data Integrator Studio for external authentication is necessary to prevent any unauthorized access. The access credentials are stored in a configuration file. To make the external configuration work, the jps configuration file (jps-config.xml) must be configured and placed in the prescribed directory where the application is installed.

16.15.10 Prerequisites

To configure Oracle Data Integrator Studio, ensure that the following selections were made in the Oracle Data Integrator installation wizard:

- Developer Installation options on the Select Installation Type page:
  - **ODI Studio (with local agent)**
  - **ODI SDK**
- Skip Repository Configuration on the Repository Configuration page

Oracle Data Integrator Studio must be installed in a separate Oracle home other than Oracle Fusion Middleware Oracle homes and Oracle Fusion Applications Oracle home.

16.15.11 Configuration for ESS

In the `<APPLICATIONS_BASE/fusionapps/odi>/oracledi/client/odi/bin` directory, access the file `odi.conf` and update the parameter `AddVMOption -Doracle.odi.studio.ess=true`. This enables ESS configuration properties to be visible in Topology.

16.16 Configure Presence Servers

For an on-premise installation of Oracle Fusion Applications, Microsoft Office Communication Server (OCS) 2007 or Microsoft Live Communication Server (LCS) can be optionally used as the presence server. The setup involves creating external application connections, and instant messaging and presence connections, to OCS or LCS for each Oracle Fusion application.

Prerequisites for OCS or LCS need also to be set up.

This table lists the Java EE applications that can be configured with OCS or LCS.

Product Family or Product	Java EE Application Name
Oracle Fusion Application Customer Relationship Management	• ContractManagementApp • CrmCommonApp • CrmPerformanceApp • CustomerApp • MarketingApp • OrderCaptureApp • SalesApp
Oracle Fusion Applications Human Capital Management	• HcmBenefitsApp • HcmCompensationApp • HcmCoreApp • HcmCoreSetupApp • HcmPayrollApp • HcmTalentApp
Oracle Fusion Applications Projects	ProjectFinancialsApp

Product Family or Product	Java EE Application Name
Oracle Fusion Application Toolkit	HomePageApp

For each application, execute the following commands against the appropriate domain:

- `createExtAppConnection`
- `addExtAppField`
- `createIMPConnection`

Replace placeholder values enclosed within brackets (**< >**) with real values, for the appName, url, poolName, userDomain, and server fields.

- For the appName field, enter the Java EE application name, for example HcmBenefitsApp.
- The userDomain field is required only for the OCS connection and refers to the user domain associated with the OCS installation.
- For the server field, enter the managed server name on which the Java EE application is deployed. This field is optional if there is only one managed server for the application.

16.16.1 createExtAppConnection

Execute this command:

```
createExtAppConnection(appName='<JavaEEApp>', name='IMP_EXT_APP',
displayName='Presence Server Login Credentials')
```

The appName field is environment specific and requires to enter a value.

16.16.2 addExtAppField

Execute this command:

```
addExtAppField(appName='<JavaEEApp>', name='IMP_EXT_APP',
fieldName='Account', fieldValue='', displayToUser=1)
```

The appName field is environment specific and requires to enter a value.

16.16.3 createIMPConnection

If Oracle Fusion Applications is deployed in a high availability configuration, there may be multiple managed servers targeted for each Java EE application. The createIMPConnection command must be run for each application on each server, and specify the server in the server field.

If the LCS adapter is used, then execute this command:

```
createIMPConnection(appName='<JavaEEApp>', name='presence',
adapter='LCS', url='<http://host:port/contextPath>', appId='IMP_EXT_APP',
poolName='<poolNameHere>', timeout=60, default=1,
server='<managedServerName>')
```

If the OCS adapter is used, then execute this command:

```
createIMPConnection(appName='<JavaEEApp>', name='presence',
adapter='OCS2007', url='<http://host:port/contextPath>',
appId='IMP_EXT_APP', userDomain='<example.com>',
poolName='<poolNameHere>', timeout=60, default=1,
server='<managedServerName>')
```

These fields are environment specific and require to enter a value:

- appName
- adapter (**OCS2007** or **LCS**)
- url
- poolName
- default (**1** or **0**)

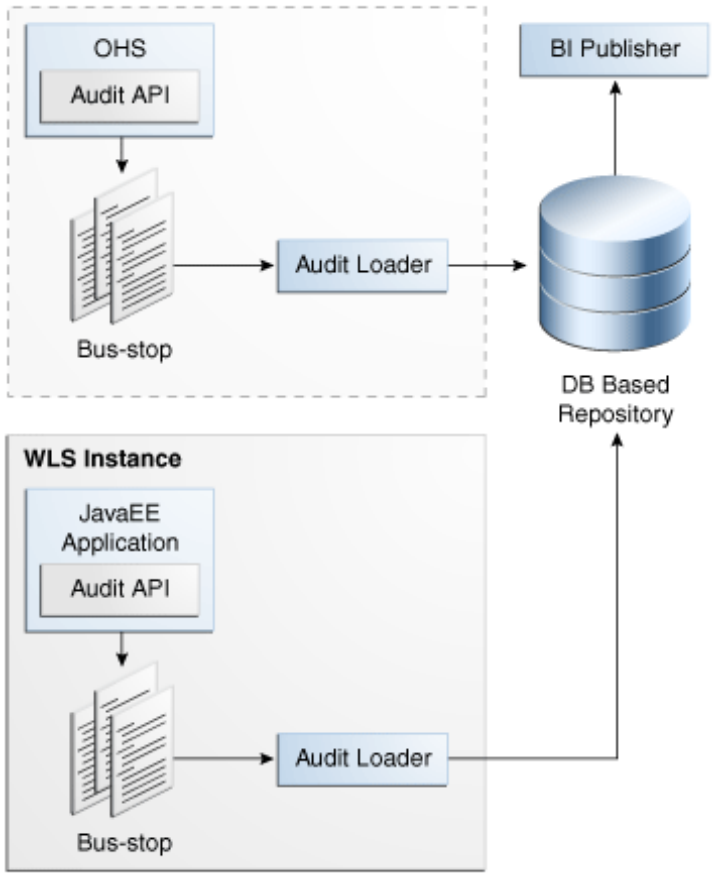
  The connection is not used unless this field is set to 1. If 0 is used, then essentially disable the connection.
- server

16.17 Configure Audit Trails for Oracle Fusion Middleware

The 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. For Oracle Fusion Applications, several Oracle Fusion Middleware products such as Oracle Data Integrator (ODI), Business Intelligence Publisher (BIP), Oracle Platform Security Services (OPSS), Oracle Web Service Management (OWSM), Oracle Business Intelligence Enterprise Edition (OBIEE), and Meta Data Services (MDS) leverage audit trails capability.

Figure 16-4 (page 16-89) is a high-level architectural diagram of the Oracle Fusion Middleware Audit Framework.

Figure 16-4 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 run time, 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 user name 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 WebLogic Scripting Tool (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, the 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:** The audit repository contains a predefined Oracle Fusion Middleware Audit Framework schema, created by Repository Creation Utility (RCU). When 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 over time. 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 to 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 predefined reports in Oracle Business Intelligence Publisher. The reports allow users to drill down the audit data based on various criteria. For example:
  - User name
  - Time range
  - Application type
  - Execution context identifier (ECID)

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 after 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.

16.18 Install Print Servers

Print servers must be installed for external applications as part the implementation activity in Oracle Fusion Applications.

This task is not applicable to Oracle Cloud implementations.

16.18.1 External Applications

Several external applications require specialized print servers. See the related product documentation for installing print servers for these applications.

- Oracle Business Intelligence Financial Reporting Studio and Financial Reporting Print Server.
- Primavera P6 Enterprise Project Portfolio Management.

16.19 Configure Oracle HTTP Server for Privileged Port (UNIX Only with No Load Balancer)

A secondary Oracle HTTP server needs to be added to the Oracle Fusion Applications environment to effectively handle the load and improve the application performance.

Before proceeding with the installation of the secondary HTTP server, ensure that the following prerequisites are met.

- Availability of a free slot to install the secondary HTTP server.

  Usually, the secondary HTTP server is installed on the same slot as the primary HTTP server. In such cases, the webgate used by the primary HTTP server can be used by the secondary HTTP server. However, if the secondary HTTP server is not installed on the same slot as the primary HTTP server, the webgate used by the primary HTTP server is not accessible by the secondary HTTP server. In that case, a separate webgate needs to be installed for the secondary HTTP server.

- Set up a directory structure similar to the directory structure of the primary HTTP server. The directory structure of the primary HTTP server is as follows.

  ```
  First OHS mw home: /slot/ems5905/appmgr/APPLICATIONS_BASE/webtier_mwhome
  First OHS OH: webtier
  First OHS instance dir: /slot/ems5905/appmgr/APPLICATIONS_BASE/instance/
  CommonDomain_webtier/
  First OHS component name: ohs1
  First OHS bin dir: /slot/ems5905/appmgr/APPLICATIONS_BASE/instance/
  CommonDomain_webtier/bin
  First OHS config dir: /slot/ems5905/appmgr/APPLICATIONS_BASE/instance/
  CommonDomain_webtier/config/OHS/ohs1/moduleconf
  ```

  On the same lines, a directory structure can be defined for the secondary HTTP server as shown here:

  ```
  Second OHS mw home: /slot/ems5905/appmgr/APPLICATIONS_BASE/webtier_mwhome2
  Second OHS OH: webtier2
  Second OHS instance dir: /slot/ems5905/appmgr/APPLICATIONS_BASE/instance/
  CommonDomain_webtier2
  Second OHS component name: ohs2
  ```

16.20 Use Default Oracle Database Vault Schemas

This is an optional step. If Oracle Database Vault is intended to be used, use only the default Oracle Database Vault Owner (DVOWNER) and Oracle Database Vault Account (DVACCTMGR) schemas. Custom schemas are not allowed for using Oracle Database Vault. This ensures future smooth migration to Oracle Software As A Service.

16.21 Next Steps

For more information about scale out and server migration for Oracle Fusion Applications, go to Complete Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management (page 17-1). Otherwise, go to the section that corresponds to the product offering that is installed.

17

Complete Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management

This section describes the conditional common high availability post-installation tasks for Oracle Identity Management that must be reviewed and completed as required. This section contains the following topics:

- Introduction to Completing Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management (page 17-1)
- Scale Identity Management (page 17-1)
- Set Up Server Migration for Identity Management (page 17-44)
- Set Up Fail Over for the Administration Server (page 17-51)
- What to Do Next (page 17-55)

17.1 Introduction to Completing Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management

After having successfully completed the conditional common post-installation tasks review and perform the following conditional common high availability tasks.

Some components in the Oracle Fusion Applications environment are dependent on one another. Therefore, it is important to start and stop components in the proper order. In the course of normal IT operations, common operations include shutting down computers and starting them back up. Therefore, it is crucial to start and stop Oracle Fusion Applications in a sequential manner. See Start and Stop an Oracle Fusion Applications Environment in the *Oracle Fusion Applications Administrator's Guide*.

17.2 Scale Identity Management

The Identity Management topology is highly scalable. It can be scaled up and/or scaled out. This section explains how to do so.

To scale up the topology, add a new component instance to a node already running one or more component instances.

To scale out the topology, add new component instances to new nodes.

17.2.1 Scale Up the Topology

The Oracle Identity Management topology described in the guide has three tiers: the Directory Tier, Application Tier and Web Tier. The components in all the three tiers can be scaled up by adding a new server instance to a node that already has one or more server instances running. The procedures described in this section show how to create a new managed server or directory instance.

17.2.2 Scale Out the Topology

Scale out a topology by adding new components to new nodes. The components in all three tiers of the Oracle Identity Management topology described in this section can be scaled out by adding a new component instance to a new node.

17.2.3 Scale Out the Database

The process of scaling out the Oracle Identity Management database involves installing new database instances, which is not described in this guide. The following steps assume that Real Application Clusters (RAC) is used and that the additional database instances have already been configured. For more information about RAC, see Install Oracle Database (page 7-4).

Oracle Identity Management components interface with the database using WebLogic Datasources. In systems that use Oracle RAC, Data sources are configured as Multi Datasources in Identity Management. A multi datasource is made up of several child datasources, one for each RAC database Instance. The Identity Management Applications interface with the RAC database by accessing the parent multi data source. If a new database instance is added, then create new datasources for each of the existing multi datasources and then add the new data source into the pre-existing multi data source. Because different applications use different datasources, add the database to each data source that is using the database.

To do this perform the following steps:

1. Log In to the WebLogic console using the URL: `http://admin.mycompany.com/console`
2. Select **Services**, then **Messaging**, then **Data Sources** from the Domain Structure window.
3. Click on a Data Source which has an ID of the type **Multi**
4. Click on the **Targets** tab and make a note of what targets the multi data source is assigned to.
5. Click on the **Configuration** tab and the **Data Sources** subtab. The chosen box shows what Data sources are currently part of the multi datasource.
6. Select **Services**, then **Messaging**, then **Data Sources** from the Domain Structure window.
7. This time click on one of the data sources that are currently part of the multi datasource.
8. Make a note of the following attributes. (The example shown is the data source EDNDDatasource-rc0, which is part of the multi data source EDNDatasource.)

   General Tab

JNDI Name: for example, `jdbc/EDNDatasource-rc0`

Connection Pool Tab:

- **URL**: for example:
  `jdbc:oracle:thin:@(DESCRIPTION=(ADDRESS_LIST=(ADDRESS=(PROTOCOL=TCP)(HOST=idmdb-scan.mycompany.com)(PORT=1521)))(CONNECT_DATA=(SERVICE_NAME=soa_edg.mycpmpany.com)(INSTANCE_NAME=idmdb1)))`
- **Driver Class**: for example: `oracle.jdbc.xa.client.OracleXADataSource`
- **Properties**: for example:

  `user=FA_SOAINFRA`

  `oracle.net.CONNECT_TIMEOUT=10000`
- **System Properties**: for example: `v$session.program=JDBCProgramName`
- **Password**: This is the database password used when the Oracle Identity Management RCU is ran

9. Return to the Overview screen
10. Click **Lock and Edit**.
11. Click **New**, then **Generic Datasource**
12. Select **Services**, then **Messaging**, then **Data Sources** from the Domain Structure window.
13. Provide the following:
    - **Name**: Choose a name for the datasource for example: `EDNDDatasource-rc3`
    - **JNDI Name**: Enter a jndi name, for example: **jdbc/EDNDatasource-rc3**
    - **Database Type**: `oracle`
14. Click **Next**.
    - **Database Driver**: This can be determined from the Driver class, that is, `xa` or `non xa`. For example: Oracle's Driver (thin XA) for RAC Service-Instance connections; Versions 10 and later
15. Click **Next**.
16. On the Transaction Options page, click **next**.
17. On the Connection Properties page enter:
    - **Service name**: Database service name for example: `soaedg.mycompany.com`
    - **Database Name**: Enter the name of the database for example: `IDMDB`
    - **Host Name**: If this is for an 11.2 database enter the database scan address. Otherwise enter the VIP of the host being added.
    - **Port**: Enter the listener port, for example: `1521`
    - **Database User Name**: enter the value from Properties, for example: `FA_SOAINFRA`
    - Enter the password assigned when the Oracle Fusion Middleware Repository Creation Utility (Oracle Fusion Middleware RCU) was run and confirm it.

    Click **Next**.

18. On the Test Configuration page, test the connection.

    Click Next

19. On the Targets page, assign the same targets as noted for the mutli datasource.
20. Click **Finish**.
21. Now that the datasource has been defined, it can be added to the existing multi datasource.

    Select **Services**, then **Messaging**, then **Data Sources** from the Domain Structure window.

22. Click on the multi datasource, for example: **EDNDDatasource**
23. Click on the **Targets** tab and add the newly created data source.
24. Click **Finish**
25. Click **Activate Changes**
26. Repeat for each data source that uses the database.

17.2.4 Scale the Directory Tier

The Directory tier consists of two LDAP hosts, each running Oracle Internet Directory and Oracle Virtual Directory.

This section contains the following topics:

- Scale Oracle Internet Directory (page 17-4)
- Scale Oracle Virtual Directory (page 17-12)

17.2.4.1 Scale Oracle Internet Directory

The Directory Tier has two Oracle Internet Directory nodes, *LDAP_PROVISIONED_HOST* and *LDAP_SCALED_OUT_HOST*, each running an Oracle Internet Directory instance.

When scaling up, use the existing Oracle Identity Management binaries on either node for creating the new Oracle Internet Directory instance.

To add a new Oracle Internet Directory instance to either Oracle Internet Directory node, or to scale out Oracle Internet Directory instances, perform the steps in the following subsections:

- Assemble Information for Scaling Oracle Internet Directory (page 17-4)
- Configure an Additional Oracle Internet Directory Instance (page 17-5)
- Register Oracle Internet Directory with the WebLogic Server Domain (IDMDomain) (page 17-8)
- Configure Oracle Internet Directory to Accept Server Authentication Mode SSL Connections (page 17-9)
- Reconfigure the Load Balancer (page 17-12).

17.2.4.1.1 Assemble Information for Scaling Oracle Internet Directory

Assemble the following information before scaling Oracle Internet Directory.

Description	Variable	Documented Value	Customer Value
Host Name		*LDAP_SCALED_OUT_HOST*.mycompany.com	
OID Port	*OID_LDAP_PORT*		This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **OID** row.
OID SSL Port	*OID_LDAP_SSL_PORT*		This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **OID SSL** row.
Oracle Instance Location	*OID_ORACLE_INSTANCE*		
Oracle Instance/ component Name	oid*n*	oid3	
OID Admin Password			
Password to protect the SSL wallet/ keystore	*COMMON_IDM_PASSWORD*		
Password for the CA wallet	*COMMON_IDM_PASSWORD*		
WebLogic Admin Host		ADMINVHN.mycompany.com	
WebLogic Admin Port	*WLS_ADMIN_PORT*	7001	
WebLogic Admin User		weblogic_idm	
WebLogic Admin Password			

17.2.4.1.2 Configure an Additional Oracle Internet Directory Instance

The schema database must be running before performing this task. Follow these steps to install Oracle Internet Directory on the host:

1. Before starting the configuration, determine the ports to be used for the new directory instance. For Scale out, these can be the same as the other existing instances. For Scale Up these ports must be unique to the new server instance.

   Ensure that selected ports are not in use by any service on the computer by issuing these commands for the operating system that is being used.

   For example, on Linux, enter:

   ```
   netstat -an | grep "3060"
   netstat -an | grep "3131"
   ```

If a port is not in use, no output is returned from the command. If the ports are in use (that is, if the command returns output identifying either port), they must be free.

Remove the entries for the ports in the `/etc/services` file and restart the services, as described in Start and Stop Components (page 10-26), or restart the computer.

2. Create a file containing the ports used by Oracle Internet Directory. On Disk1 of the installation media, locate the file `stage/Response/staticports.ini`. Copy it to a file called `oid_ports.ini`. Delete all entries in `oid_ports.ini` except for `Non-SSL Port for Oracle Internet Directory` and `SSL Port for Oracle Internet Directory`. Change the values of those ports to the ports to be used, for example: `3060` and `3131`.

   If the port names in the file are slightly different from those listed in this step, use the names in the file.

3. Start the Oracle Identity Management 11*g* Configuration Wizard by running *`OID_ORACLE_HOME`*`/bin/config.sh`.

4. On the Welcome screen, click **Next**.

5. On the Select Domain screen, select **Configure without a Domain**.

   Click **Next**.

6. On the Specify Installation Location screen, specify the following values:

   Oracle Instance Location: *`OID_ORACLE_INSTANCE`*

   Oracle Instance Name: `oid`*`n`*, where *n* is a sequential number for the instance. For example, if there are two instances already configured, *n* is3, so enter `oid3`.

   Click **Next**.

7. On the Specify Email for Security Updates screen, specify these values:

   - Email Address: Provide the email address for the My Oracle Support account.
   - Oracle Support Password: Provide the password for the My Oracle Support account.
   - Check the check box next to the **I wish to receive security updates via My Oracle Support** field.

   Click **Next**.

8. On the Configure Components screen, select Oracle Internet Directory, deselect all the other components, and click **Next**.

9. On the Configure Ports screen, use the `oid_ports.ini` file created in Step 2 to specify the ports to be used. This enables to bypass automatic port configuration.

   a. Select **Specify Ports using a Configuration File**.

   b. In the file name field specify `oid_ports.ini`.

   c. Click **Save**, then click **Next**.

10. On the Specify Schema Database screen, select **Use Existing Schema** and specify the following values:

    - Connect String: This value is available in the *Oracle Fusion Applications Installation Workbook*, **Database** tab, **IDM Database** table, **IDM DB Instances** row.

- The Oracle RAC database connect string information must be provided in the format:

  host1:*port1*:*instance1* ^*host2*:*port2*:*instance2*@*servicename*

- During this installation, it is not required that all the Oracle RAC instances to be up. If one Oracle RAC instance is up, the installation can proceed.
- Complete and accurate information must be provided. Specifically, the correct host, port, and instance name for each Oracle RAC instance must be provided, and the service name provided must be configured for all the specified Oracle RAC instances.

  Any incorrect information entered in the Oracle RAC database connect string must be corrected manually after the installation.

- User Name: `ODS`
- Password: *password*. This is the password of the ODS schema in the database as specified when Oracle Identity Management RCU was run.

Click **Next**.

11. The ODS Schema in use message appears. The ODS schema chosen is already being used by the existing Oracle Internet Directory instance. Therefore, the new Oracle Internet Directory instance being configured would reuse the same schema.

    Choose **Yes** to continue.

    A popup window with this message appears:

    ```
    "Please ensure that the system time on this Identity Management Node
    is in sync with the time on other Identity management Nodes that are
    part of the Oracle Application Server Cluster (Identity Management)
    configuration. Failure to ensure this may result in unwanted instance
    failovers, inconsistent operational attributes in directory entries
    and potential inconsistent behavior of password state policies."
    ```

    Ensure that the system time is synchronized among all the I*DM_PROVISIONED_HOST*s and *IDM_SCALED_OUT_HOST*s. See Synchronize Oracle Internet Directory Nodes (page 5-6).

    Click **OK** to continue.

12. On the Specify OID Admin Password screen, specify the Oracle Internet Directory administration password.

    If a message saying that OID is not running is displayed, verify that the orcladmin account has not become locked and try again. Do not continue until this message is no longer displayed.

    Click **Next**.

13. On the Installation Summary screen, review the selections to ensure that they are correct. If they are not, click **Back** to modify selections on previous screens. When they are correct, click **Configure**.

14. On the Configuration screen, multiple configuration assistants are launched in succession. This process can be lengthy. Wait for the configuration process to finish.

15. On the Installation Complete screen, click **Finish** to confirm the choice to exit.

16. To validate the installation of the Oracle Internet Directory instance on the new LDAP host, issue these commands:

```
ldapbind -h LDAPHOST.mycompany.com -p 3060 -D "cn=orcladmin" -q
ldapbind -h LDAPHOST.mycompany.com -p 3131-D "cn=orcladmin" -q -U 1
```

where *LDAPHOST* is the host where the new instance is running.

Ensure that the following environment variables are set before using `ldapbind`:

- *ORACLE_HOME*
- *ORACLE_INSTANCE*
- *PATH* - The following directory locations should be in the *PATH*:

  IDM_ORACLE_HOME/bin

  IDM_ORACLE_HOME/ldap/bin

  IDM_ORACLE_HOME/ldap/admin

17.2.4.1.3 Register Oracle Internet Directory with the WebLogic Server Domain (IDMDomain)

All the Oracle Fusion Middleware components deployed in this enterprise deployment are managed by using Oracle Enterprise Manager Fusion Middleware Control. To manage the Oracle Internet Directory component with this tool, register the component and the Oracle Fusion Middleware instance that contains it with an Oracle WebLogic Server domain. A component can be registered either at install time or post-install. A previously un-registered component can be registered with a WebLogic domain by using the `opmnctl registerinstance` command.

To register the Oracle Internet Directory instances installed on the host where the new server instance is running, follow these steps for each instance:

1. On the new host:

   Set `ORACLE_HOME` to *IDM_ORACLE_HOME*.

   Set `ORACLE_INSTANCE` to *OID_ORACLE_INSTANCE*, where *OID_ORACLE_INSTANCE* is the location of the newly created instance.

2. Execute the `opmnctl registerinstance` command:

   ```
   OID_ORACLE_INSTANCE/bin/opmnctl registerinstance -adminHost WLSHostName -
   adminPort WLSPort -adminUsername adminUserName
   ```

   For example:

   ```
   OID_ORACLE_INSTANCE/bin/opmnctl registerinstance -adminHost
   ADMINVHN.mycompany.com -adminPort 7001 -adminUsername weblogic
   ```

   The command requires login to WebLogic Administration Server (`ADMINVHN.mycompany.com`)

   Username: `weblogic`

   Password: `*******`

   For additional details on registering Oracle Internet Directory components with a WebLogic Server domain, see Registering an Oracle Instance or Component with

the WebLogic Server in the Oracle Fusion Middleware Administrator's Guide for Oracle Internet Directory.

3. On the host where the new instance is running, update the Enterprise Manager Repository URL using the `emctl` utility with the `switchOMS` flag. This will enable the local emagent to communicate with the WebLogic Administration Server using the virtual IP address. The `emctl` utility is located under the *`OID_ORACLE_INSTANCE`*`/EMAGENT/EMAGENT/bin` directory.

   Syntax:

   ```
   ./emctl switchOMS ReposURL
   ```

   For Example:

   ```
   ./emctl switchOMS http://ADMINVHN:7001/em/upload
   ```

   Output:

   ```
   ./emctl switchOMS http://ADMINVHN.mycompany.com:7001/em/upload
   Oracle Enterprise Manager 10g Release 5 Grid Control 10.2.0.5.0.
   Copyright (c) 1996, 2009 Oracle Corporation.  All rights reserved.
   SwitchOMS succeeded.
   ```

4. Force the agent to reload its configuration by issuing the command:

   ```
   ./emctl reload
   ```

5. Check that the agent is using the correct Upload URL using the command:

   ```
   ./emctl status agent
   ```

6. Validate that the agents on the host where the new server is running are configured properly to monitor their respective targets. Follow these steps to complete this task:

   - Use a web browser to access Oracle Enterprise Manager Fusion Middleware Control at:

     `http://ADMINVHN.mycompany.com:7001/em`

     Log in as the `weblogic_idm` user.

   - From the Domain Home Page navigate to the Agent-Monitored Targets page using the menu under **Farm**, **Agent-Monitored Targets**.

   - Update the WebLogic monitoring user name and the WebLogic monitoring password.

     – Enter `weblogic_idm` as the WebLogic monitoring user name and the password for the `weblogic_idm` user as the WebLogic monitoring password.

     – Click **OK** to save changes.

17.2.4.1.4 Configure Oracle Internet Directory to Accept Server Authentication Mode SSL Connections

If SSL Authentication Mode is used, the following must be performed to ensure that the Oracle Internet Directory instances are capable of accepting requests using this mode. Each Oracle Internet Directory instance must be configured independently.

To enable Oracle Internet Directory to communicate using SSL Server Authentication Mode, perform the following steps on the host where the new server is running:

When this operation is performed, only the Oracle Internet Directory instance used should be running.

1. Set the *ORACLE_HOME*, *ORACLE_INSTANCE* and *JAVA_HOME* variables. For example:
   - Set ORACLE_HOME to *IDM_ORACLE_HOME*.
   - Set ORACLE_INSTANCE to *OID_ORACLE_INSTANCE*.
   - Set JAVA_HOME to *DIR_MW_HOME*/jdk
   - Set the PATH variable to include *JAVA_HOME*.
2. To enable SSL Server Authentication use the tool SSLServerConfig which is located in:

   ORACLE_COMMON_HOME/bin

   For example

   ```
   $ORACLE_COMMON_HOME/bin/SSLServerConfig.sh -component oid
   ```
3. When prompted, enter the following information:
   - LDAP Hostname: Central LDAP host, for example: POLICYSTORE.mycompany.com
   - LDAP port: *LDAP_POLICY_LBR_PORT*, for example: 389
   - Admin user DN: cn=orcladmin
   - Password: *orcladmin_password*
   - sslDomain for the CA: IDMDomain Oracle recommends that the SSLDomain name be the same as the Weblogic domain name to make reference easier.
   - Password to protect the SSL wallet/keystore: *COMMON_IDM_PASSWORD*
   - Enter confirmed password for the SSL wallet/keystore: *COMMON_IDM_PASSWORD*
   - Password for the CA wallet: *certificate_password*. This is the primary password used when provisioning was run.
   - Country Name 2 letter code: Two letter country code, such as US
   - State or Province Name: State or province, for example: California
   - Locality Name: Enter the name of the city, for example: RedwoodCity
   - Organization Name: Company name, for example: mycompany
   - Organizational Unit Name: Leave at the default
   - Common Name: Name of this host, for example: LDAP_SCALED_OUT_HOST.mycompany.com
   - OID component name: Name of the Oracle Instance, for example: oid1. To determine the OID component name, execute the command:

     OID_ORACLE_INSTANCE/bin/opmnctl status
   - WebLogic admin host: Host running the WebLogic Administration Server, for example:. ADMINVHN.mycompany.com
   - WebLogic admin port: *WLS_ADMIN_PORT*, for example: 7001

- WebLogic admin user: Name of the WebLogic administration user, for example: `weblogic`
- WebLogic password: *`password`*.
- AS instance name: Name of the new instance entered in Step 6 of Configure an Additional Oracle Internet Directory Instance (page 17-5), for example: `oid3`.
- SSL wallet name for OID component [oid_wallet1]: Accept the default
- Do you want to restart your OID component: `Yes`
- Do you want to test your SSL setup? `Yes`
- SSL Port of the OID Server: *`OID_LDAP_SSL_PORT`*, for example: `3131`

Sample output:

```
Server SSL Automation Script: Release 11.1.1.4.0 - Production
Copyright (c) 2010 Oracle. All rights reserved.

Downloading the CA wallet from the central LDAP location...
>>>Enter the LDAP Hostname [SLC00DRA.mycompany.com]: POLICYSTORE.mycompany.com
>>>Enter the LDAP port [3060]: 3060
>>>Enter an admin user DN [cn=orcladmin]
>>>Enter password for cn=orcladmin:
>>>Enter the sslDomain for the CA [idm]: IDMDomain
>>>Enter a password to protect your SSL wallet/keystore:
>>>Enter confirmed password for your SSL wallet/keystore:
>>>Enter password for the CA wallet:
>>>Searching the LDAP for the CA usercertificate ...
Importing the CA certifcate into trust stores...
>>>Searching the LDAP for the CA userpkcs12 ...

Invoking OID SSL Server Configuration Script...
Enter attribute values for your certificate DN
>>>Country Name 2 letter code [US]:
>>>State or Province Name [California]:
>>>Locality Name(eg, city) []:Redwood
>>>Organization Name (eg, company) [mycompany]:
>>>Organizational Unit Name (eg, section) [oid-20110524015634]:
>>>Common Name (eg, hostName.domainName.com) [SLC00XXX.mycompany.com]:
The subject DN is
cn=SLC00DRA.mycompany.com,ou=oid-20110524015634,l=Redwood,st=California,c=US

Creating an Oracle SSL Wallet for oid instance...
/u01/oracle/products/access/idm/../oracle_common/bin
>>>Enter your OID component name: [oid1]
>>>Enter the weblogic admin server host [SLC00XXX.mycompany.com] ADMINVHN
>>>Enter the weblogic admin port: [7001]
>>>Enter the weblogic admin user: [weblogic]
>>>Enter weblogic password:
>>>Enter your AS instance name:[asinst_1] oid1
>>>Enter an SSL wallet name for OID component [oid_wallet1]
Checking the existence of oid_wallet1 in the OID server...
Configuring the newly generated Oracle Wallet with your OID component...
Do you want to restart your OID component?[y/n]y

Do you want to test your SSL set up?[y/n]y
>>>Please enter your OID ssl port:[3131] 3131
Please enter the OID hostname:[SLC00DRA.mycompany.com]
LDAP_SCALED_OUT_HOST.mycompany.com
```

```
>>>Invoking IDM_ORACLE_HOM/bin/ldapbind -h LDAP_SCALED_OUT_HOST.mycompany.com -p
3131-U 2 -D cn=orcladmin ...
Bind successful

Your oid1 SSL server has been set up successfully
```

Confirm that the script has been successful. Repeat all the steps in Configuring Oracle Internet Directory to Accept Server Authentication Mode SSL Connections (page 17-9). for each Oracle Internet Directory instance.

17.2.4.1.5 Reconfigure the Load Balancer

If the Oracle Internet Directory instances are accessed through a load balancer, add the new Oracle Internet Directory instance to the existing server pool defined on the load balancer for distributing requests across the Oracle Internet Directory instances.

17.2.4.2 Scale Oracle Virtual Directory

The Directory Tier has two nodes, *LDAP_PROVISIONED_HOST* and *LDAP_SCALED_OUT_HOST*, each running an Oracle Virtual Directory instance.

When scaling up, use existing Oracle Identity Management binaries on either node for creating the new Oracle Virtual Directory instance.

To add a new Oracle Virtual Directory instance to either Oracle Virtual Directory node, or to scale out Oracle Virtual Directory instances, perform the steps in the following subsections:

- Assemble Information for Scaling Oracle Virtual Directory (page 17-12)
- Configure an Additional Oracle Virtual Directory (page 17-13)
- Register Oracle Virtual Directory with the Oracle WebLogic Server Domain (IDMDomain) (page 17-15)
- Configure Oracle Virtual Directory for SSL (page 17-17)
- Create ODSM Connections to Oracle Virtual Directory (page 17-18)
- Create Adapters in Oracle Virtual Directory (page 17-18)
- Reconfigure the Load Balancer (page 17-21)

17.2.4.2.1 Assemble Information for Scaling Oracle Virtual Directory

Assemble the following information before scaling Oracle Virtual Directory.

Description	Variable	Documented Value	Customer Value
Host Name	NA	`LDAP_SCALED_OUT_HOST.mycompany.com`	NA
OVD Listen Port	*OVD_PORT*	NA	This value is available in the *Oracle Fusion Applications Installation Workbook*, Network - Ports tab, Identity Management Port Numbers table, OVD.
OVD SSL Port	*OVD_SSL_PORT*	NA	This value is available in the *Oracle Fusion Applications Installation Workbook*, Network - Ports tab, Identity Management Port Numbers table, OVD SSL.

Description	Variable	Documented Value	Customer Value
Oracle Virtual Directory Proxy Port	*OVD_ADMIN_PORT*	NA	This value is available in the *Oracle Fusion Applications Installation Workbook* Network - Ports tab, Identity Management Port Numbers table, OVD Admin.
Oracle Instance Location	*OVD_ORACLE_INSTANCE*	/u02/local/oracle/config/instances/oid*n*	NA
OVD Existing Instance/ Component Name	ovd*n*	ovd1	NA
Newly Created Instance/ Component Name	ovd*n*	ovd3	NA
OVD Administrator Password	NA	NA	NA
WebLogic Admin Host	*WLSHostName*	ADMINVHN.mycompany.com	NA
WebLogic Admin Port	*WLS_PORT*	7001	NA
WebLogic Admin User	*adminUserName*	weblogic_idm	NA
WebLogicAdmin Password	NA	NA	NA
Back end Identity Store host	*OID_LBR_HOST*	OIDIDSTORE.mycompany.com	NA
Back end Identity Store port	*OID_LDAP_PORT*	NA	This value is available in the *Oracle Fusion Applications Installation Workbook* Network - Ports tab ->Identity Management Port Numbers -> OID.
Identity Store LDAP admin password	NA	NA	NA
Password to protect your SSL wallet/keystore	*COMMON_IDM_PASSWORD*	NA	NA
Password for the CA wallet (created when you ran the Oracle Identity Management Provisioning Wizard)	*COMMON_IDM_PASSWORD*	NA	NA

17.2.4.2.2 Configure an Additional Oracle Virtual Directory

Follow these steps to configure the new Oracle Virtual Directory instance:

1. Ensure that ports used (*OVD_PORT* and *OVD_SSL_PORT*) are not in use by any service on the computer by issuing these commands for the operating system that is used.

   On Linux:

   ```
   netstat -an | grep "6501"
   netstat -an | grep "7501"
   ```

   If a port is not in use, no output is returned from the command. If the ports are in use (that is, if the command returns output identifying either port), the port must be free.

   On Linux:

Remove the entries for ports used by Oracle Virtual Directory in the `/etc/services` file and restart the services, as described in Start and Stop Components (page 10-26), or restart the computer.

2. Create a file containing the ports used by Oracle Virtual Directory. On Disk1 of the installation media, locate the file stage/`Response/staticports.ini`. Copy it to a file called `ovd_ports.ini`. Delete all entries in ovd_ports.ini except for Non-SSL Port for Oracle Virtual Directory and SSL Port for Oracle Virtual Directory. Change the values of those ports to the ports to be used, example: 3060 and 3131.

   If the port names in the file are slightly different from those listed in this step, use the names in the file.

3. Start the Oracle Identity Management 11*g* Configuration Wizard by running *`OID_ORACLE_HOME`*`/bin/config.sh`.

4. On the Welcome screen, click **Next**.

5. On the Select Domain screen, select **Configure without a Domain**.

   Click **Next**.

6. On the Specify Installation Location screen, specify the following values:

   Oracle Instance Location: *`OVD_ORACLE_INSTANCE`*

   Oracle Instance Name: `ovd`*`n`*, where *n* is a sequential number for the instance. For example, if there are two instances already configured, *n* will be 3, so enter `ovd3`.

   Click **Next**.

7. On the Specify Email for Security Updates screen, specify these values:

   - **Email Address**: Provide the email address for the My Oracle Support account.
   - **Oracle Support Password**: Provide the password for the My Oracle Support account.
   - Check the checkbox next to the **I wish to receive security updates via My Oracle Support** field.

   Click **Next**.

8. On the Configure Components screen, select Oracle Virtual Directory, deselect all the other components, and click **Next**.

9. On the Configure Ports screen, use the ovd_ports.ini file created in Step 2 to specify the ports to be used. This enables to bypass automatic port configuration.

   a. Select **Specify Ports using a Configuration File**.

   b. In the file name field specify `ovd_ports.ini`.

   c. Click **Save**, then click **Next**.

10. On the Specify Virtual Directory screen: In the Client Listeners section, enter:

    - LDAP v3 Name Space: *`REALM_DN`*, for example: `dc=mycompany,dc=com`

    In the OVD Administrator section, enter:

    - Administrator User Name: `cn=orcladmin`
    - Password: *`administrator_password`*
    - Confirm Password: *`administrator_password`*

Select **Configure the Administrative Server in secure mode**.

Click **Next**.

11. On the Installation Summary screen, review the selections to ensure that they are correct. If they are not, click **Back** to modify selections on previous screens. When they are correct, click **Configure**.
12. On the Configuration screen, multiple configuration assistants are launched in succession. This process can be lengthy. Wait for the configuration process to finish.

    Click **Next**.
13. On the Installation Complete screen, click **Finish** to confirm the choice to exit.
14. To validate the installation of the Oracle Virtual Directory instance on the host, issue these commands:

    ```
    ldapbind -h LDAPHOST.mycompany.com -p 6501 -D "cn=orcladmin" -q
    ldapbind -h LDAPHOST.mycompany.com -p 7501 -D "cn=orcladmin" -q -U 1
    ```

    where *LDAPHOST* is the host where the new instance is running.

    Ensure that the following environment variables are set before using `ldapbind`:

    - Set *ORACLE_HOME* to *OID_ORACLE_HOME*.
    - Set *ORACLE_INSTANCE* to *OVD_ORACLE_INSTANCE*.
    - *PATH* - The following directory locations should be in the*PATH*:

      OID_ORACLE_HOME/bin

      OID_ORACLE_HOME/ldap/bin

      OID_ORACLE_HOME/ldap/admin

17.2.4.2.3 Register Oracle Virtual Directory with the Oracle WebLogic Server Domain (IDMDomain)

All the Oracle Fusion Middleware components deployed in this enterprise deployment are managed by using Oracle Enterprise Manager Fusion Middleware Control. To manage the Oracle Virtual Directory component with this tool, register the component and the Oracle Fusion Middleware instance that contains it with an Oracle WebLogic Server domain. A component can be registered either at install time or post-install. A previously un-registered component can be registered with a WebLogic domain by using the `opmnctl registerinstance` command.

To register the Oracle Virtual Directory instances, follow these steps on the host where the new instance is running:

1. Set the *ORACLE_HOME* to *OID_ORACLE_HOME*.
2. Set *ORACLE_INSTANCE* to *OVD_ORACLE_INSTANCE1*, where *OVD_ORACLE_INSTANCE1* is the location of the newly-created instance.
3. Execute the `opmnctl registerinstance` command:

   ```
   OVD_ORACLE_INSTANCE/bin/opmnctl registerinstance -adminHost WLSHostName  -
   adminPort WLSPort -adminUsername adminUserName
   ```

   For example:

```
OVD_ORACLE_INSTANCE/bin/opmnctl registerinstance \
   -adminHost ADMINVHN.mycompany.com -adminPort 7001 -adminUsername weblogic
```

The command requires login to WebLogic Administration Server.

Username: `weblogic`

Password: *`password`*

For additional details on registering Oracle Virtual Directory components with a WebLogic Server domain, see Registering an Oracle Instance Using OPMNCTL in the Oracle Fusion Middleware Administrator's Guide for Oracle Virtual Directory.

4. In order to manage Oracle Virtual Directory by using Oracle Enterprise Manager Fusion Middleware Control, the Enterprise Manager Repository URL must be updated to point to the virtual IP address associated with the WebLogic Administration Server. Do this using the `emctl` utility with the `switchOMS` flag. This will enable the local emagent to communicate with the WebLogic Administration Server using the virtual IP address. The `emctl` utility is located under the *`OVD_ORACLE_INSTANCE`*`/EMAGENT/EMAGENT/bin` directory.

   Syntax:

   ```
   ./emctl switchOMS ReposURL
   ```

   For Example:

   ```
   ./emctl switchOMS http://ADMINVHN:7001/em/upload
   ```

   Output:

   ```
   ./emctl switchOMS http://ADMINVHN.mycompany.com:7001/em/upload
   Oracle Enterprise Manager 10g Release 5 Grid Control 10.2.0.5.0.
   Copyright (c) 1996, 2009 Oracle Corporation.  All rights reserved.
   SwitchOMS succeeded.
   ```

5. Force the agent to reload its configuration by issuing the command:

   ```
   ./emctl reload
   ```

6. Check that the agent is using the correct Upload URL using the command:

   ```
   ./emctl status agent
   ```

7. Validate if the agents on the host where the new instance is running are configured properly to monitor their respective targets. Follow these steps to complete this task:

   a. Use a web browser to access Oracle Enterprise Manager Fusion Middleware Control at `http://ADMINVHN.mycompany.com:7001/em`. Log in as the `weblogic_idm` user.

   b. From the Domain Home Page navigate to the Agent-Monitored Targets page using the menu under **Farm**, then**Agent-Monitored Targets**

   c. Update the WebLogic monitoring user name and the WebLogic monitoring password.

      - Enter `weblogic_idm` as the WebLogic monitoring user name and the password for the weblogic user as the WebLogic monitoring password.
      - Click **OK** to save changes.

17.2.4.2.3.1 Configure Oracle Virtual Directory for SSL

Before configuring Oracle Virtual Directory for SSL, set the *ORACLE_HOME*, *ORACLE_INSTANCE* and *JAVA_HOME* variables. For example, on the new *LDAPHOST*, set ORACLE_HOME to *OID_ORACLE_HOME*, set ORACLE_INSTANCE to *OVD_ORACLE_INSTANCE*, set JAVA_HOME to *JAVA_HOME*, and add *JAVA_HOME* to the *PATH* variable.

Start the SSL Configuration Tool by issuing the command SSLServerConfig command which is located in the directory *ORACLE_COMMON_HOME*/bin directory.

For example:

```
ORACLE_COMMON_HOME/bin/SSLServerConfig.sh -component ovd
```

When prompted, enter the following information:

- LDAP Hostname: Central LDAP host, for example: POLICYSTORE.mycompany.com

  It is recommended to use the Policy Store directory, not the Identity Store.
- LDAP port: LDAP port, for example: 3060 (*OID_LDAP_PORT*)
- Admin user DN: cn=orcladmin
- Password: *administrator_password*
- sslDomain for the CA: IDMDomain
- Password to protect the SSL wallet/keystore: *password_for_local_keystore*
- Enter confirmed password for the SSL wallet/keystore: *password_for_local_keystore*
- Password for the CA wallet: certificate_password. This is the primary password crated when provisioning. Fixed was run as in OID Section
- Country Name 2 letter code: Two letter country code, such as US
- State or Province Name: State or province, for example: California
- Locality Name: Enter the name of the city, for example: RedwoodCity
- Organization Name: Company name, for example: mycompany
- Organizational Unit Name: Leave at the default
- Common Name: Name of this host, for example: LDAP_SCALED_OUT_HOST.mycompany.com
- OVD Instance Name: for example, ovd1. To determine the OVD component name, execute the command:

  ```
  OVD_ORACLE_INSTANCE/bin/opmnctl status
  ```
- Oracle instance name: Name of the newly created Oracle instance, for example: ovd3Fixed as in OID Section
- WebLogic admin host: Host running the WebLogic Administration Server, for example:. ADMINVHN.mycompany.com
- WebLogic admin port: WebLogic Administration Server port, for example: 7001 (*WLS_ADMIN_PORT*)
- WebLogic admin user: Name of the WebLogic administration user, for example: weblogic

- WebLogic password: *password*.
- SSL wallet name for OVD component [ovdks1.jks]: Accept the default

When asked to restart the Oracle Virtual Directory component, enter Yes.

When asked to test the OVD SSL connection, enter Yes. Ensure that the test is a success.

17.2.4.2.4 Create ODSM Connections to Oracle Virtual Directory

Before managing Oracle Virtual Directory, create connections from ODSM to each of the Oracle Virtual Directory instances. To do this, proceed as follows:

1. Access ODSM through the load balancer at: http://ADMIN.mycompany.com/odsm
2. Follow these steps to create connections to Oracle Virtual Directory:

   To create connections to Oracle Virtual Directory, follow these steps. Create connections to each Oracle Virtual Directory node separately. Using the Oracle Virtual Directory load balancer virtual host from ODSM is not supported:

   a. Create a direct connection to Oracle Virtual Directory on the new host providing the following information in ODSM:

      Host: *LDAPHOST*.mycompany.com

      Port: 8899 (The Oracle Virtual Directory proxy port, *OVD_ADMIN_PORT*)

      Enable the SSL option.

      User: cn=orcladmin

      Password: password_to_connect_to_OVD

   b. Create a direct connection to Oracle Virtual Directory on the host where the new instance is running, providing the following information in ODSM:

      Host: *LDAPHOST*.mycompany.com

      Port: 8899 (The Oracle Virtual Directory proxy port)

      Enable the SSL option.

      User: cn=orcladmin

      Password: password_to_connect_to_OVD

17.2.4.2.5 Create Adapters in Oracle Virtual Directory

Oracle Virtual Directory communicates with other directories through adapters.

The procedure is slightly different, depending on the directory connected to. The following sections show how to create and validate adapters for supported directories:

Creating Oracle Virtual Directory Adapters for Oracle Internet Directory and Active Directory

idmConfigTool can be used to create the Oracle Virtual Directory User and Changelog adapters for Oracle Internet Directory and Active Directory. Oracle Identity Manager requires adapters. It is highly recommended, though not mandatory, to use Oracle Virtual Directory to connect to Oracle Internet Directory.

To do this, perform the following tasks on *IDM_PROVISIONED_HOST*:

1. Set the environment variable *ORACLE_HOME* to *IAM_ORACLE_HOME*.
2. Create a properties file for the adapter that is configured called `ovd1.props`. The contents of this file depends on whether the Oracle Internet Directory adapter or the Active Directory Adapter are being configured.

   - **Oracle Internet Directory** adapter properties file:

     ```
     ovd.host:LDAPHOST.mycompany.com
     ovd.port:8899
     ovd.binddn:cn=orcladmin
     ovd.password:ovdpassword
     ovd.oamenabled:true
     ovd.ssl:true
     ldap1.type:OID
     ldap1.host:OIDIDSTORE.mycompany.com
     ldap1.port:3060
     ldap1.binddn:cn=oimLDAP,cn=systemids,dc=mycompany,dc=com
     ldap1.password:oidpassword
     ldap1.ssl:false
     ldap1.base:dc=mycompany,dc=com
     ldap1.ovd.base:dc=mycompany,dc=com
     usecase.type: single
     ```

   - **Active Directory** adapter properties file:

     ```
     ovd.host:LDAPHOST.mycompany.com
     ovd.port:8899
     ovd.binddn:cn=orcladmin
     ovd.password:ovdpassword
     ovd.oamenabled:true
     ovd.ssl:true
     ldap1.type:AD
     ldap1.host:ADIDSTORE.mycompany.com
     ldap1.port:636
     ldap1.binddn:cn=adminuser
     ldap1.password:adpassword
     ldap1.ssl:true
     ldap1.base:dc=mycompany,dc=com
     ldap1.ovd.base:dc=mycompany,dc=com
     usecase.type: single
     ```

   The following list describes the parameters used in the properties file.

   - `ovd.host` is the host name of a server running Oracle Virtual Directory.
   - `ovd.port` is the https port used to access Oracle Virtual Directory (*OVD_ADMIN_PORT*).
   - `ovd.binddn` is the user DN used to connect to Oracle Virtual Directory.
   - `ovd.password` is the password for the DN used to connect to Oracle Virtual Directory.
   - `ovd.oamenabled` is always `true` in Oracle Fusion Applications deployments.
   - `ovd.ssl` is set to `true`, as an https port is being run.
   - `ldap1.type` is set to OID for the Oracle Internet Directory back end directory or set to AD for the Active Directory back end directory.
   - `ldap1.host` is the host on which back end directory is located. Use the load balancer name.

- `ldap1.port` is the port used to communicate with the back end directory (*`OID_LDAP_PORT`* or *`OID_LDAP_SSL_PORT`*.
- `ldap1.binddn` is the bind DN of the `oimLDAP` user.
- `ldap1.password` is the password of the `oimLDAP` user
- `ldap1.ssl` is set to `true` if the back end's SSL connection is used, and otherwise set to `false`. This should always be set to `true` when an adapter is being created for AD.
- `ldap1.base` is the base location in the directory tree.
- `ldap1.ovd.base` is the mapped location in Oracle Virtual Directory.
- `usecase.type` is set to `Single` when using a single directory type.

3. Configure the adapter by using the `idmConfigTool` command, which is located at:

   `IAM_ORACLE_HOME``/idmtools/bin`

   When the `idmConfigTool` is run, it creates or appends to the file `idmDomainConfig.param`. This file is generated in the same directory that the `idmConfigTool` is run from. To ensure that each time the tool is run, the same file is appended to, always run the `idmConfigTool` from the directory:

   `IAM_ORACLE_HOME``/idmtools/bin`

   The syntax of the command is:

   ```
   idmConfigTool.sh -configOVD input_file=configfile [log_file=logfile]
   ```

   For example:

   ```
   idmConfigTool.sh -configOVD input_file=ovd1.props
   ```

   The command requires no input. The output looks like this:

   ```
   The tool has completed its operation. Details have been logged to logfile
   ```

Run this command for the newly created Oracle Virtual Directory instance in the topology, with the appropriate value for `ovd.host` in the property file.

Validating the Oracle Virtual Directory Adapters

Perform the following tasks by using ODSM:

1. Access ODSM through the load balancer at: `http://ADMIN.mycompany.com/odsm`
2. Connect to Oracle Virtual Directory.
3. Go the **Data Browser** tab.
4. Expand **Client View** to see each of the user adapter root DN's listed.
5. Expand the user adapter root DN, if there are objects already in the back end LDAP server, those objects should be displayed here.
6. ODSM doesn't support changelog query, so the `cn=changelog` subtree cannot be expanded.

   Perform the following tasks by using the command-line:

   - Validate the user adapters by typing:

     ```
     ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q  -b
     user_search_base -s sub "objectclass=inetorgperson" dn
     ```

For example:

```
ldapsearch -h LDAPHOST.mycompany.com -p 6501 -D "cn=orcladmin" -q -b
"cn=Users,dc=mycompany,dc=com" -s sub "objectclass=inetorgperson" dn
```

Supply the password when prompted.

The user entries that already exist in the back end LDAP server should be seen.

- Validate changelog adapters by typing:

```
ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q  -b
"cn=changelog" -s one "changenumber>=0"
```

For example:

```
ldapsearch -h LDAPHOST -p 6501 -D "cn=orcladmin" -q -b "cn=changelog" -s
one "changenumber>=0"
```

The command returns logs of data, such as creation of all the users. It returns without error if the changelog adapters are valid.

- Validate `lastchangenumber` query by typing:

```
ldapsearch -h directory_host -p ldap_port -D "cn=orcladmin" -q -b
"cn=changelog" -s base 'objectclass=*' lastchangenumber
```

For example:

```
ldapsearch -h LDAP_SCALED_OUT_HOST -p 6501 -D "cn=orcladmin" -q -b
"cn=changelog" -s base 'objectclass=*' lastchangenumber
```

The command returns the latest change number generated in the back end LDAP server.

17.2.4.2.5.1 Reconfigure the Load Balancer

If the Oracle Virtual Directory instances are accessed through a load balancer, add the new Oracle Virtual Directory instance to the existing server pool defined on the load balancer for distributing requests across the Oracle Virtual Directory instances.

17.2.5 Scale the Application Tier

The Application Tier can be scaled out to multiple nodes. The following sections describe the details for scaling the Application Tier.

17.2.5.1 Mount Middleware Home and Create a New Machine when Scaling Out

When scaling out a component of the Application Tier, perform these steps first:

1. On the new node, mount the existing Middleware home, which should include the Oracle Fusion Middleware 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 *IAM_HOME* in shared storage to the local Oracle Inventory, execute the following command:

```
cd IAM_ORACLE_HOME/oui/bin
./attachHome.sh -jreLoc JAVA_HOME
```

3. To update the Middleware home list, create (or edit, if another WebLogic installation exists in the node) the *IAM_MW_HOME*/bea/beahomelist file and add *IAM_MW_HOME*/oui/bin to it.
4. Log in to the WebLogic Administration Console at: http://ADMIN.mycompany.com/console
5. Create a new machine for the new node to be used, and add the machine to the domain, as follows.
   a. Select **Environment**, then select **Machines** from the Navigation menu.
   b. Click **Lock and Edit**.
   c. Click **New** on the Machine Summary screen.
   d. Enter the following information:

      Name: Name of the machine. This is usually the host name.

      Machine OS: Select UNIX.
   e. Click **Next**.
   f. On the Node Manager Properties page, enter the following information:

      Type: SSL.

      Listen Address: Use the host name.
   g. Click **Finish**.
   h. Click **Activate Changes**.

17.2.5.2 Create a New Node Manager when Scaling Out

Node Manager is used to start and stop WebLogic managed servers on the new host. In order to create a new node manager for the new host perform the following steps:

1. Create a new directory for the new node manager by copying an existing one. Copy the directory *SHARED_CONFIG_DIR*/nodemanager/*IDM_PROVISIONED_HOST*.mycompany.com to: *SHARED_CONFIG_DIR*/nodemanager/*newidmhost*.mycompany.com

   For example:

   ```
   cp -r $SHARED_CONFIG_DIR/nodemanager/IDM_PROVISIONED_HOST.mycompany.com
   $SHARED_CONFIG_DIR/nodemanager/newidmhost.mycompany.com
   ```
2. Change to the newly created directory.

   ```
   cd SHARED_CONFIG_DIR/nodemanager/newidmhost.mycompany.com
   ```
3. Edit the nodemanager.properties file, changing all the entries for *IDM_PROVISIONED_HOST* to *newidmhost*. For example:

   ```
   DomainsFile=/u01/oracle//config/nodemanager/
   IDM_PROVISIONED_HOST.mycompany.com/nodemanager.domain
   ```

   becomes

   ```
   DomainsFile=/u01/oracle//config/nodemanager/newidmhost.mycompany.com/
   nodemanager.domain
   ```

4. Edit the `startNodeManagerWrapper.sh` file, changing all the entries for *`IDM_PROVISIONED_HOST`* to *`IDM_SCALED_OUT_HOST`*. For example:

   `NM_HOME=/u01/oracle/config/nodemanager/`*`IDM_PROVISIONED_HOST`*`.mycompany.com`

   becomes

   `NM_HOME=/u01/oracle/config/nodemanager/`*`IDM_SCALED_OUT_HOST`*`.mycompany.com`

5. Start the node manager by invoking the command:

   `./startNodeManagerWrapper.sh`

17.2.5.3 Scale ODSM

To scale up ODSM, use the existing installations (WebLogic Server home, Oracle Fusion Middleware home, and domain directories) for creating a new Managed Server for the Oracle Directory Services Manager component.

To scale out, use the existing installations in shared storage for creating the new Managed Servers. It is not necessary to install WebLogic Server or Identity Management binaries in a new location but it is necessary to run `pack` and `unpack` to move files to *`MSERVER`* on the new node. This is described in Complete the Oracle Identity Manager Configuration Steps (page 17-35).

To scale ODSM instances, follow these steps:

1. Assemble the following information for scaling ODSM.

Description	Variable	Documented Value	Customer Value
Host name		*`IDM_SCALED_OUT_HOST`*`.mycompany.com`	
ODSM Port	*`ODSM_PORT`*		This value is available in the *Oracle Fusion Applications Installation Workbook* **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain ODSM** row.
Oracle Instance Location/Name	*`ODS_ORACLE_INSTANCE`*	*`LOCAL_CONFIG_DIR`*`/instances/odsm`	
Oracle Middleware Home Location	*`IAM_MW_HOME`*	`/u01/oracle/products/app`	
Oracle Home Directory		`idm`	
WebLogic Admin host		`ADMINVHN.mycompany.com`	
WebLogic Admin Port	*`WLS_ADMIN_PORT`*	7001	
WebLogic User Name		weblogic_idm	
WebLogic Password	*`COMMON_IDM_PASSWORD`*		

Description	Variable	Documented Value	Customer Value
WebLogic Server Directory		*IAM_MW_HOME* / wlserver_10.3	

2. Ensure that the system, patch, kernel and other requirements are met. See Verifying Certification, System Requirements, and Interoperability in the *Oracle Fusion Middleware Installation Guide for Oracle Identity Management* in the Oracle Fusion Middleware documentation library for a specific platform and version.
3. To provisioning the Instance Home or the Managed Server domain directory on shared storage, ensure that the appropriate shared storage volumes are mounted on the new host as described in Mounting Middleware Home and Creating a New Machine when Scaling Out (page 17-21).
4. For scaling out, use the default port (*ODSM_PORT*). For scaling up, choose a unique port for this instance. Ensure that port number used is not in use by any service on the computer by issuing this command for the operating system used. If a port is not in use, no output is returned from the command.

   On Linux:

   ```
   netstat -an | grep "7005"
   ```

   If the port is in use (if the command returns output identifying the port), free it.

   On Linux:

   Remove the entries for port 7005 (*ODSM_PORT*) in the /etc/services file if the port is in use by a service and restart the services, as described in Start and Stop Components (page 10-26), or restart the computer.
5. Start the Oracle Identity Management 11g Configuration Wizard by running the config.sh script located under the *IDM_ORACLE_HOME*/bin directory on the new host. For example: *IDM_ORACLE_HOME*/bin
6. On the Welcome screen, click **Next**.
7. On the Select Domain screen, select the **Expand Cluster** option and specify these values:
   - **Hostname:** ADMINVHN.mycompany.com
   - **Port**: 7001 (*WLS_ADMIN_PORT*)
   - **UserName**: weblogic_idm
   - **User Password**: *password for the webLogic user*

   Click **Next**.
8. A dialog box with the following message appears:

   ```
   The selected domain is not a valid Identity Management domain or the
   installer
   cannot determine if it is a valid domain. If you created the domain using the
   Identity Management installer, you can ignore this message and continue. If
   you
   did not create the domain using the Identity Management installer, refer to
   the
   Identity Management documentation for information on how to verify the domain
   is valid.
   ```

Click **YES** to continue.

This is a benign warning that can be safely ignored.

9. A dialog box with the following message appears:

```
The selected domain is not a valid Identity Management domain or the
installer
cannot determine if it is a valid domain. If you created the domain using the
Identity Management installer, you can ignore this message and continue. If
you
did not create the domain using the Identity Management installer, refer to
the
Identity Management documentation for information on how to verify the domain
is valid.
```

Click **YES** to continue.

This is a benign warning that can be safely ignored.

10. On the Email for Security Updates screen, specify these values:
    - **Email Address**: Provide the email address for the My Oracle Support account.
    - **Oracle Support Password**: Provide the password for the My Oracle Support account.
    - Select the checkbox next to the **I wish to receive security updates via My Oracle Support** field.

    Click **Next**.
11. On the Configure Components screen, de-select all the products except ODSM and then click **Next**.
12. On the Configure Ports screen, use the `odsm_ports.ini` file created in Step 4 to specify the ports to be used. This enables to bypass automatic port configuration.
    a. Select **Specify Ports using a Configuration File**.
    b. In the file name field specify `odsm_ports.ini`.
    c. Click **Save**, then click **Next**.
13. On the Installation Summary screen, review the selections to ensure that they are correct (if they are not, click **Back** to modify selections on previous screens), and click **Configure**.
14. On the Configuration Progress screen, multiple configuration assistants are launched in succession; this process can be lengthy. Wait until it completes.
15. On the Installation Complete screen, click **Finish** to confirm the choice to exit.
16. Add the newly added Managed Server host name and port to the list WebLogicCluster parameter, as described in Add New WebLogic Managed Server to Oracle HTTP Server Configuration Files (page 17-40).

17.2.5.4 Scale Oracle Access Manager 11g

To scale up, use the existing installations (WebLogic Server home, Oracle Fusion Middleware home, and domain directories) for creating a new Managed Server for the Oracle Access Manager component.

Use the existing binaries in shared storage for creating the new Managed Servers. It is not necessary to install WebLogic Server or Identity Management binaries in a new location but it is necessary to run pack and unpack to bootstrap the domain configuration in the new node.

If shared storage is used, allow the new host access to that shared storage area.

Scale Oracle Access Manager by performing the steps in the following subsections:

17.2.5.4.1 Assemble Information for Scaling Oracle Access Manager

Assemble the following information before scaling Oracle Access Manager.

Description	Variable	Documented Value	Customer Value
Host Name	`IDMHOST`*`n`*	NA	NA
Existing OAM server	NA	`WLS_OAM1`	NA
New OAM server name	`WLS_OAM`*`n`*	`WLS_OAM3`	NA
Server Listen Address	NA	NA	NA
Server Listen Port	*`OAM_PORT`*	NA	This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain OAM** row.
WebLogic Admin Host	NA	ADMINVHN.mycompany.com	NA
WebLogic Admin Port	*`WLS_ADMIN_PORT`*	7001	NA
WebLogic Admin User	NA	weblogic_idm	NA
WebLogic Admin Password	NA	NA	NA

17.2.5.4.2 Prepare New Node for Scaling Out

The following steps are necessary only in case of scaling out.

1. Ensure that shared storage is mounted on the new node, as described in Mount Middleware Home and Create a New Machine when Scaling Out (page 17-21).
2. To update the Middleware home list, create (or edit, if another WebLogic installation exists in the node) the *`IAM_MW_HOME`*`/bea/beahomelist` file and add *`IAM_MW_HOME`* to it.

17.2.5.4.3 Configure the New Oracle Access Manager Server

1. Log in to the Oracle WebLogic Administration Console at: `http://ADMIN.mycompany.com/console`

2. 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.
3. Click **Lock & Edit** from the Change Center menu.
4. Select an existing server on the host to be extended, for example: `WLS_OAM1`.
5. Click **Clone**.
6. Enter the following information:
   - **Server Name**: A new name for the server, for example: `WLS_OAM3`.
   - **Server Listen Address**: The name of the host on which the Managed Server runs.
   - **Server Listen Port**: The port the new Managed Server uses. This port must be unique within the host.

     In case of scaling out, use the default port, `14100` (*`OAM_PORT`*). In case of scaling up, choose a unique port.
7. Click **OK**.
8. Click the newly created server **WLS_OAM3**
9. Set **Machine** to be the machine created in Mount Middleware Home and Create a New Machine when Scaling Out (page 17-21).
10. Click **Save**.
11. Disable host name verification for the new Managed Server. Before starting and verifying the `WLS_OAM3` Managed Server, disable host name verification. Re-enable it after having configured server certificates for the communication between the Oracle WebLogic Administration Server and the Node Manager in `IDMHOST`*`n`*.

    If the source server from which the new one was cloned had already disabled host name verification, these steps are not required, as the host name verification settings were propagated to the cloned server. To disable host name verification:

    a. In Oracle Enterprise Manager Fusion Middleware Control, 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_OAM3** 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**.
12. Click **Activate Changes** from the Change Center menu.
13. Run `pack` and `unpack` as described in Running Pack/Unpack (page 17-40).

17.2.5.4.4 Register the Managed Server with Oracle Access Manager

Register the new Managed Server with Oracle Access Manager. Configure the new Managed Server now as an Oracle Access Manager server. Do this from the Oracle OAM console. Proceed as follows:

1. Log in to the OAM console at `http://ADMIN.mycompany.com/oamconsole` as the Oracle Oracle Access Manager administration user.
2. Click the **System Configuration** tab.
3. Click **Server Instances**.
4. Select **Create** from the Actions menu.
5. Enter the following information:
   - **Server Name**: `WLS_OAM3`
   - **Host**: Host that the server runs on
   - **Port**: Listen port that was assigned when the Managed Server was created
   - **OAM Proxy Port**: Port for the Oracle Access Manager proxy to run on. This is unique for the host
   - **Proxy Server ID**: `AccessServerConfigProxy`
   - **Mode**: Set to same mode as existing Oracle Access Manager servers.
6. Click **Coherence** tab.

   Set **Local Port** to a unique value on the host.
7. Click **Apply**.
8. Restart the WebLogic Administration Server as described in Start and Stop Components (page 10-26).

17.2.5.4.5 Update WebGate Profiles

Add the newly created Oracle Access Manager server to all WebGate Profiles that might be using it, such as `Webgate_IDM`, `Webgate_IDM_11g`, and `IAMSuiteAgent`

For example, to add the Oracle Access Manager server to `Webgate_IDM`, access the OAM console at: `http://ADMIN.mycompany.com/oamconsole`

Then proceed as follows:

1. Log in as the Oracle Access Manager Admin User.
2. Click the **System Configuration** tab.
3. Expand **Access Manager Settings**, **SSO Agents**, **OAM Agents**.
4. Click the open folder icon, then click **Search**.

   The WebGate agent **Webgate_IDM** should be shown.
5. Click the agent **Webgate_IDM**.
6. Select **Edit** from the **Actions** menu.
7. Click **+** in the **Primary Server** list (or the **Secondary Server** list if this is a secondary server).

8. Select the newly created managed server from the **Server** list.
9. Set **Maximum Number of Connections** to `20` for all of the OAM Servers listed in the primary servers list (10 x WLS_OAM1 connections + 10 x WLS_OAM2 connections).
10. Click **Apply**.

Repeat Steps 5 to 10 for **Webgate_IDM_11g**, **IAMSuiteAgent**, and all other WebGates that might be in use.

Start now the new Managed Server, as described in Start and Stop Components (page 10-26).

17.2.5.4.6 Update the Web Tier

Add the newly added Managed Server host name and port to the list WebLogicCluster parameter, as described in Add New WebLogic Managed Server to Oracle HTTP Server Configuration Files (page 17-40).

Save the file and restart the Oracle HTTP server, as described in Start and Stop Components (page 10-26).

17.2.5.5 Scale Oracle Identity Manager

A node that runs a Managed Server configured with Oracle SOA Suite and Oracle Identity Manager components already exists. The node contains a Middleware home, a SOA Oracle home, an Oracle Identity Manager Oracle home, and a domain directory for existing Managed Servers. Use the existing installations in shared storage for creating a new WLS_SOA and WLS_OIM managed server. There is no need to install the Oracle Identity and Access Management or Oracle SOA Suite binaries in a new location

When scaling up, add WLS_SOA and WLS_OIM managed servers to existing nodes.

In either case, run pack and unpack.

When scaling out the topology, add new Managed Servers configured with OIM and SOA to new nodes. First check that the new node can access the existing home directories for WebLogic Server, OIM, and SOA. It is not necessary to run pack and unpack to bootstrap the domain configuration in the new node.

Follow the steps in the following subsections to scale the topology:

- Assemble Information for Scaling Oracle Identity Manager (page 17-30)
- Clone an Existing Oracle Identity Manager Server when Scaling Up Oracle Identity Manager or SOA (page 17-30)
- Mount Middleware Home and Create a New Machine when Scaling Out (page 17-31)
- Configure New JMS Servers (page 17-31)
- Perform Pack/Unpack When Scaling Out (page 17-32)
- Configure Oracle Coherence for Deploying Composites (page 17-32)
- Complete the Oracle Identity Manager Configuration Steps (page 17-35)

17.2.5.5.1 Assemble Information for Scaling Oracle Identity Manager

Assemble the following information before scaling Oracle Identity Manager.

Description	Variable	Documented Value	Customer Value
Host name	`IDMHOST`*n*	`IDM_PROVISIONED_HOST`	
SOA virtual server name		SOAHOST*x*VHN	
OIM virtual server name		OIMHOST*x*VHN	
SOA managed server to clone	`WLS_SOA`*n*	`WLS_SOA_PROVISIONED_HOST`	
OIM managed server to clone	`WLS_OIM`*n*	`WLS_OIM_PROVISIONED_HOST`	
SOA managed server name	`WLS_SOA`*n*	`WLS_SOA_SCALED_OUT_HOST2`	
OIM managed server name	`WLS_OIM`*n*	`WLS_OIM_SCALED_OUT_HOST`	
Numeric extension for new JMS servers	*n*	3	
WebLogic Admin Host		ADMINVHN.mycompany.com	
WebLogic Admin Port	*WLS_ADMIN_PORT*	7001	
WebLogic Admin User		weblogic_idm	
WebLogic Admin Password			

17.2.5.5.2 Clone an Existing Oracle Identity Manager Server when Scaling Up Oracle Identity Manager or SOA

Follow this procedure twice, once to clone *WLS_SOA_PROVISIONED_HOST* and once again to clone *WLS_OIM_PROVISIONED_HOST*.

1. Log in to the Administration Console at: `http://ADMIN.mycompany.com/console`
2. Clone the *WLS_OIM_PROVISIONED_HOST* or the *WLS_SOA_PROVISIONED_HOST* into a new Managed Server. The source Managed Server to clone should be one that already exists on the node where the new Managed Server is run.

   To clone a Managed Server:

   a. Select **Environment**, **Servers** from the Administration Console.
   b. From the Change Center menu, click **Lock and Edit**.
   c. Select the Managed Server to clone (for example, *WLS_OIM_PROVISIONED_HOST* or *WLS_SOA_PROVISIONED_HOST*).
   d. Select **Clone**.

Name the new Managed Server *WLS_OIM_PROVISONED_HOSTn* or *WLS_SOA_PROVISIONED_HOSTn*, where *n* is a number to identify the new Managed Server.

The rest of the steps assume that a new server is being added to *IDM_PROVISIONED_HOST*, which is already running *WLS_SOA_PROVISIONED_HOST* and *WLS_OIM_PROVISIONED_HOST*.

3. For the listen address, assign the host name or IP address to use for this new Managed Server. To use server migration as recommended for this server, this should be 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.

17.2.5.5.3 Mount Middleware Home and Create a New Machine when Scaling Out

Mount the Middleware home, as described in Mount Middleware Home and Create a New Machine when Scaling Out (page 17-21).

17.2.5.5.4 Configure New JMS Servers

Create JMS Servers for SOA, Oracle Identity Manager, UMS, and BPM on the new Managed Server. Do this as follows:

1. Log in to the WebLogic Administration Server and navigate to **Services**, **Messaging**, **JMS Servers**.
2. Click **New**.
3. Enter a value for **Name**, such as `BPMJMSServer_auto_3`.
4. Click **Create New Store**.
5. Select `FileStore` from the list
6. Click **Next**.
7. Enter a value for **Name**, such as `BPMJMSFileStore_auto_3`
8. Enter the following values:

   Target: The new server that is being created.

   Directory: *ASERVER_HOME*`/jms/BPMJMSFileStore_auto_3`
9. Click **OK**.
10. When returned to the JMS Server screen, select the newly created file store from the list.
11. Click **Next**.
12. On the next screen set the Target to the server that is being created.
13. Click **Finish**.

Create the following JMS Queues depending on the managed server that is being created:

Server	JMS Server Name	File Store Name	Directory	Target
WLS_SOA*n*	BPMJMSServer_auto_*n*	BPMJMSFileStore_auto_*n*	*ASERVER_HOME*`/jms/BPMJMSFileStore_auto_`*n*	WLS_SOA*n*

Server	JMS Server Name	File Store Name	Directory	Target
WLS_SOA*n*	SOAJMSServer_auto_*n*	SOAJMSFileStore_auto_*n*	*ASERVER_HOME*/jms/SOAJMSFileStore_auto_*n*	WLS_SOA*n*
WLS_SOA*n*	UMSJMSServer_auto_*n*	UMSJMSFileStore_auto_*n*	*ASERVER_HOME*/jms/UMSJMSFileStore_auto_*n*	WLS_SOA*n*
wls_OIM*n*	OIMJMSServer_auto_*n*	OIMJMSFileStore_auto_*n*	*ASERVER_HOME*/jms/OIMJMSFileStore_auto_*n*	wls_OIM*n*
wls_SOA*n*	PS6SOAJMSServer_auto_*n*	PS6SOAJMSFileStore_auto_*n*	*ASERVER_HOME*/jms/PS6SOAJMSFileStore_auto_*n*	wls_SOA*n*

Add the newly created JMS Queues to the existing JMS Modules by performing the following steps:

1. Log in to the WebLogic Administration Console.
2. Navigate to **Services**, **Messaging**, **JMS Modules**.
3. Click a JMSModule, such as **SOAJMSModule**
4. Click the **Sub Deployments** tab.
5. Click the listed sub deployment.

   This subdeployment module name is a random name in the form of **JMSServerName*XXXXXX*** resulting from the Configuration Wizard JMS configuration.
6. Assign the newly created JMS server, for example **SOAJMSServer_auto*n***.
7. Click **Save**.
8. Perform this for each of the JMS modules listed in the following table:

JMS Module	JMS Server
BPMJMSModule	BPMJMSServer_auto_*n*
JRFWSAsyncJmsModule	JRFWSAsyncJmServer_auto_*n*
OIMJMSModule	OIMJMSServer_auto_*n*
SOAJMSModule	SOAJMSServer_auto_*n*
UMSJMSSystemResource	UMSJMSServe_auto_*n*

9. Click **Activate Configuration** from the Change Center menu.

17.2.5.5.5 Perform Pack/Unpack When Scaling Out

This section is necessary only when scaling out.

Run `pack` and `unpack` as described in Run Pack/Unpack (page 17-40).

17.2.5.5.6 Configure Oracle Coherence for Deploying Composites

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

Unicast communication does not enable nodes to discover other cluster members in this way. Consequently, specify the nodes that belong to the cluster. It is not necessary to specify all of the nodes of a cluster, however. Specify only 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 system, configure Oracle Coherence to use a specific host name to create the Oracle Coherence cluster.

An incorrect configuration of the Oracle Coherence framework 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 configuration described in this section.

17.2.5.5.6.1 Enable Communication for Deployment Using Unicast Communication

Specify the nodes using the `tangosol.coherence.wka`*n* system property, where *n* is a number between 1 and 9. 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, for example: SOAHOST3VHN. 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. The new server need also to be added to the existing entries.

> **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.

SOA_SCALED_OUT_HOST2VHN is the virtual host name that maps to the virtual IP where *WLS_SOA_SCALED_OUT_HOST2* is listening.

17.2.5.5.6.2 Specify the Host Name Used by Oracle Coherence

Use the Administration Console to specify a host name used by Oracle Coherence.

To add the host name used by Oracle Coherence:

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_SOA_PROVISIONED_HOST* or *WLS_SOA_SCALED_OUT_HOST*, which are represented as hyperlinks) in Name column of the table. The settings page for the selected server appears.
5. Click **Lock & Edit**.
6. Click the **Server Start** tab.

7. Enter the following for *WLS_SOA_PROVISIONED_HOST*, *WLS_SOA_SCALED_OUT_HOST1*, and *WLS_SOA_SCALED_OUT_HOST2* into the Arguments field.

   For *WLS_SOA_PROVISIONED_HOST*, enter the following:

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN
   -Dtangosol.coherence.wka2=SOAHOST2VHN
   -Dtangosol.coherence.wka3=SOAHOST3VHN
   -Dtangosol.coherence.localhost=SOAHOST1VHN
   ```

   For *WLS_SOA_SCALED_OUT_HOST1*, enter the following:

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN
   -Dtangosol.coherence.wka2=SOAHOST2VHN
   -Dtangosol.coherence.wka3=SOAHOST3VHN
   -Dtangosol.coherence.localhost=SOAHOST2VHN
   ```

   For *WLS_SOA_SCALED_OUT_HOST2*, enter the following:

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN
   -Dtangosol.coherence.wka2=SOAHOST2VHN
   -Dtangosol.coherence.wka3=SOAHOST3VHN
   -Dtangosol.coherence.localhost=SOAHOST3VHN
   ```

   There should be no breaks in lines between the different `-D` parameters. Do not copy or paste the text to the Administration Console's arguments text field. It 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.

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

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN
   -Dtangosol.coherence.wka2=SOAHOST2VHN
   -Dtangosol.coherence.wka3=SOAHOST3VHN
   -Dtangosol.coherence.localhost=SOAHOST1VHN
   -Dtangosol.coherence.localport=8089
   -Dtangosol.coherence.wka1.port=8089
   -Dtangosol.coherence.wka2.port=8089
   -Dtangosol.coherence.wka3.port=8089
   ```

   WLS_SOA_SCALED_OUT_HOST1 (enter the following into the Arguments field on a single line, without a carriage return):

   ```
   -Dtangosol.coherence.wka1=SOAHOST1VHN
   -Dtangosol.coherence.wka2=SOAHOST2VHN
   -Dtangosol.coherence.wka3=SOAHOST3VHN
   -Dtangosol.coherence.localhost=SOAHOST2VHN
   -Dtangosol.coherence.localport=8089
   -Dtangosol.coherence.wka1.port=8089
   -Dtangosol.coherence.wka2.port=8089
   -Dtangosol.coherence.wka3.port=8089
   ```

   WLS_SOA_SCALED_OUT_HOST2 (enter the following into the Arguments field on a single line, without a carriage return):

```
-Dtangosol.coherence.wka1=SOAHOST1VHN
-Dtangosol.coherence.wka2=SOAHOST2VHN
-Dtangosol.coherence.wka3=SOAHOST3VHN
-Dtangosol.coherence.localhost=SOAHOST3VHN
-Dtangosol.coherence.localport=8089
-Dtangosol.coherence.wka1.port=8089
-Dtangosol.coherence.wka2.port=8089
-Dtangosol.coherence.wka3.port=8089
```

For more information about Coherence Clusters, see Introduction to Coherence in the *Oracle Fusion Middleware Developing Applications with Oracle Coherence* guide.

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

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.

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.

17.2.5.5.7 Complete the Oracle Identity Manager Configuration Steps

1. Configure TX persistent store for the new server. This should be a location visible from other nodes as indicated in the recommendations about shared storage.

   From the WebLogic Administration Console, select the **Server_name**, **Services** tab. Under Default Store, in **Directory**, enter the path to the folder used to store the data files from the default persistent store.

2. Disable host name verification for the new Managed Server. Before starting and verifying the `WLS_SOA`*n* Managed Server, disable host name verification. It can be re-enabled after configuring server certificates for the communication between the Oracle WebLogic Administration Server and the Node Manager in `IDMHOST`*n*. If the source server from which the new one has been cloned had already disabled host name verification, these steps are not required (the host name verification settings is propagated to the cloned server).

   To disable host name verification:

   a. In the Oracle 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_SOA*n*** in the Names column of the table. The Settings page for the server appears.

   e. Click the **SSL** tab.

   f. Click **Advanced**.

   g. Set **Hostname Verification** to `None`.

   h. Click **Save**.

3. Repeat Steps 6a through 6h to disable host name verification for the `WLS_OIMn` Managed Servers. In Step d, select **WLS_OIM*n*** in the Names column of the table.
4. Click **Activate Changes** from the Change Center menu.
5. Restart the WebLogic Administration Server as described in Start and Stop Components (page 10-26).
6. Start and test the new Managed Server from the Administration Console.
   a. Shut down the existing Managed Servers in the cluster.
   b. Ensure that the newly created Managed Server, `WLS_SOAn`, is up.
   c. Access the application on the newly created Managed Server (`http://vip:port/soa-infra`). The application should be functional.
7. Configure the newly created managed server for server migration. Follow the steps in Configure Server Migration Targets (page 17-49) to configure server migration.

   Since this new node is using an existing shared storage installation, the node is already using a Node Manager and an environment configured for server migration that includes netmask, interface, `wlsifconfig` script superuser privileges. The floating IP addresses for the new Managed Servers are already present in the new node.
8. Test server migration for this new server. Follow these steps from the node where the new server was added:
   a. Stop the `WLS_SOAn` Managed Server.

      To do this, run:

      ```
      kill -9 pid
      ```

      on the process ID (PID) of the Managed Server. Identify the PID of the node using

      ```
      ps -ef | grep WLS_SOAn
      ```
   b. Watch the Node Manager Console. A message indicating that the floating IP address for *`WLS_SOA_PROVISIONED_HOST`* has been disabled is displayed.
   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.
   e. Repeat Steps a-d for WLS_OIM*n*.

17.2.5.6 Scale Oracle Identity Federation

The Oracle Identity Federation instances can be scaled out by adding a new node with a Managed Server to the existing cluster.

The existing installations (WebLogic Server home, Oracle Fusion Middleware home, and domain directories) can be used for creating a new Managed Server for Oracle Identity Federation.

The Oracle Identity Federation instances can be scaled out by adding a new node with a Managed Server to the existing cluster.

Perform the steps in the following sections to scale Oracle Identity Federation.

- Assemble Information for Scaling Oracle Identity Federation (page 17-37)
- Configure Oracle Identity Federation (page 17-37)
- Perform Pack/Unpack when Scaling Out (page 17-39)
- Complete Oracle Identity Federation Server Configuration (page 17-39)
- Add New Managed Server to OHS Configuration (page 17-39)

17.2.5.6.1 Assemble Information for Scaling Oracle Identity Federation

Assemble the following information before scaling Oracle Identity Federation.

Description	Variable	Documented Value	Customer Value
Host name		*IDM_SCALED_OUT_HOST*.mycompany.com	
OIF Port	*OIF_PORT*	7499	This value is available in the *Oracle Fusion Applications Installation Workbook*, **Network - Ports** tab, **Identity Management Port Numbers** table, **IDMDomain OIF** row.
Instance name	oif*n*	oif3	
WebLogic Admin Host		ADMINVHN.mycompany.com	
WebLogic Admin Port	*WLS_ADMIN_PORT*	7001	
WebLogic Admin User		weblogic_idm	
WebLogic Admin Password			

17.2.5.6.2 Configure Oracle Identity Federation

1. Ensure that the system, patch, kernel and other requirements are met. See Verifying Certification, System Requirements, and Interoperability in the in the *Oracle Fusion Middleware Installation Guide for Oracle Identity Management* in the Oracle Fusion Middleware documentation library for the platform and version being used.
2. Create a file containing the ports used by Oracle Internet Directory. On Disk1 of the installation media, locate the file `stage/Response/staticports.ini`. Copy it to a file called `oif_ports.ini`. Delete all entries in `oif_ports.ini` except for `Oracle Identity Federation Server Port`. Change the value of that port to the port used for this instance.

   If scaling out, use the default port, 7499 (*OIF_PORT*). If scaling up, choose a unique port for this instance.

   If the port name in the file is slightly different from those listed in this step, use the name in the file.
3. Ensure that the appropriate shared storage volumes are mounted on the new *IDMHOST*, as described in Mount Middleware Home and Create a New Machine when Scaling Out (page 17-21).

4. Ensure that the to be used is not in use by any service on the computer by issuing these commands for the operating system used, specifying the port to be used. If a port is not in use, no output is returned from the command.

   UNIX:

   ```
   netstat -an | grep "7499"
   ```

   If the port is in use (if the command returns output identifying the port), it must be free.

   UNIX:

   Remove the entries for port `7499` in the `/etc/services` file.

5. Start the Oracle Identity Management 11*g* Configuration Wizard located under the *`IDM_ORACLE_HOME`*`/bin` directory as follows:

   Issue this command:

   ```
   ./config.sh
   ```

6. On the Welcome screen, click **Next**.

7. On the Select Domain screen, select the **Expand Cluster** option and specify these values:

   - **HostName**: `ADMINVHN.mycompany.com`
   - **Port**: `7001`
   - **UserName**: `weblogic_idm`
   - **User Password**: *`weblogic_user_password`*

   Click **Next**.

8. A dialog box with the following message appears:

   ```
   The selected domain is not a valid Identity Management domain or the
   installer cannot determine if it is a valid domain. If you created the
   domain using the Identity Management installer, you can ignore this message
   and continue. If you did not create the domain using the Identity Management
   installer, refer to the Identity Management documentation for information on
   how to verify the domain is valid.
   ```

   This is a benign warning that can be ignored.

   Click **Yes** to continue.

9. On the Specify Installation Location screen, specify the following values:

   - **Oracle Middleware Home Location**: *`OIF_MW_HOME`* (This value is prefilled and cannot be updated.)
   - **Oracle Home Directory**: `idm` (This value is prefilled and cannot be updated.)
   - **WebLogic Server Directory**: *`OIF_MW_HOME`*`/wlserver_10.3`
   - **Oracle Instance Location**: *`OIF_ORACLE_INSTANCE`*
   - **Instance Name**: `oif`*`n`*, where *n* is a sequential number, for example `oif3`.

   Click **Next**.

10. On the Specify Security Updates screen (if shown), specify the values shown in this example:

- **Email Address**: Provide the email address for the My Oracle Support account.
- **Oracle Support Password**: Provide the password for the My Oracle Support account.
- Select **I wish to receive security updates via My Oracle Support**.

Click **Next**.

11. On the Configure Components screen, de-select all the components except Oracle Identity Federation components. Select only Oracle Identity Federation from the Oracle Identity Federation components. Do not select Oracle HTTP Server.

    Click **Next**.

12. On the Configure Ports screen, use the `oif_ports.ini` file created in Step 2 to specify the ports to be used. This enables to bypass automatic port configuration.
    a. Select **Specify Ports using a Configuration File**.
    b. In the file name field specify `oif_ports.ini`.
    c. Click **Save**, then click **Next**.
13. On the Installation Summary screen, review the selections to ensure that they are correct. If they are not correct, click **Back** to modify selections on previous screens. Then click **Configure**.
14. On the Configuration Progress screen, view the progress of the configuration.
15. On the Installation Complete screen, click **Finish** to confirm the choice to exit.

17.2.5.6.3 Perform Pack/Unpack when Scaling Out

This section is necessary only when scaling out.

From *IDM_PROVISIONED_HOST*, copy the applications directory under the *ASERVER_HOME*`/config/fmwconfig/servers/wls_oif1` directory to the *ASERVER_HOME*`/config/fmwconfig/servers/wls_oif`*n* directory, where `wls_oif`*n* is the new server being added, for example:

```
cp -rp ASERVER_HOME/config/fmwconfig/servers/wls_oif1/applications
user@IDM_PROVISIONED_HOST:ASERVER_HOME/config/fmwconfig/servers/wls_oif3
```

Then run `pack` and `unpack` as described in Run Pack/Unpack (page 17-40).

17.2.5.6.4 Complete Oracle Identity Federation Server Configuration

Perform the steps in Validate Oracle Identity Federation (page 16-24) and Configure the Enterprise Manager Agents (page 16-25) to completed the configuration of your new server.

17.2.5.6.5 Add New Managed Server to OHS Configuration

Add the newly added Managed Server host name and port to the list WebLogicCluster parameter, as described in Add New WebLogic Managed Server to Oracle HTTP Server Configuration Files (page 17-40).

17.2.5.7 Run Pack/Unpack

Whenever a domain is extended to include a new managed server, extract the domain configuration needs from the *ASERVER_HOME* location to the *MSERVER_HOME* location. This applies for scaling up or out. To do this perform the following steps.

1. Pack the domain on *IDM_PROVISIONED_HOST* to create a template pack using the command:

   ```
   pack.sh -domain=ASERVER_HOME -template =/templates/managedServer.jar -
   template_name="template_name" -managed=true
   ```

   The `pack.sh` script is located in *ORACLE_COMMON_HOME*`/common/bin`.

2. Unpack the domain on the new host for scale out, or on the existing host for scale up, using the command:

   ```
   unpack.sh -domain=MSERVER_HOME -template=/templates/managedServer.jar -
   app_dir=MSERVER_HOME/applications
   ```

   The `unpack.sh` script is located in *ORACLE_COMMON_HOME*`/common/bin`.

3. In case of scaling out, start Node Manager and update the property file.

   a. Start and stop Node Manager as described in Start and Stop Components (page 10-26).

   b. Run the script `setNMProps.sh`, which is located in *ORACLE_COMMON_HOME*`/common/bin`, to update the node manager properties file, for example:

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

   c. Start Node Manager once again as described in Start and Stop Components (page 10-26).

17.2.5.8 Add New WebLogic Managed Server to Oracle HTTP Server Configuration Files

Scaling an Application Tier component typically requires to create a new WebLogic managed server. If a new managed server is added to the topology, after adding the managed server, update the Oracle HTTP Server configuration files (on all nodes) and add the new server to the existing WebLogic cluster directives.

In the Web tier, there are several configuration files under *WEB_ORACLE_INSTANCE*`/config/OHS/componentname/moduleconf`, including `admin_vh.conf`, `sso_vh.conf` and `idminternal_vh.conf`. Each contain a number of entries in location blocks. If a block references two server instances and add a third one is added, update that block with the new server.

For example if a new Oracle Access Manager server is added, update `sso_vh.conf` to include the new managed server. Add the new server to the `WebLogicCluster` directive in the file, for example, change:

```
<Location /oam>
   SetHandler weblogic-handler
   WebLogicCluster
IDM_PROVISIONED_HOST.mycompany.com:14100,IDM_SCALED_OUT_HOST.mycompany.com:14100
</Location>
```

```
<Location /fusion_apps>
   SetHandler weblogic-handler
   WebLogicCluster
IDM_PROVISIONED_HOST.mycompany.com:14100,IDM_SCALED_OUT_HOST.mycompany.com:14100
</Location>
```

to:

```
<Location /oam>
   SetHandler weblogic-handler
   WebLogicCluster
IDM_PROVISIONED_HOST.mycompany.com:14100,IDM_SCALED_OUT_HOST.mycompany.com:14100,
IDM_PROVISIONED_HOST.mycompany.com:14101
</Location>

<Location /fusion_apps>
   SetHandler weblogic-handler
   WebLogicCluster
IDM_PROVISIONED_HOST.mycompany.com:14100,IDM_SCALED_OUT_HOST.mycompany.com:14100,
IDM_SCALED_OUT_HOST.mycompany.com:14100
</Location>
```

Similarly, if y a new ODSM server is added, update ODSM entries in the file `admin_vh.conf`.

Once the configuration file has been updated, restart the Oracle HTTP server(s) as described in Start and Stop Components (page 10-26). Oracle recommends to do this sequentially to prevent loss of service.

17.2.6 Scale the Web Tier

The Web Tier already has a node running an instance of the Oracle HTTP Server. The existing Oracle HTTP Server binaries can be used for creating the new Oracle HTTP Server instance.

To scale the Oracle HTTP Server, perform the steps in the following subsections:

- Assemble Information for Scaling the Web Tier (page 17-41)
- Mount Middleware Home and Copy Oracle HTTP Server Files when Scaling Out (page 17-42)
- Run the Configuration Wizard to Configure the HTTP Server (page 17-42)
- Register Oracle HTTP Server with WebLogic Server (page 17-43)
- Reconfigure the Load Balancer (page 17-44)

17.2.6.1 Assemble Information for Scaling the Web Tier

Assemble the following information before scaling the Web Tier.

Description	Variable	Documented Value	Customer Value
Host name		WEBHOST1.mycompany.com	NA
OHS port	*OHS_PORT*	7777	NA
Instance Name	web*n*	web1 or web2	NA

Description	Variable	Documented Value	Customer Value
Component Name	webn	web1 or web2	NA
WebLogic Admin Host	NA	ADMINVHN.mycompany.com	NA
WebLogic Admin Port	*WLS_ADMIN_PORT*	7001	NA
WebLogic Admin User		weblogic_idm	NA
WebLogic Admin Password	NA	NA	NA

17.2.6.2 Mount Middleware Home and Copy Oracle HTTP Server Files when Scaling Out

1. On the new node, mount the existing Middleware home.
2. Copy all files created in *ORACLE_INSTANCE*/config/OHS/*component*/moduleconf from the existing Web Tier configuration to the new one.

17.2.6.3 Run the Configuration Wizard to Configure the HTTP Server

Perform these steps to configure the Oracle Web Tier:

1. Create a file containing the ports used by Oracle HTTP Server. On Disk1 of the installation media, locate the file stage/Response/staticports.ini. Copy it to a file called ohs_ports.ini. Delete all entries in ohs_ports.ini except for OHS PORT and OPMN Local Port. Change the value of OPMN Local Port to 6700. In case of scaling out, use the default value, 7777, for OHS PORT. In case of scaling up, choose a unique value for that instance on the machine.

   If the port names in the file are slightly different from OHS PORT and OPMN Local Port, use the names in the file.
2. Change the directory to the location of the Oracle Fusion Middleware Configuration Wizard:

   ```
   cd WEB_ORACLE_HOME/bin
   ```
3. Start the Configuration Wizard:

   ```
   ./config.sh
   ```

Enter the following information into the configuration wizard:

1. On the Welcome screen, click **Next**.
2. On the Configure Component screen, select: **Oracle HTTP Server**.

   Ensure that Associate Selected Components with WebLogic Domain is selected.

   Ensure Oracle Web Cache is **NOT** selected.

   Click **Next**.
3. On the Specify WebLogic Domain Screen, enter
   - **Domain Host Name**: ADMINVHN.mycompany.com

- **Domain Port No**: `7001`, where `7001` is *`WLS_ADMIN_PORT`*.
- **User Name**: Weblogic Administrator User (For example: `weblogic`)
- **Password**: Password for the Weblogic Administrator User account

Click **Next**.

4. On the Specify Component Details screen, specify the following values:

   Enter the following values for WEBHOST*n*, where *n* is the number of the new host, for example, 3:

   - **Instance Home Location**: *WEB_ORACLE_INSTANCE* (`/u02/local/oracle/config/instances/ohs`*n*, for example, `/u02/local/oracle/config/instances/ohs1`)
   - **Instance Name**: `web`*n*
   - **OHS Component Name**: `web`*n*

   Click **Next**.

5. On the Configure Ports screen, use the `ohs_ports.ini` file created in Step 1to specify the ports to be used. This enables to bypass automatic port configuration.

   a. Select **Specify Ports using a Configuration File**.

   b. In the file name field specify `ohs_ports.ini`.

   c. Click **Save**, then click **Next**.

6. On the Specify Security Updates screen, specify these values:

   - **Email Address**: The email address for the My Oracle Support account.
   - **Oracle Support Password**: The password for the My Oracle Support account.

   Select: **I wish to receive security updates via My Oracle Support**.

   Click **Next**.

7. On the Installation Summary screen, review the selections to ensure that they are correct. If they are not, click **Back** to modify selections on previous screens.

   Click **Configure**.

   On the Configuration screen, the wizard launches multiple configuration assistants. This process can be lengthy. When it completes, click **Next**.

   On the Installation Complete screen, click **Finish** to confirm the choice to exit.

17.2.6.4 Register Oracle HTTP Server with WebLogic Server

- For Oracle Enterprise Manager Fusion Middleware Control to be able to manage and monitor the new Oracle HTTP server, register the Oracle HTTP server with IDMDomain. To do this, register Oracle HTTP Server with WebLogic Server by running the following command on the host where the new server is running:

```
cd WEB_ORACLE_INSTANCE/bin
./opmnctl registerinstance -adminHost ADMINVHN.mycompany.com \
   -adminPort 7001 -adminUsername weblogic
```

17.2.6.5 Reconfigure the Load Balancer

Add the new Oracle HTTP Server instance to the existing server pool defined on the load balancer for distributing requests across the HTTP instances.

17.2.7 Post-Scaling Steps for All Components

Provisioning creates a set of scripts to start and stop managed servers defined in the domain. When a new managed server is created in the domain needed to update the domain configuration so that these start and stop scripts can also start the newly created managed server.

1. To update the domain configuration, edit the file `serverInstancesCustom.txt`, which is located in the directory: *`SHARED_CONFIG_DIR`*`/scripts`
2. To start a node manager on a new machine, add an entry which looks like this:

   ```
   newmachine.mycompany.com NM nodemanager_pathname nodemanager_port
   For example:
   IDM_SCALED_OUT_HOST.mycompany.com NM /u01/oracle/config/nodemanager/
   IDM_SCALED_OUT_HOST.mycompany.com 5556
   ```

3. To start a managed server called *`WLS_OIM_SCALED_OUT_HOST`* add an entry which looks like this:

   ```
   newmachine.mycompany.com OIM ManagedServerName
   ```

   For example:

   ```
   IDM_SCALED_OUT_HOST OIM WLS_OIM_SCALED_OUT_HOST
   ```

4. Save the file.

17.3 Set Up Server Migration for Identity Management

Configuring server migration allows SOA-managed and OIM-managed servers to be migrated from one host to another, so that if a node hosting one of the servers fails, the service can continue on another node. This section describes how to configure server migration for an Identity Management enterprise deployment.

17.3.1 Overview of Server Migration for an Enterprise Deployment

Perform the steps in the following sections to configure server migration for the following Managed Servers:

- *`WLS_OIM_PROVISIONED_HOST`*
- *`WLS_SOA_PROVISIONED_HOST`*
- *`WLS_OIM_SCALED_OUT_HOST`*
- *`WLS_SOA_SCALED_OUT_HOST`*

The *`WLS_OIM_PROVISIONED_HOST`* and *`WLS_SOA_PROVISIONED_HOST`* Managed Server are configured to restart on *`IDM_SCALED_OUT_HOST`* should a failure occur.

The *`WLS_OIM_SCALED_OUT_HOST`* and *`WLS_SOA_SCALED_OUT_HOST`* Managed Servers are configured to restart on *`IDM_PROVISIONED_HOST`* should a failure occur.

The *WLS_OIM_PROVISIONED_HOST*, *WLS_SOA_PROVISIONED_HOST*, *WLS_OIM_SCALED_OUT_HOST* and *WLS_SOA_SCALED_OUT_HOST* servers listen on specific floating IPs that are failed over by WebLogic Server Migration.

17.3.2 Set Up a User and Tablespace for the Server Migration Leasing Table

In this section, a user and tablespace are setup for the server migration leasing table:

If other servers in the same domain have already been configured with server migration, the same tablespace and data sources can be used. In that case, the data sources and multi data source for database leasing do not need to be re-created, but they must be retargeted to the clusters being configured with server migration.

1. Create a tablespace called `leasing`. For example, log on to SQL*Plus as the sysdba user and run the following command:

   ```
   create tablespace leasing
   logging datafile 'DB_HOME/oradata/orcl/leasing.dbf'
   size 32m autoextend on next 32m maxsize 2048m extent management local;
   ```

2. Create a user named `leasing` and assign to it the `leasing` tablespace:

   ```
   create user leasing identified by password;
   grant create table to leasing;
   grant create session to leasing;
   alter user leasing default tablespace leasing;
   alter user leasing quota unlimited on LEASING;
   ```

3. Create the `leasing` table using the `leasing.ddl` script:

   a. Copy the `leasing.ddl` file located in either of the following directories to the database node:

      ```
      WL_HOME/server/db/oracle/817
      WL_HOME/server/db/oracle/920
      ```

   b. Connect to the database as the `leasing` user.

   c. Run the `leasing.ddl` script in SQL*Plus:

      ```
      @Copy_Location/leasing.ddl;
      ```

17.3.3 Create a Multi Data Source Using the Oracle WebLogic Administration Console

The second step is to create a multi data source for the leasing table from the Oracle WebLogic Server Administration Console. Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27). Create a data source to each of the Oracle RAC database instances during the process of setting up the multi data source, both for these data sources and the global leasing multi data source. When a data source is created:

- Ensure that this is a non-XA data source.
- The names of the multi data sources are in the format of *MultiDS*-`rac0`, *MultiDS*-`rac1`, and so on.
- Use Oracle's Driver (Thin) Version 9.0.1, 9.2.0, 10, 11.

- Data sources do not require support for global transactions. Therefore, do *not* use any type of distributed transaction emulation/participation algorithm for the data source (do not choose the **Supports Global Transactions** option, or the **Logging Last Resource**, **Emulate Two-Phase Commit**, or **One-Phase Commit** options of the **Supports Global Transactions** option), and specify a service name for the database.
- Target these data sources to the oim_cluster and the soa_cluster.
- Ensure the data source's connection pool initial capacity is set to 0 (zero). To do this, select **Services**, **JDBC**, and then **Datasources**. In the Datasources screen, click the **Datasource Name**, then click the **Connection Pool** tab, and enter **0** (zero) in the **Initial Capacity** field.

Creating a Multi Data Source

Perform these steps to create a multi data source:

1. From Domain Structure window in the Oracle WebLogic Server Administration Console, expand the **Services** node. The Summary of JDBC Data Source page appears.
2. Click **Data Sources**. The Summary of JDBC Multi Data Source page is displayed.
3. Click **Lock and Edit**.
4. Click **New Multi Data Source**. The Create a New JDBC Multi Data Source page is displayed.
5. Enter `leasing` as the name.
6. Enter `jdbc/leasing` as the JNDI name.
7. Select **Failover** as algorithm (default).
8. Click **Next.**
9. Select **oim_cluster** and **soa_cluster** as the targets.
10. Click **Next**.
11. Select **non-XA driver** (the default).
12. Click **Next**.
13. Click **Create New Data Source**.
14. Enter `leasing-rac0` as the name. Enter `jdbc/leasing-rac0` as the JNDI name. Enter `oracle` as the database type. For the driver type, select Oracle Driver (Thin) for Oracle RAC Service-Instance connections, Versions:10 and later.

    When creating the multi data sources for the leasing table, enter names in the format of *`MultiDS`*`-rac0`, *`MultiDS`*`-rac1`, and so on.
15. Click **Next**.
16. On JDBC Data Source Properties, select **Database Driver: Oracle's Driver (Thin) for RAC Service-Instance connections**.
17. Deselect **Supports Global Transactions**.
18. Click **Next**.
19. Enter the service name, database name, host port, and password for the leasing schema.
20. Click **Next**.

21. Click **Test Configuration** and verify that the connection works.
22. Click **Next**.
23. Target the data source to **oim_cluster** and **SOA cluster**.
24. Click **Finish**.
25. Select the data source that was just created, for example `leasing-rac0`, and add it to the right screen.
26. Click **Create a New Data Source** for the second instance of the Oracle RAC database, target it to the oim_cluster and soa_cluster, repeating the steps for the second instance of the Oracle RAC database.
27. Add the second data source to the multi data source.
28. Click **Activate Changes**.

17.3.4 Edit Node Manager's Properties File

In this section, Node Manager's properties file are edited. This must be done for the Node Managers on the nodes where the servers are running, *IDM_PROVISIONED_HOST* and *IDM_SCALED_OUT_HOST*.

The `nodemanager.properties` file is located in the directory

SHARED_CONFIG_DIR`/nodemanager/`*hostname*

where *hostname* is the name of the host where the node manager is running.

Add the following properties to enable server migration to work properly:

- `Interface:`

  `Interface=eth0`

  This property specifies the interface name for the floating IP (for example, eth0).

  Do not specify the sub-interface, such as `eth0:1` or `eth0:2`. This interface is to be used without `:0` or `:1`. Node Manager's scripts traverse the different :*X*-enabled IPs to determine which to add or remove. For example, the valid values in Linux environments are `eth0`, `eth1`, `eth2`, `eth3`, `eth`*n*, depending on the number of interfaces configured.

- `NetMask:`

  `NetMask=255.255.255.0`

  This property specifies the net mask for the interface for the floating IP. The net mask should the same as the net mask on the interface.

- `UseMACBroadcast:`

  `UseMACBroadcast=true`

  This property specifies whether to use a node's MAC address when sending ARP packets, that is, whether to use the `-b` flag in the `arping` command.

Verify in Node Manager's output (shell where Node Manager is started) that these properties are being used, or problems may arise during migration. A similar message should be displayed in Node Manager's output:

```
StateCheckInterval=500
eth0=*,NetMask=255.255.255.0
UseMACBroadcast=true
```

- `LogToStderr` must be set to true (in `node.propertes`), in order to see the properties in the output.
- The following steps are not required if the server properties (start properties) have been properly set and Node Manager can start the servers remotely.

1. If not done already, set the `StartScriptEnabled` property in the `nodemanager.properties` file to true. This is required to enable Node Manager to start the managed servers.
2. Start Node Manager on *`IDM_PROVISIONED_HOST`* and *`IDM_SCALED_OUT_HOST`* by running the `startNodeManagerWrapper.sh` script, which is located in the *`SHARED_CONFIG_DIR/nodemanager/hostname`* directory.

When running Node Manager from a shared storage installation, multiple nodes are started using the same `nodemanager.properties` file. However, each node may require different NetMask or `Interface` properties. In this case, specify individual parameters on a per-node basis using environment variables. For example, to use a different interface (`eth3`) in HOST*n*, use the `Interface` environment variable by setting `JAVA_OPTIONS` to: `-DInterface=eth3`.

Then start Node Manager.

17.3.5 Set Environment and Superuser Privileges for the wlsifconfig.sh Script

On Linux, set environment and superuser privileges for the `wlsifconfig.sh` script:

Ensure that the PATH environment variable includes the files listed in Table 17-1 (page 17-48).

Table 17-1 Files Required for the PATH Environment Variable

File	Located in this directory
`wlsifconfig.sh`	*`MSERVER_HOME`*`/bin/server_migration`
`wlscontrol.sh`	*`WL_HOME`*`/common/bin`
`nodemanager.domains`	*`SHARED_CONFIG_DIR`*`/nodemanager/HostName`

For security reasons, `sudo` should be restricted to the subset of commands required to run the `wlsifconfig.sh` script. For example, perform the following steps to set the environment and superuser privileges for the `wlsifconfig.sh` script.

Ask the system administrator for the appropriate `sudo` and system rights to perform this step.

Grant `sudo` privilege to the WebLogic user `oracle` with no password restriction, and grant execute privilege on the `/sbin/ifconfig` and `/sbin/arping binaries`.

Make sure the script is executable by the WebLogic user ('oracle'). The following is an example of an entry inside `/etc/sudoers` granting sudo execution privilege for `oracle` and also over `ifconfig` and `arping`.

To grant sudo privilege to the WebLogic user ('oracle') with no password restriction, and grant execute privilege on the `/sbin/ifconfig` and `/sbin/arping` binaries:

```
Defaults:oracle !requiretty
oracle ALL=NOPASSWD: /sbin/ifconfig,/sbin/arping
```

17.3.6 Configure Server Migration Targets

In this section, server migration targets are configured. Configuring Cluster Migration sets the `DataSourceForAutomaticMigration` property to true.

To configure migration in a cluster:

1. Log in to the Oracle WebLogic Server Administration Console at: `http://ADMIN.mycompany.com/console`.
2. In the Domain Structure window, expand Environment and select Clusters. The Summary of Clusters page is displayed.
3. Click the cluster needed to configure migration (oim_cluster) in the Name column of the table.
4. Click the **Migration** tab.
5. Click **Lock and Edit**.
6. In the Candidate Machines for Migratetable Servers field, select the machine to which to allow migration and click the right arrow. In this case, select *`IDM_PROVISIONED_HOST`* and *`IDM_SCALED_OUT_HOST`*.
7. Select the data source to be used for automatic migration. In this case, select the leasing data source.
8. Click **Save**.
9. In the Domain Structure window of the Oracle WebLogic Server Administration Console, expand Environment and select Servers.
10. Select the server needed to configure migration.
11. Click the **Migration** tab.
12. Select **Automatic Server Migration Enabled** and click **Save**.
13. Click **Activate Changes**.
14. Repeat steps 2 to 13 for the SOA cluster.
15. Restart WebLogic Administration Server, Node Managers, and the servers for which server migration has been configured, as described in Start and Stop Components (page 10-26).

If migration is only going to be allowed to specific machines, do not specify candidates for the cluster, but rather specify candidates only on a server per server basis.

17.3.7 Test the Server Migration

In this section, the server migration is tested. Perform these steps to verify that server migration is working properly:

To test from *IDM_PROVISIONED_HOST*:

1. Stop the *WLS_OIM_PROVISIONED_HOST* Managed Server. To do this, run this command:

   ```
   kill -9 pid
   ```

   where *pid* specifies the process ID of the Managed Server. The pid can be identified in the node by running this command:

   ```
   ps -ef | grep WLS_OIM_PROVISIONED_HOST
   ```

2. Watch the Node Manager console. A message indicating that WLS_*OIM_PROVISIONED_HOST*'s floating IP has been disabled should be displayed.
3. Wait for Node Manager to try a second restart of *WLS_OIM_PROVISIONED_HOST*. It waits for a fence period of 30 seconds before trying this restart.
4. Once Node Manager restarts the server, stop it again. Node Manager should now log a message indicating that the server will not be restarted again locally.

To test from *IDM_SCALED_OUT_HOST*:

1. Watch the local Node Manager console. After 30 seconds since the last try to restart *WLS_OIM_PROVISIONED_HOST* on *IDM_PROVISIONED_HOST*, Node Manager on *IDM_SCALED_OUT_HOST* should prompt that the floating IP for *WLS_OIM_PROVISIONED_HOST* is being brought up and that the server is being restarted in this node.
2. Access the OIM Console using the Virtual Host Name, for example: OIMVH1. Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27).

Follow the previous steps to test server migration for the *WLS_OIM_SCALED_OUT_HOST*, *WLS_SOA_PROVISIONED_HOST*, and *WLS_SOA_SCALED_OUT_HOST* Managed Servers.

Table 17-2 (page 17-50) shows the Managed Servers and the hosts they migrate to in case of a failure.

Table 17-2 Managed Server Migration

Managed Server	Migrated From	Migrated To
WLS_OIM_PROVISIONED_HOST	*IDM_PROVISIONED_HOST*	*IDM_SCALED_OUT_HOST*
WLS_OIM_SCALED_OUT_HOST	*IDM_SCALED_OUT_HOST*	*IDM_PROVISIONED_HOST*
WLS_SOA_PROVISIONED_HOST	*IDM_PROVISIONED_HOST*	*IDM_SCALED_OUT_HOST*
WLS_SOA_SCALED_OUT_HOST	*IDM_SCALED_OUT_HOST*	*IDM_PROVISIONED_HOST*

Verification From the Administration Console

Migration can also be verified in the Administration Console:

1. Log in to the Administration Console. Console URLs are provided in About Oracle Identity Management Console URLs (page 10-27).
2. Click **IDMDomain** on the left console.

3. Click the **Monitoring** tab and then the **Migration** sub tab.

   The Migration Status table provides information on the status of the migration.

After a server is migrated, to fail it back to its original node/machine, stop the Managed Server from the Oracle WebLogic Administration Console and then start it again. The appropriate Node Manager starts the Managed Server on the machine to which it was originally assigned.

17.3.8 Back Up the Server Migration Configuration

Back up the database and the WebLogic domain, as described in Perform Backups During Installation and Configuration (page 10-28).

17.4 Set Up Fail Over for the Administration Server

This section discusses how to fail over the Administration Server to IDMHOST2 and how to fail it back to IDMHOST1.

This section contains the following topics:

- Fail Over the Administration Server to IDMHOST2 (page 17-51)
- Start the Administration Server on IDMHOST2 (page 17-53)
- Validate Access to IDMHOST2 Through Oracle HTTP Server (page 17-53)
- Fail the Administration Server Back to IDMHOST1 (page 17-54)

17.4.1 Fail Over the Administration Server to IDMHOST2

If a node fails, the Administration Server can be failed over to another node. This section describes how to fail over the Administration Server from IDMHOST1 to IDMHOST2.

Assumptions:

- The Administration Server is configured to listen on `ADMINVHN.mycompany.com`, and not on `ANY` address.
- The Administration Server is failed over from IDMHOST1 to IDMHOST2, and the two nodes have these IP addresses:
  - IDMHOST1: `100.200.140.165`
  - IDMHOST2: `100.200.140.205`
  - ADMINVIP: `100.200.140.206`

    This is the Virtual IP address where the Administration Server is running, assigned to *interface*:*index* (for example, eth1:2), available in IDMHOST1 and IDMHOST2.
- The domain directory where the Administration Server is running in IDMHOST1 is on a shared storage and is mounted also from IDMHOST2.

  NM in IDMHOST2 does not control the domain at this point, since `unpack`/`nmEnroll` has not been run yet on IDMHOST2. But for the purpose of AdminServer failover and control of the AdminServer itself, Node Manager is fully functional

- Oracle WebLogic Server and Oracle Fusion Middleware Components have been installed inIDMHOST2 as described in previous sections. That is, the same path for *IDM_ORACLE_HOME* and *MW_HOME* that exists in IDMHOST1 is available in IDMHOST2.

The following procedure shows how to fail over the Administration Server to a different node, IDMHOST2.

Step 1 and Step 2 are applicable ONLY for Linux.

1. Stop the Administration Server as described in Start and Stop Components (page 10-26).
2. Migrate the IP address to the second node.
   a. Run the following command as root on IDMHOST1 (where *x*:*y* is the current interface used by `ADMINVHN.mycompany.com`):

      Linux:

      ```
      /sbin/ifconfig x:y down
      ```

      For example:

      ```
      /sbin/ifconfig eth0:1 down
      ```

      Solaris:

      ```
      /sbin/ifconfig x:y down
      ```

      For example:

      ```
      /sbin/ifconfig eth0:1 down
      ```

   b. Run the following command on IDMHOST2:

      Linux:

      ```
      /sbin/ifconfig interface:index IP_Address netmask netmask
      ```

      For example:

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

      Solaris:

      ```
      /sbin/ifconfig interface:index IP_Address netmask netmask
      ```

      For example:

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

   Ensure that the netmask and interface to be used match the available network configuration in IDMHOST2.
3. Update routing tables by using the following commands, for example:

   Linux:

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

   Solaris:

   ```
   /usr/sbin/ping <ipaddress>
   ```

17.4.2 Start the Administration Server on IDMHOST2

Perform the following steps to start Node Manager on IDMHOST2.

1. On IDMHOST2, mount the Administration Server domain directory if it is not already mounted. For example:

   ```
   mount /u01/oracle
   ```

2. Start Node Manager by using the following commands:

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

3. Stop the Node Manager by killing the Node Manager process.

   Starting and stopping Node Manager at this point is only necessary the first time Node Manager is run. Starting and stopping it creates a property file from a predefined template. The next step adds properties to that property file.

4. Run the setNMProps.sh script to set the `StartScriptEnabled` property to `true` before starting Node Manager:

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

   Use the `StartScriptEnabled` property to avoid class loading failures and other problems.

5. Start the Node Manager as described in Starting and Stopping Components (page 10-26).

6. Start the Administration Server on IDMHOST2.

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

   Once in the WLST shell, execute the following commands:

   ```
   nmConnect('admin','Admin_Password', 'IDMHOST2','5556', 'IDMDomain','/u1/
   oracle/config/domains/IDMDomain')
   nmStart('AdminServer')
   ```

7. Test the access to the Administration Server on IDMHOST2 as follows:

   a. Ensure the access to the Oracle WebLogic Server Administration Console at:

      `http://ADMINVHN.mycompany.com:7001/console.`

   b. Check that it is possible to access and verify the status of components in the Oracle Enterprise Manager at: `http://ADMINVHN.mycompany.com:7001/em`.

17.4.3 Validate Access to IDMHOST2 Through Oracle HTTP Server

Perform the same steps as in Validate the Administration Server (page 10-24). This is to check that the Administration Server can be accessed when it is running on IDMHOST2.

17.4.4 Fail the Administration Server Back to IDMHOST1

This step checks that the Administration Server can be failed back, that is, it can be stopped on IDMHOST2 and run on IDMHOST1. To do this, migrate ADMINVHN back to IDMHOST1 node as described in the following steps.

1. Ensure that the Administration Server is not running. If it is, stop it from the WebLogic console, or by running the command `stopWeblogic.sh` from *`ASERVER_HOME`*`/bin`.
2. On IDMHOST2, unmount the Administration server domain directory. For example:

   ```
   umount /u01/oracle
   ```
3. On IDMHOST1, mount the Administration server domain directory. For example:

   ```
   mount /u01/oracle
   ```
4. Disable the `ADMINVHN.mycompany.com` virtual IP address on IDMHOST2 and run the following command as `root` on IDMHOST2:

   ```
   /sbin/ifconfig x:y down
   ```

   where *`x:y`* is the current interface used by `ADMINVHN.mycompany.com`.
5. Run the following command on IDMHOST1:

   ```
   /sbin/ifconfig interface:index 100.200.140.206 netmask 255.255.255.0
   ```

   Ensure that the netmask and interface to be used match the available network configuration in IDMHOST1
6. Update routing tables by using arping. Run the following command from IDMHOST1.

   ```
   /sbin/arping -q -U -c 3 -I interface 100.200.140.206
   ```
7. If Node Manager is not already started on IDMHOST1, start it, as described in Start and Stop Components (page 10-26).
8. Start the Administration Server again on IDMHOST1.

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

   Once in the WLST shell, execute

   ```
   nmConnect(admin,'Admin_Pasword, IDMHOST1,'5556',
        'IDMDomain','/u01/oracle/config/domains/IDMDomain'
   nmStart('AdminServer')
   ```
9. Test the access to the Oracle WebLogic Server Administration Console at:

   ```
   http://ADMINVHN.mycompany.com:7001/console
   ```

   where `7001` is *`WLS_ADMIN_PORT`*
10. Check it is possible to access and verify the status of components in the Oracle Enterprise Manager at:

    ```
    http://ADMINVHN.mycompany.com:7001/em
    ```

17.5 Next Steps

For more information regarding scale out and server migration for Oracle Fusion Applications, go to Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1). Otherwise, go to the section that corresponds to the product offering that is installed.

18

Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications

This section describes the conditional common high availability post-installation tasks for Oracle Fusion Applications that must be reviewed and completed as required. This section contains the following topics:

- Introduction to Completing Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1)
- Scale Oracle Fusion Applications (page 18-1)
- Set Up Server Migration for Oracle Fusion Applications (page 18-91)
- What to Do Next (page 18-98)

18.1 Introduction to Completing Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications

After successfully completing the conditional common post-installation tasks review and perform the following conditional common high availability tasks.

Some components in the Oracle Fusion Applications environment are dependent on one another. Therefore, it is important to start and stop components in the proper order. In the course of normal IT operations, common operations include shutting down computers and starting them back up. Therefore, it is crucial to start and stop Oracle Fusion Applications in a sequential manner. See Start and Stop an Oracle Fusion Applications Environment in the *Oracle Fusion Applications Administrator's Guide*.

18.2 Scale Oracle Fusion Applications

The Oracle Fusion Applications topology is highly scalable, and can be scaled up or out. When scaling up the topology, add a new Managed Server to provisioning hosts that are already running one or more Managed Servers. When scaling out the topology, add one or more instances of Managed Servers to new hosts.

18.2.1 Scale Out Oracle HTTP Server

The first Oracle HTTP Server (*WEBH0ST1*) was configured during the provisioning process. This section describes how to scale out Oracle HTTP Server to additional hosts.

18.2.1.1 Prerequisites for Performing the Scale Out

Before scaling out Oracle HTTP Server to additional hosts, ensure the following is done:

1. Reboot *WEBHOST2* to start the scaleout where *WEBHOST2* is a clean machine.

   MANDATORY: *WEBHOST2* and *WEBHOST1* should be running the same version of the operating system certified for Oracle Fusion Applications as other provisioning hosts.

2. On *WEBHOST2*, create the directory *REPOSITORY_LOCATION*/installers with the same user that installed Oracle HTTP Server on *WEBHOST1*.

3. Copy or ftp the entire content of the following directories from installers and jdk to *WEBHOST2*. Depending on network access available to *WEBHOST2*, it is possible to copy or ftp from *REPOSITORY_LOCATION* or *WEBHOST1*:

   - *REPOSITORY_LOCATION*/installers/webgate
   - *REPOSITORY_LOCATION*/installers/webtier
   - *REPOSITORY_LOCATION*/jdk

18.2.1.2 Install the Oracle Web Tier

To install Oracle Web Tier, do the following:

1. Run the following command to install Oracle Web Tier on *WEBHOST2*:

   UNIX:

   REPOSITORY_LOCATION/installers/webtier/Disk1/runInstaller

   The Oracle Fusion Middleware 11*g* Oracle Web Tier Utilities Configuration Welcome screen opens.

2. (UNIX only) Specify the same values for inventory directory and operating system group as those set for *WEBHOST1*. (These values can be found in the /etc/oraInst.loc file specified for *WEBHOST1*.)

   Click **OK**.

3. (UNIX only) Follow the instructions in the Inventory Location Confirmation Dialog box to execute the createCentralInventory.sh script as root user, and then click **OK** to dismiss the dialog box.

4. Select the appropriate options, and then click **Next** to start the installation.

   The Select Installation Type screen opens.

5. Select **Install Software - Do Not Configure** and click **Next**.

   The Prerequisite Checks screen opens.

   After all prerequisite checks have successfully completed, click **Next**. The Specify Installation Location screen opens. (If any prerequisite check fails, first resolve the issue, and then click **Retry** to run the prerequisite checks again.)

   Select the path to Oracle Middleware Home and enter a name for the home directory. For example, (UNIX) /u01/oracle/products/webtier_mwhome/. Click **Next**.

6. In the Specify Security Updates screen, do the following:
   - Enter an email address
   - Indicate to receive security updates from My Oracle Support
   - Enter the My Oracle Support password

   Click **Next**. The Installation Summary screen opens.
7. Click **Install**. The Installation Progress screen opens.

   Click **Next** when the installation has finished. The Installation Complete screen opens.

   Click **Finish**.
8. Review the directory structure that has been created:

   ```
   cd APPLICATIONS_BASE/webtier_mwhome
   ```

18.2.1.3 Install Oracle Web Tier Patches

If any directory under *REPOSITORY_LOCATION*/installers/webtier/prepatch and/or *REPOSITORY_LOCATION*/installers/webtier/patch exists, perform the steps in this section. If no directory exists, perform only Steps 1 (page 18-3) and 3 (page 18-3) on both *WEBHOST1* and *WEBHOST2* (skip Step 2).

To install Web Tier patches, do the following:

1. Set or change the environment variable $*ORACLE_HOME* to *APPLICATIONS_BASE*/webtier_mwhome/webtier/, as shown in the following examples:

   UNIX:

   ```
   export ORACLE_HOME=APPLICATIONS_BASE/webtier_mwhome/webtier
   ```
2. To install the patches:
   a. If a subfolder exists in the prepatch folder of the Web Tier installer, change directory to the prepatch folder and run the following command:

      ```
      ORACLE_HOME/OPatch/opatch napply
      ```
   b. Change directory to the patch folder and run the command again.
3. Make sure the same patches are installed on both *WEBHOST1* and *WEBHOST2* by running the following command on both *WEBHOST1* and *WEBHOST2*, comparing the output to ensure the patches are the same:

   ```
   APPLICATIONS_BASE/webtier_mwhome/webtier/OPatch/opatch lsinventory
   ```

18.2.1.4 Configure Oracle Web Tier

To configure Oracle Web Tier, do the following:

1. Begin configuring the Oracle Web Tier components:

   UNIX:

   ```
   cd APPLICATIONS_BASE/webtier_mwhome/webtier/bin
   run ./config.sh
   ```

The Oracle Fusion Middleware 11*g* Oracle Web Tier Utilities Configuration Welcome screen opens.

Click **Next**. The Configure Components screen opens.

2. Select **Oracle HTTP Server** and **Associate Selected Components with WebLogic Domain**.
3. Click **Next**. The Specify WebLogic Domain screen opens.
4. Enter the following:
   - Common domain host name; for example, *PROVISIONED_HOST*
   - Common domain port number; for example, `COMMONDOMAIN ADMIN PORT`
   - Common domain Administration Server user name
   - Common domain Administration Server password

   Associate Oracle HTTP Server with the CommonDomain that Provisioning installed.
5. Click **Next**. The Specify Component Details screen opens.
6. Do the following:
   - Select the instance home location; for example, `APPLICATIONS_CONFIG/CommonDomain_webtier1`
   - Enter the instance name; for example, `CommonDomain_webtier1`
   - Enter the Oracle HTTP Server component name; for example `ohs2`
7. Click **Next**. The Configure Ports screen opens.

   Copy the `staticports.ini` file from `repository/installers/webtier/Disk1/stage/Response` to *ORACLE_BASE*`/staticports.ini`.
8. Select **Specify Ports using Configuration file** and click **View/Edit**.

   In the text field that displays enter `OHS port = 10601` (or whichever OHS Port was used on *PROVISIONED_HOST* during Provisioning).

   Click **Save** and then click **Next**.

   The Specify Security Updates screen opens.
9. Do the following:
   - Enter an email address
   - Indicate to receive security updates from My Oracle Support
   - Enter the My Oracle Support password
10. Click **Next**. The Installation Summary screen opens.
11. Click **Configure** to install the configuration. The Configuration Progress screen opens.
12. Click **Next**.

    When the installation completes, the Installation Complete screen opens.
13. Click **Finish**.
14. Copy or `ftp` the `FusionVirtualHost` files from *WEBHOST1* to *WEBHOST2*:

WEBHOST1> *APPLICATIONS_CONFIG*/CommonDomain_webtier/config/OHS/ohs1/moduleconf

to

WEBHOST2> *APPLICATIONS_CONFIG*/CommonDomain_webtier1/config/OHS/ohs2/moduleconf/

15. Copy or ftp the FusionSSL.conf file from *WEBHOST1* to *WEBHOST2*:

    WEBHOST1> *ORACLE_BASE*/config/CommonDomain_webtier/config/OHS/ohs1

    to

    WEBHOST2> *ORACLE_BASE*/config/CommonDomain_webtier1/config/OHS/ohs2

16. After the copy is complete, replace all occurrences of *WEBHOST1* with *WEBHOST2* in all of the files with names ending in .conf that were copied to *WEBHOST2*.

17. Start the Oracle HTTP Server instance:

    UNIX:

    WEBHOST2> cd *APPLICATIONS_CONFIG*/CommonDomain_webtier1/bin
    WEBHOST2> ./opmnctl startall

    If an error message is displayed saying that the FusionSSL.conf file is missing, copy the file from *APPLICATIONS_CONFIG*/CommonDomain_webtier/config/OHS/ohs1 on *WEBHOST1* to the *APPLICATIONS_CONFIG*/CommonDomain_webtier1/config/OHS/ohs2 folder on *WEBHOST2*.

18.2.1.5 Install WebGate

To install WebGate on *WEBHOST2*, do the following:

1. From *REPOSITORY_LOCATION*/installers/webgate/Disk1, start the WebGate installation:

   UNIX:

   ./runInstaller -jreLoc *REPOSITORY_LOCATION*/jdk

2. When the Welcome screen opens, click **Next**. The Prerequisite Checks screen opens.

3. When the checking process completes, click **Next**. The Installation Location screen opens.

4. Enter an Oracle Middleware Home location Oracle Home Directory, *APPLICATIONS_BASE*/webtier_mwhome, and click **Next**. The GCC Library Details screen opens.

5. Enter an Oracle Middleware Home location Oracle Home Directory, *APPLICATIONS_BASE*/webtier_mwhome, and click **Next**. The Installation Summary screen opens.

6. Click **Save** to save the response file. Click **Install** to start the installation. Following an interim screen, the Installation Progress screen opens.

   During installation, a progress screen opens.

7. When the installation finishes, click **Next**. The Installation Complete screen opens.

8. Click **Save** to save the installation details. Click **Finish** to complete the WebGate installation.

18.2.1.6 Install WebGate Patches

If any directory under *REPOSITORY_LOCATION*/installers/webgate/prepatch and/or *REPOSITORY_LOCATION*/installers/webgate/patch exists, perform the steps in this section. If no directory exists, perform only Steps 1 (page 18-3) and 3 (page 18-3) on both *WEBHOST1* and *WEBHOST2* (skip Step 2).

To install WebGate patches, do the following:

1. Set or change the environment variable $*ORACLE_HOME* to *APPLICATIONS_BASE*/webtier_mwhome/webgate/, as shown in the following examples:

   UNIX:

   ```
   export ORACLE_HOME=APPLICATIONS_BASE/webtier_mwhome/webgate
   ```

2. To install the patches:

   a. If a subfolder exists in the prepatch folder of the WebGate installer, change directory to the prepatch folder and run the following command:

      ```
      ORACLE_HOME/OPatch/opatch napply
      ```

   b. Change directory to the patch folder and run the command again.

3. Make sure the same patches are installed on both *WEBHOST1* and *WEBHOST2* by running the following command on both hosts:

   ```
   APPLICATIONS_BASE/webtier_mwhome/webgate/OPatch/opatch lsinventory
   ```

18.2.1.7 Configure WebGate

After installing WebGate, do the following:

1. (UNIX) Append environment variable LD_LIBRARY_PATH with the Web Tier library path *APPLICATIONS_BASE*/webtier_mwhome/webtier/lib.

   UNIX:

   ```
   WEBHOST2> export LD_LIBRARY_PATH=APPLICATIONS_BASE/webtier_mwhome/
   webtier/lib:$LD_LIBRARY_PATH
   ```

2. Run the commands that follow.

   UNIX:

   ```
   # Usage: deployWebGateInstance.sh -w <WebGate_instancedir> -oh
   WebGate_Oracle_Home

   $  cd APPLICATIONS_BASE/webtier_mwhome/webgate/webgate/ohs/tools/
   deployWebGate

   $ ./deployWebGateInstance.sh -w APPLICATIONS_CONFIG/CommonDomain_webtier1/
   config/OHS/ohs2 -oh APPLICATIONS_BASE/webtier_mwhome/webgate

   $  cd APPLICATIONS_BASE/webtier_mwhome/webgate/webgate/ohs/tools/setup/
   InstallTools
   ```

```
$ ./EditHttpConf -w APPLICATIONS_CONFIG/CommonDomain_webtier1/config/OHS/
ohs2 -oh APPLICATIONS_BASE/webtier_mwhome/webgate -o webgate.conf
```

3. Do the following on *WEBHOST1*:

   a. From *APPLICATIONS_CONFIG*/CommonDomain_webtier/config/OHS/ohs1/webgate/config, copy the following to *APPLICATIONS_CONFIG*/CommonDomain_webtier1/config/OHS/ohs2/webgate/config on *WEBHOST2*:

   ```
   "ObAccessClient.xml","cwallet.sso","password.xml"
   ```

   b. From *APPLICATIONS_CONFIG*/CommonDomain_webtier/config/OHS/ohs1/webgate/config/simple, copy the following to *APPLICATIONS_CONFIG*/CommonDomain_webtier1/config/OHS/ohs2/webgate/config/simple on *WEBHOST2*:

   ```
   "aaa_key.pem","aaa_cert.pem"
   ```

4. Restart Oracle HTTP Server:

   UNIX:

   ```
   WEBHOST2> cd APPLICATIONS_CONFIG/CommonDomain_webtier1/bin
   WEBHOST2> ./opmnctl stopall
   WEBHOST2> ./opmnctl startall
   ```

Oracle HTTP Server scaleout is now complete, and *WEBHOST1* and *WEBHOST2* should behave identically.

18.2.1.8 Validate Oracle HTTP Server on WEBHOST2

To validate after the installation is complete:

1. Check that it is possible to access the Oracle HTTP Server home page on *WEBHOST1* and *WEBHOST2* using the following URLs:
   - `http://webhost1.mycompany.com:10601`
   - `http://webhost2.mycompany.com:10601`
2. Stop *WEBHOST1*:

   UNIX:

   ```
   WEBHOST1> cd APPLICATIONS_CONFIG/CommonDomain_webtier/bin
   WEBHOST1> ./opmnctl stopall
   ```

3. Access the following URLs to ensure that the WebLogic Administration console of applicable Oracle Fusion Applications domain is visible, and that Oracle HTTP Server on *WEBHOST2* is configured correctly:

   The host and port of these URLs come from the internal virtual hosts and ports listed in the Virtual Hosts Configuration screen of the Oracle Fusion Applications Provision Wizard. The URLs can be also found in the provisioning summary file. (For more information, see the Installation Complete row in Table 13-1 (page 13-6)). Having all of the domains depends on the provisioning offerings selected.

   - `http://crminternal.mycompany.com/console`
   - `http://fininternal.mycompany.com/console`
   - `http://hcminternal.mycompany.com/console`

- `http://scminternal.mycompany.com/console`
- `http://commoninternal.mycompany.com/console`
- `http://biinternal.mycompany.com/console`
- `http://icinternal.mycompany.com/console`
- `http://prjinternal.mycompany.com/console`
- `http://prcinternal.mycompany.com/console`

4. Access the following URLs to ensure that the WebLogic Administration console of applicable Oracle Fusion Applications domain is visible, and that Oracle HTTP Server on *`WEBHOST2`* is configured correctly:

   The host and port of these URLs come from the external virtual hosts and ports listed in the Virtual Hosts Configuration screen of the Oracle Fusion Applications Provision Wizard. Having all of the domains depends on the provisioning offerings selected.

   - `https://crmexternal.mycompany.com/sales/faces/mooOpportunityHome`
   - `https://crmexternal.mycompany.com/crmPerformance/faces/TerritoriesMain`
   - `https://crmexternal.mycompany.com/contractManagement/faces/ContractsDashboard`
   - `https://crmexternal.mycompany.com/customer/faces/CustomerCtrWorkarea`
   - `https://finexternal.mycompany.com/ledger/faces/LedgerWorkArea`
   - `https://finexternal.mycompany.com/payables/faces/PaymentLandingPage`
   - `https://prcexternal.mycompany.com/procurement/faces/PrcPoPurchasingWorkarea`
   - `https://prjexternal.mycompany.com/projectsFinancials/faces/PRJProjectWorkarea`
   - `https://commonexternal.mycompany.com/homePage/faces/AtkHomePageWelcome`
   - `https://biexternal.mycompany.com/analytics`
   - `https://icexternal.mycompany.com/incentiveCompensation/faces/IcCnCompPlanWorkarea`

5. Run the following commands:

   UNIX:

   ```
   WEBHOST1> cd APPLICATIONS_CONFIG/CommonDomain_webtier/bin
   WEBHOST1> ./opmnctl startall
   ```

18.2.2 Scale Out Node Manager

This section describes how to setup and configure Node Manager to a new host to be used as a scaled-out host.

18.2.2.1 Prerequisites for Setting Up Node Manager

Before setting up Node Manager, ensure the following:

- Start with a clean machine (denoted as SCALED_OUT_HOST), if it is the first time it is being set up.
- The UNIX `/etc/hosts` file has proper entries. To verify this from the clean machine, ping the hosts listed in `/etc/hosts` files with the fully qualified name of the hosts.
- The user created on *SCALED_OUT_HOST* to perform the scale out should be the same as the user on *PROVISIONED_HOST*.
- The directory structure *APPLICATIONS_BASE* is mounted on *SCALED_OUT_HOST* and it is the same shared file system as used by *PROVISIONED_HOST*.

  The Local domains directory on the *PROVISIONED_HOST* should not be mounted on *SCALED_OUT_HOST*.
- The directory structure *APPLICATIONS_CONFIG*`/nodemanager` on *SCALED_OUT_HOST* has been created.
- Provisioning the initial Oracle Fusion Applications environment on *PROVISIONED_HOST* has already completed and verified.

18.2.2.2 Set Up Node Manager for SCALED_OUT_HOST

Do the following:

1. Run the following command:

   UNIX:

   SCALED_OUT_HOST`> cd` *APPLICATIONS_CONFIG*`/nodemanager`

2. In the `nodemanager` directory, copy the content of the node-specific directory to *SCALED_OUT_HOST*. In this case, *PROVISIONED_HOST* is the node-specific directory.

   UNIX:

   SCALED_OUT_HOST`> cp -r` *PROVISIONED_HOST SCALED_OUT_HOST*

3. Change directory to *SCALED_OUT_HOST*. The following files should be seen:

   ```
   nm_data.properties   nodemanager.log   startNodeManagerWrapper.sh
   nodemanager.domains  nodemanager.properties
   ```

   Manually delete any lock files that may be present. For example, `nodemanager.log.lck`.

4. In the `nodemanager.domains` file, edit all the domain paths that are local to *SCALED_OUT_HOST*. For example, *Domain*`=/u02/local/oracle/config/domains/`*SCALED_OUT_HOST*`/`*domain_name*.

   In this section, replace *domain_name* with the domain-specific syntax. For example, *CRMDomain*, *FINDomain*, *HCMDomain*, and so on.

   Because the Oracle Business Intelligence domain is a bit different, an example path would be `BIDomain=/u02/local/oracle/config/domains/`*PROVISIONED_HOST*`/BIDomain`.

5. (UNIX only) In the `startNodeManagerWrapper.sh` file, change `NM_HOME` to *`APPLICATIONS_CONFIG`*`/nodemanager/`*`SCALED_OUT_HOST`*.
6. In the `nodemanager.properties` file:
   - Add or modify the following lines:

     ```
     KeyStores=CustomIdentityAndCustomTrust
     CustomIdentityKeyStoreFileName=APPLICATIONS_CONFIG/keystores/
     SCALED_OUT_HOST_fusion_identity.jks
     CustomIdentityPrivateKeyPassPhrase=keypassword
     CustomIdentityAlias=SCALED_OUT_HOST_fusion
     ```

     keypassword is the password given in the provisioning response file for the Oracle Fusion Applications Administration user.

     Since the passwords in the response and plan files are encrypted, take note of or save the Node Manager password entered when creating the provisioning response file.
   - Ensure that the path to the local machine `/u02/local/oracle/nodemanager/` exists, and that the `LogFile` value is pointing to `/u02/local/oracle/nodemanager/`*`SCALED_OUT_HOST`*`.log`.
   - Ensure that the path for `DomainsFile` and `NodeManagerHome` are correct for *`SCALED_OUT_HOST`*.

18.2.2.3 Create the Identity Keystore on SCALED_OUT_HOST

Provisioning has created the identity keystore *`PROVISIONED_HOST`*`_fusion_identity.jks` for *`PROVISIONED_HOST`*. Subsequently, the identity keystore *`SCALED_OUT_HOST`*`_fusion_identity.jks` must be created for *`SCALED_OUT_HOST`*.

Do the following to create the keystore:

1. Change directory to *`APPLICATIONS_CONFIG`*`/keystores`.

   Ensure the *`PROVISIONED_HOST`*`_fusion_identity.jks` and `fusion_trust.jks` files are present.
2. Back up `fusion_trust.jks` to `fusion_trust.jks.org`.
3. Run the following command to set the CLASSPATH:

   UNIX:

   ```
   SCALED_OUT_HOST> source APPLICATIONS_BASE/fusionapps/wlserver_10.3/server/
   bin/setWLSEnv.sh
   ```

   Ensure that the CLASSPATH has been set:

   ```
   SCALED_OUT_HOST> which keytool
   ```

   Ensure that the CLASSPATH has been set:

   ```
   SCALED_OUT_HOST> where keytool
   ```

   The output should point to the *`APPLICATIONS_BASE`*`/fusionapps/jdk/jre/bin/keytool`.

4. Run the following command to create the keypair for *SCALED_OUT_HOST*_fusion_identity.jks.

   ```
   SCALED_OUT_HOST> keytool -genkeypair -keyalg RSA
   -alias SCALED_OUT_HOST_fusion -keypass
   keypassword -keystore SCALED_OUT_HOST_fusion_identity.jks
   -storepass keystorepassword
   -validity 180 -dname 'CN=SCALED_OUT_HOST, OU=defaultOrganizationUnit,
   O=defaultOrganization, C=US'
   ```

   where

   - *keystorepassword* is the password given in the *APPLICATIONS_BASE*/provisioning/plan/provisioning.plan file
   - *keypassword* is the password given in the *APPLICATIONS_BASE*/provisioning/plan/provisioning.plan file

   It is recommended to keep the commands in a file and then execute it.

   Since the passwords in the response and plan files are encrypted, take note of or save the Node Manager password entered when creating the provisioning response file.

5. Run the following command to export the certificates:

   UNIX:

   ```
   SCALED_OUT_HOST> keytool -exportcert -alias SCALED_OUT_HOST_fusion
   -keystore SCALED_OUT_HOST_fusion_identity.jks
   -storepass keystorepassword -rfc -file /tmp/appIdentityKeyStore.jks
   ```

   If the alias *SCALED_OUT_HOST*_fusion exists, run this command to delete it:

   ```
   keytool -delete -alias SCALED_OUT_HOST_fusion
   -keystore fusion_trust.jks -storepass keystorepassword
   ```

   The following command will display the certificates in the trust keystore:

   ```
   keytool -list -keystore fusion_trust.jks -storepass
   keystorepassword
   ```

6. Run the following command to import the certificates:

   UNIX:

   ```
   SCALED_OUT_HOST> keytool -importcert -noprompt -alias
   SCALED_OUT_HOST_fusion -file /tmp/appIdentityKeyStore.jks
   -keystore fusion_trust.jks -storepass keystorepassword
   ```

7. Verify that the file *SCALED_OUT_HOST*_fusion_identity.jks has been created in the directory *APPLICATIONS_CONFIG*/keystores directory.

8. Start Node Manager on *SCALED_OUT_HOST*.

   UNIX:

   ```
   APPLICATIONS_CONFIG/nodemanager/SCALED_OUT_HOST/
   startNodeManagerWrapper.sh &
   ```

   The & in the command runs the script in the background.

9. Verify that Node Manager is up and running.

   UNIX:

```
netstat -a | grep 5556
```

18.2.3 Perform Scale-Out Tasks Common to All Domains

There are the scale-out tasks that are common to all Oracle Fusion Applications Managed Servers in all domains (Common, Oracle Fusion CRM, Oracle Fusion Financials, Oracle Fusion Human Capital Management, Oracle Fusion Incentive Compensation, Oracle Fusion Project Portfolio Management, Oracle Fusion Procurement, and Oracle Fusion Supply Chain Management) except Oracle Business Intelligence. These tasks are the following:

- Starting *SCALED_OUT_HOST* Node Manager in SSL mode
- Adding a new machine in the Oracle WebLogic Server console
- Packing and unpacking the Managed Server domain home
- Cloning Managed Servers and assigning them to SCALED_OUT_HOST
- Configuring Oracle HTTP Server
- Configuring server migration for the Managed Servers
- Validating the system

For specific information about scaling the Oracle Business Intelligence domain, see Scale Out the Oracle Business Intelligence Domain (page 18-35).

18.2.3.1 Start SCALED_OUT_HOST Node Manager in SSL Mode

To start Node Manager in the Secure Sockets Layer (SSL) mode, follow the instructions in Scale Out Node Manager (page 18-8).

18.2.3.2 Add a New Machine In the Oracle WebLogic Server Console

To add a new machine:

1. Stop the domain's Administration Server.

   UNIX:

   ```
   PROVISIONED_HOST> APPLICATIONS_CONFIG/domains/PROVISIONED_HOST/
   domain_name/bin/stopWebLogic.sh
   ```

2. Set the following environment variable on *SCALED_OUT_HOST*.

   UNIX:

   ```
   export WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=
   APPLICATIONS_CONFIG/keystores/fusion_trust.jks"
   ```

3. Start the domain's Administration Server.

   UNIX:

   ```
   SCALED_OUT_HOST> APPLICATIONS_BASE/fusionapps/wlserver_10.3/common/bin/
   wlst.sh
   SCALED_OUT_HOST> nmConnect(username='username', password='password',
   domainName='domain_name', host='PROVISIONED_HOST',port='5556',
   nmType='ssl', domainDir='APPLICATIONS_CONFIG/domains/
   PROVISIONED_HOST/domain_name')
   ```

```
SCALED_OUT_HOST> nmStart('AdminServer')
SCALED_OUT_HOST> exit ()
```

The *username* and *password* used in the `nmConnect` are the Node Manager credentials (user name and password) specified when creating the provisioning response file.

4. Log in to the Administration Server: `http://domain`internal.mycompany.com/console.
5. Navigate to ***Domain_Name***, **Environment**, **Machines**.

   LocalMachine is located in the right-hand pane.
6. In the left-hand pane, click **Lock & Edit**.
7. In the right-hand pane, first click **New** to add the remote machine, and then specify the following:
   - Name - enter *SCALED_OUT_HOST*
   - Machine operating system - in UNIX: Unix
8. Click **Next**.
9. In the window that opens, set the following attributes:
   - Type - SSL
   - Listen Address - <*SCALED_OUT_HOST*>

     The "localhost" default value here is wrong.
   - Listen port - 5556
10. Click **Finish** and activate the changes.

18.2.3.3 Pack and Unpack the Managed Server Domain Home to SCALED_OUT_HOST

Since the *PROVISIONED_HOST* domain directory file system is also available from *SCALED_OUT_HOST*, both the `pack` and `unpack` commands can be executed from *SCALED_OUT_HOST*.

To pack and unpack the Managed Server domain home:

1. Change directory to *APPLICATIONS_BASE*`/fusionapps/oracle_common/common/bin`.
2. Run the `pack` command:

   UNIX:

   ```
   SCALED_OUT_HOST> ./pack.sh -managed=true -domain=APPLICATIONS_CONFIG/
   domains/PROVISIONED_HOST/domain_name -template=APPLICATIONS_BASE/
   user_templates/domain_name_managed.jar -template_name="
   domain_name_Managed_Server_Domain"
   ```
3. Ensure that *APPLICATIONS_LOCAL_CONFIG* `/domains/`*SCALED_OUT_HOST*`/`*domain_name* is empty, and then run the `unpack` command:

   UNIX:

```
SCALED_OUT_HOST> ./unpack.sh -domain=APPLICATIONS_LOCAL_CONFIG/domains/
SCALED_OUT_HOST/domain_name -template=APPLICATIONS_BASE_/user_templates/
domain_name_managed.jar
```

In these commands, *APPLICATIONS_LOCAL_CONFIG* is local to *SCALED_OUT_HOST*.

18.2.3.4 Clone Managed Servers and Assign Them to SCALED_OUT_HOST

The following naming conventions are used in the procedure that follows:

- *ManagedServerName*_1 is the name of the Managed Server to be cloned.
- *ClonedManagedServer* is the name given to the Managed Server that is being cloned. For consistency, its name should follow the same naming convention as *ManagedServerName*, in this format: *ClonedManagedServer_n*, where *n* is a number starting with 2, and is incremented when multiple instances are cloned. For example, *ClonedManagedServer*_3, *ClonedManagedServer*_4, and so on.

To add a Managed Server and assign it to *SCALED_OUT_HOST*:

1. Log in to the Administration Server: `http://domain_nameinternal.mycompany.com/console`.

   (*domain_name* is the domain containing the Managed Server that is being cloned).
2. Navigate to ***Domain_Name***, **Environment**, **Servers**.
3. Switch to **Lock & Edit** mode.
4. Select the ***ManagedServerName*_1** check box and then click **Clone**.
5. Specify the following Server Identity attributes:
   - Server Name - *ClonedServerName* _2

     To ensure consistency in naming, copy the name of the server shown in **Server Identity** and paste it into the **Server Name** field. Then change the number to "_2".
   - Server Listen Address - <*SCALED_OUT_HOST*>
   - Server Listen Port - leave "as is"
6. Click **OK**.

   The newly cloned server should now be seen, *ClonedServerName* _2.
7. Click ***ClonedServerName*_2** and change the following attributes:
   - Machine - <*SCALED_OUT_HOST*>
   - Cluster Name - accept the default, *ClonedServerName*Cluster

     Ensure that this cluster name is the same as the cluster name of the original Managed Server.
8. Click **Save** and then **Activate Changes**.
9. Navigate to ***Domain_Name***, **Environment**, **Servers**.
10. From the **Name** column, click the ***ClonedServerName*_2** scaled-out server link.
11. Click **Lock & Edit**, and then select the **Configuration** tab.
12. Select the **Keystores** tab, and ensure that the keystores value is **Custom Identity and Custom Trust**.

13. Do the following:
    a. Change the Custom Identity Keystore path to point to the *APPLICATIONS_CONFIG*/keystores/*SCALED_OUT_HOST*_fusion_identity.jks file.
    b. Leave the Custom Identity Keystore type blank.
    c. Change the Custom Identity Keystore Passphrase entry. This should be the same as the *keystorepassword*, which is the password given in the APPLICATIONS_BASE/provisioning/plan/provisioning.plan file.
    d. Re-enter the Confirm Custom Identity Keystore Passphrase.
    e. Ensure that the Confirm Custom Trust Keystore path is pointing to the *APPLICATIONS_CONFIG*/keystores/fusion_trust.jks file.
    f. Leave the Custom Trust Keystore type blank.
    g. Change the Custom Trust Keystore Passphrase entry. This should be the same as the *keystorepassword*, which is the password given in the APPLICATIONS_BASE/provisioning/plan/provisioning.plan file.
    h. Re-enter the Custom Trust Keystore Passphrase.
    i. Click **Save**.
14. Select the **SSL** tab.
    a. Make sure that Identity and Trust Locations is set to **Keystores**.
    b. Change the Private Key Alias to *SCALED_OUT_HOST*_fusion.
    c. Change the Private Key Passphrase to the *keypassword*, which is the password given in the APPLICATIONS_BASE/provisioning/plan/provisioning.plan file.
    d. Re-enter the *keypassword* from Step 13.c (page 18-15) for the Confirm Private Key Passphrase.
    e. Click **Save**.
15. Select the **Server Start** tab.

    Change the Arguments to reflect the name of the cloned Managed Server and make sure the server group is the correct cluster name. For example, the following should be seen:

    ```
    -DJDBCProgramName=DS/domain_name/ClonedServerName_2
    -Dserver.group=ClonedServerNameCluster
    ```

    Click **Save**.
16. Select the **Logging** tab, and then select the **HTTP** tab.
17. Do the following:
    a. Change the Log file name to logs/access.log.%yyyyMMdd%.
    b. Change the rotation type to **By Time**.
    c. Leave the **Limit number of retained files** option unchecked.
    d. Leave the **Rotate log file on startup** option unchecked.
    e. Click **Save**.
    f. Expand **Advanced**.

g. Change the format to **Extended**.

h. Change the extended logging format fields to the following:

```
date time time-taken cs-method cs-uri
sc-status sc(X-ORACLE-DMS-ECID)
cs(ECID-Context) cs(Proxy-Remote-User)
cs(Proxy-Client-IP)
```

i. Click **Save**.

18. Click **Activate Changes**.

19. Repeat Steps 2 (page 18-14) to 18 (page 18-16) for all the Managed Servers on this domain.

20. Run the newly created Managed Servers:

a. Log in to the Administration Server: `http://domain_nameinternal.mycompany.com/console`.

b. Navigate to ***Domain_Name***,**Environment**, **Servers**, **Control**.

c. Select the newly created Managed Servers and click **Start**.

d. Navigate to ***Domain_Name***, **Environment**, **Servers** and check the **State** to verify that the newly created Managed Servers are running.

18.2.3.5 Configure Oracle HTTP Server

To configure Oracle HTTP Server:

1. Do the following:

- On *WEBHOST1*, change directory to *APPLICATIONS_CONFIG*`/CommonDomain_webtier/config/OHS/ohs1/moduleconf`
- On *WEBHOST2*, change directory to *APPLICATIONS_CONFIG*`/CommonDomain_webtier1/config/OHS/ohs2/moduleconf`

2. Copy `FusionVirtualHost_`*domain*`.conf` to `FusionVirtualHost_`*domain*`.conf.org`.

where *domain* is replaced with the syntax of the specific product domain.

The following table shows how the `FusionVirtualHost` configuration file names map to each domain.

Table 18-1 FusionVirtualHost Configuration File-to-Domain Mapping

Domain	File Name
Oracle Fusion Common	`FusionVirtualHost_fs.conf`
Oracle Business Intelligence	`FusionVirtualHost_bi.conf`
Oracle Fusion Customer Relationship Management	`FusionVirtualHost_crm.conf`
Oracle Fusion Financials	`FusionVirtualHost_fin.conf`
Oracle Fusion Human Capital Management	`FusionVirtualHost_hcm.conf`
Oracle Fusion Incentive Compensation	`FusionVirtualHost_ic.conf`

Table 18-1 (Cont.) FusionVirtualHost Configuration File-to-Domain Mapping

Domain	File Name
Oracle Fusion Procurement	`FusionVirtualHost_prc.conf` `FusionVirtualHost_prc.supplierportal.conf`
Oracle Fusion Project Portfolio Management	`FusionVirtualHost_prj.conf`
Oracle Fusion Supply Chain Management	`FusionVirtualHost_scm.conf`

3. Edit the `FusionVirtualHost_`*`domain`*`.conf` file, adding the scaled-out host and port to all the WebLogic Application Clusters. Add this to both the Internal and External part of the `FusionVirtualHost_`*`domain`*`.conf` file. The example shows sample code for *ManagedServer*.
   - Do not add these values for Oracle Enterprise Manager, Oracle WebLogic Server Administration Console, or Oracle Authorization Policy Manager.
   - If the Managed Servers are running on VIPs, replace *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`* with the VIP addresses shown in the example code.
4. Repeat Step 3 (page 18-17) for all applications.
5. Do the following to restart Oracle HTTP Server:

   On *`WEBHOST1`*:
   - Change directory to *`APPLICATIONS_CONFIG`*`/CommonDomain_webtier/bin`
   - Enter the following:

     UNIX:

     ```
     WEBHOST1> ./opmnctl stopall
     WEBHOST1> ./opmnctl startall
     ```

   On *`WEBHOST2`*:
   - Change directory to *`APPLICATIONS_CONFIG`*`/CommonDomain_webtier1/bin`
   - Enter the following:

     UNIX:

     ```
     WEBHOST2> ./opmnctl stopall
     WEBHOST2> ./opmnctl startall
     ```

Example 18-1 Sample "ManagedServer" Code

```
<Location /managedServer>
    SetHandler weblogic-handler
    WebLogicCluster <PROVISIONED_HOST:port>,<SCALED_OUT_HOST:port>
</Location>
```

18.2.3.6 Configure Server Migration for the Managed Servers

Server migration is required for proper failover of Oracle Fusion Applications components in the event of failure in any of the *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`* nodes. See Set Up Server Migration for Oracle Fusion Applications (page 18-91).

18.2.3.7 Validate the System

Verify URLs to ensure that the appropriate routing and failover are working.

To verify the URLs:

1. Log in to the domain's Oracle WebLogic Server Administration Console and stop all the Managed Servers on *PROVISIONED_HOST* while the Managed Servers on *SCALED_OUT_HOST* are running.
2. Before cloning a Managed Server, do the following:
   a. Log in to Oracle Fusion Applications with the correct user ID.
   b. Select the appropriate menu to access the application provisioned to that managed server.
   c. Copy the URL by keeping the portion/segment of `https://host[:port]/ApplicationName/faces/NameOfWebPage`.

   The following URLs are examples of Managed Servers in various domains:

   - `https://crmexternal.mycompany.com/contractManagement/faces/ContractsDashboard`
   - `https://finexternal.mycompany.com/ledger/faces/JournalEntryPage`
   - `https://finexternal.mycompany.com/payables/faces/InvoiceWorkbench`
   - `https://finexternal.mycompany.com/receivables/faces/ReceiptsWorkArea`
   - `https://finexternal.mycompany.com/receivables/faces/TransactionsWorkArea`
   - `https://commonexternal.mycompany.com/helpPortal/faces/AtkHelpPortalMain`
   - `https://commonexternal.mycompany.com/homePage/faces/AtkHomePageWelcome`
   - `https://hcmexternal.mycompany.com/hcmCore/faces/AddPersonUiShellMainPage`
   - `https://hcmexternal.mycompany.com/hcmCore/faces/PersonSearch`
   - `https://scmexternal.mycompany.com/productManagement/faces/ItemDashboard`
   - `https://scmexternal.mycompany.com/costManagement/faces/ItemCostProfileWorkarea`
   - `https://icexternal.mycompany.com/incentiveCompensation/faces/IcCnCompPlanWorkarea`
   - `https://prjexternal.mycompany.com/projectsFinancials/faces/PRJProjectWorkarea`
   - `https://prjexternal.mycompany.com/projectsFinancials/faces/PrjCostWorkArea`
3. Verify that routing and failover are functioning properly. (Ensure the log in prompt is visible.)

4. Log in to the domain's Oracle WebLogic Server Administration Console and stop all the Managed Servers on *SCALED_OUT_HOST*.
5. Start the Managed Servers on *PROVISIONED_HOST*.
6. Repeat Step 2 (page 18-18). (Ensure the log in prompt is visible.)
7. Start all the Managed Servers on *SCALED_OUT_HOST* and verify that they are running on *PROVISIONED_HOST* and *SCALED_OUT_HOST*.

18.2.4 Perform Scale-Out Tasks Specific to the Oracle Fusion Customer Relationship Management Domain

In addition to the scale-out tasks found in Perform Scale-Out Tasks Common to All Domains (page 18-12), perform the following task to scale out the Oracle Fusion CRM Data Quality feature.

18.2.4.1 Configure Data Quality for Scale Out

Data Quality is an Informatica tool that provides the following:

- A *matching* function, which allows to search, match, and identify duplicate customer records based on key customer attributes such as name, address, date of birth, Social Security Number, or tax ID number. It also includes data quality connector, a generalized interface that can make real-time and batch requests to an external data-cleansing engine.
- An *address-cleansing* feature, which corrects and validates address data based on postal requirements.

Implementing Data Quality requires four steps:

1. Obtaining postal reference data and license keys.
2. Setting up the Data Quality Engine, also known as Informatica Identity Resolution (IIR).
3. Configuring Data Quality Connector and IIR in Oracle Fusion Functional Setup Manager.
4. Creating a second Data Quality server on *CRMHOST2*.

18.2.4.1.1 Obtain Postal Reference Data and License Keys

Before configuring data quality for scale out, obtain postal reference data and license key files from AddressDoctor. For information about how to obtain these, see the licensing documentation.

18.2.4.1.2 Set Up the Data Quality Engine

To set up the data quality engine:

1. On *CRMHOST1*, change directory to *APPLICATIONS_BASE*/InformaticaIR/bin.
2. Run the following commands:

```
CRMHOST1> source setfusionEnv.sh
CRMHOST1> ./liup
CRMHOST1> ./idsup
```

3. Start the following:

   ```
   ./idsconc -a
   ```

4. On the launched console, select **Rulebase Type=SSA** and **Alias=rtunitrb** and click **OK**. Then click **Yes** to create a new rulebase.
5. In the IIR console, navigate to **System** , **New**, **Create a system from SDF**.
6. Enter the following system information:
   - **System Name** - `FusionDQRealtime`
   - **System Definition File** - *APPLICATIONS_BASE*`/InformaticaIR/ids/FusionDQRealtime.sdf`
   - **DB Type** - `SSA`
   - **Alias** - `fusion_s01`
7. Click **OK**, and then click **Close** to dismiss the Create/System window.
8. Navigate to **System menu**, **Select**, **System Name: FusionDQRealtime** and click **OK**.
9. Navigate to **System menu**, **Load IDT** to start loading the individual IDT tables, one by one, until the following IDTs are completed:

   ```
   load_location
   load_organization
   load_org_address
   load_person
   load_per_address
   load_per_phone
   ```

10. Close the IIR Console started in Step 2 and run the following commands to stop the IIR server:

    ```
    CRMHOST1> APPLICATIONS_BASE/InformaticaIR/bin/idsdown
    CRMHOST1> APPLICATIONS_BASE/InformaticaIR/bin/lidown
    ```

11. Assuming the postal reference data and license key files have been received from AddressDoctor (requested in Obtaining Postal Reference Data and License Keys (page 18-19)), run the following commands:

    ```
    CRMHOST1> cd APPLICATIONS_BASE/InformaticaIR/ssaas/ad5/ad/db
    CRMHOST1> cp mylocation/key .
    CRMHOST1> cp mylocation/*.MD .
    ```

    mylocation is the directory where the license key and the postal reference data were copied.

    `*.MD` is the postal data reference file. `key` is a text file that contains the AddressDoctor license.

    AddressDoctor supports 248 countries. Each `*.MD` file is per country or a group of countries. Each of these files should be copied to the `*.MD` directory.

12. Run the following commands to start the IIR server:

    ```
    CRMHOST1> APPLICATIONS_BASE/InformaticaIR/bin/liup
    CRMHOST1> APPLICATIONS_BASE/InformaticaIR/bin/idsup
    ```

13. From the IIR Console, do the following to start the UPD Synchronizer:
    a. Run the following command:

```
CRMHOST1> APPLICATIONS_BASE/InformaticaIR/bin/idsconc -a
```

b. On the launched console, select **Rulebase Type=SSA** and **Alias=rtunitrb**, and click **OK** to go the RuleBase.

c. In the IIR console, go to **System, Select** and select **FusionDQRealtime**.

d. Go to **Tools**, **Synchronizer**, **Run Synchronizer** and click **OK** to accept all the defaults shown in the Update Synchronizer popup window.

Ensure that the **IDT Name=(all)** option is selected.

18.2.4.1.3 Configure the Data Quality Connector and IIR

To configure the data quality connector and IIR:

1. Log in to Oracle Fusion Functional Setup Manager as an administrator. For example, `http://commoninternal.mycompany.com/homePage/faces/AtkHomePageWelcome`.
2. Click **Navigator**, then **Setup and Maintenance**.
3. Select the **All tasks** tab.
4. Select **Input Name= manage server** and then click **Search**.

   The Manage Server Configurations task displays.
5. Click **Go to Task** to open the Manage Data Quality Server Configurations page, and then click **Search** to find all existing configurations.
6. Select **Realtime and Batch Basic Server** and do the following:

   a. Click **Edit**.

   b. Enter the server IP address and port of the IIR search server set up as the IIR matching server.

      For the server IP address, enter the *CRMHOST1* IP address. Enter the default port number, `1666`. Since the port number can be different than the default port number, run the following command to confirm that the correct one is used:

      ```
      grep SSA_SEPORT= APPLICATIONS_BASE/InformaticaIR/env/isss
      ```

   c. Select **Enable Matching**.

   d. Click **Save and Close**.
7. From the Manage Data Quality Server Configurations page, select **Realtime Cleanse Server** and do the following:

   a. Click **Edit**.

   b. Enter the server IP address and port of the IIR search server set up as the IIR matching server.

      For the server IP address, enter the *CRMHOST1* IP address. Enter the default port number, `1666`. Since the port number can be different than the default port number, run the following command to confirm that the correct one is used:

      ```
      grep SSA_SEPORT= APPLICATIONS_BASE/InformaticaIR/env/isss
      ```

   c. Select **Enable Cleansing**.

   d. Click **Save and Close**.

8. From the Manage Data Quality Server Configurations page, select **Batch Cleanse Server** and repeat Steps 7.a (page 18-21) through 7.d (page 18-21) from Step 7 (page 18-21).
9. Search for the task *Manage Data Synchronization* and click **Go to Task**.
10. From **Actions** dropdown list, select **Refresh Identity Table Information** to refresh the IDT repository information.
11. Select **Enable for Sync** for each IDT and click **Save**.
12. Click **Schedule Synchronization Process** and then **Advanced**.
13. Select **Using a schedule**.
14. Select **Hourly/Minute** from the **Frequency** dropdown list. (This frequency should be determined by the business requirement.)
15. Enter *every 5 minutes* for this example. (This *every 5 minutes* sample should be determined by the business requirement.)
16. Select a "next few days" end date from the calender. (This *few days* sample should be determined by the business requirement.)
17. Click **Submit** to schedule the Sync ESS job.
18. Do the following to validate that Data Quality is up and running:
    a. Ensure that the Customer Center application is running.
    b. In Customer Center, create a unique organization and then try to create that same organization again.

       If Data Quality is working correctly, a popup window will display telling that this organization cannot be created because it already exists.

18.2.4.1.4 Create a Second Data Quality Server on CRMHOST2

To create a second data quality server:

1. Run the following command:

   ```
   CRMHOST2> cd REPOSITORY_LOCATION/installers/iir/fusion_iir
   ```

2. Edit the `install.props` file to include the following values:

   ```
   ##############################################
   # USE ABSOLUTE PATHS FOR ALL
   ##############################################
   # These environment variables are required to be set for
   # IIR to be able to use the ORACLE DB CLIENT
   ##############################################
   ORACLE_HOME=APPLICATIONS_BASE/dbclient
   TNS_ADMIN=APPLICATIONS_CONFIG/ess/tnsadmin
   LD_LIBRARY_PATH=APPLICATIONS_BASE/dbclient/lib
   ##############################################
   # These properties are required to be set for
   # IIR to be installed in the right directory
   ##############################################
   FUSION_STAGE_DIR=REPOSITORY_LOCATION/installers/iir
   IIR_STAGE_DIR=REPOSITORY_LOCATION/installers/iir
   IIR_VERSION=IIR_901sp1_linux_amd64
   IIR_TOP=APPLICATIONS_BASE/IIR2
   ##############################################
   ```

```
# These properties are required to be set for IIR to be
# able to connect to the Oracle DB to install Schema Objects
################################################
IIR_DB_HOSTNAME=FUSIONDBHOST1-VIP
IIR_DB_PORT=1521
IIR_DB_SID=FADB1
IIR_DB_USER=fusion_dq
IIR_DB_PASSWD=PASSWORD
################################################
# ALL THESE PROPERTIES ARE NEEDED BY THE INSTALLER
# DO NOT MODIFY THESE UNLESS NECESSARY
################################################
IIR_INSTALL_LOG_LOC=REPOSITORY_LOCATION/installers/iir/fusion_iir
IIR_INSTALL_TYPE=all
IIR_INCLUDE_DOC=yes
################################################
# Default is one Server Instance
################################################
IIR_INSTANCE_1_PORT=1601
################################################
# Not Implemented yet
################################################
IIR_INSTANCE_2_PORT=
################################################
# This option is needed for Search to be accessible through a Browser
################################################
IIR_HTTP=Y
################################################
# This is for Installing the IIR Control and Sync Objects ( needed only for
the #first time)
################################################
INSTALL_IIR_OBJECTS=N
################################################
# This is needed for OEM Key
################################################
SSALI_MZXPQRS=STANISLAUS
```

3. Run the following command:

   ```
   ./runInstaller.sh install.props > test_console
   ```

   The installation is now complete.

4. Configure the data quality connector and IIR:

   a. Log in to Oracle Fusion Functional Setup Manager as an administrator. For example, `http://commoninternal.mycompany.com/homePage/faces/AtkHomePageWelcome`.

   b. Click **Navigator**, then **Setup and Maintenance**.

   c. Select the **All tasks** tab.

   d. Select **Input Name= manage server** and then click **Search**.

      The Manage Server Configurations task displays.

   e. Click **Go to Task** to open the Manage Data Quality Server Configurations page, and then click **Search** to find all existing configurations.

   f. Select **Realtime and Batch Basic Server** and do the following:

      i. Click **Edit**.

ii. Enter the server IP address and port of the IIR search server set up as the IIR matching server.

For the server IP address, enter the *CRMHOST1* IP address. Enter the default port number, 1666. Since the port number can be different than the default port number, run the following command to confirm that the correct one is used:

```
grep SSA_SEPORT= APPLICATIONS_BASE/InformaticaIR/env/isss
```

iii. Select **Enable Matching**.

iv. Click **Save and Close**.

g. Update the **SecondaryServer1Address** and **SecondaryServer1Port** values respectively for the host name and port of the Secondary Server *CRMHOST2*. These parameters can be found in the **Server Parameter Values** section.

h. Select **Enable High Availability** for each server configuration.

i. Click **Save and Close**.

5. Restart IIR on *CRMHOST1* and *CRMHOST2*.

On *CRMHOST1*:

```
CRMHOST1> cd APPLICATIONS_BASE/InformaticaIR/bin
CRMHOST1> source setfusionEnv.sh
CRMHOST1> . ../env/isss
CRMHOST1> ./idsdown
CRMHOST1> ./idsup
```

On *CRMHOST2*:

```
CRMHOST2> cd APPLICATIONS_BASE/IIR2/InformaticaIR/bin
CRMHOST2> source setfusionEnv.sh
CRMHOST2> . ../env/isss
CRMHOST2> ./idsdown
CRMHOST2> ./idsup
```

The following is sample output of the idsdown command:

```
bash-3.2$ ./idsdown
Mon Jun 24 11:48:48 2013 idsdown: shutting down idscssv on localhost:1669
Mon Jun 24 11:48:48 2013 idsdown: shutting down idscosv on localhost:1667
Mon Jun 24 11:48:48 2013 idsdown: shutting down idssesv on localhost:1666
Mon Jun 24 11:48:48 2013 idsdown: shutting down idsxmsv on localhost:1670
Mon Jun 24 11:48:48 2013 idsdown: shutting down idshtsv on localhost:1671
Mon Jun 24 11:48:48 2013 idsdown: shutting down idsrbsv on localhost:1668
```

6. Restart the Oracle Fusion Applications instances (which require DQ) so that the DQ Connector can do load balancing and failover.

18.2.5 Perform Scale-Out Tasks Specific to the Common Domain

In addition to the scale-out tasks found in Perform Scale-Out Tasks Common to All Domains (page 18-12), do also the following for the Oracle Fusion Common domain:

- Perform one additional step when cloning Managed Servers
- Remove Oracle Coherence start-up properties from the wlcs_server1 server
- Configure shared content folders for the UCM_server1 server

- Add a `sip` data-tier channel to the `wlcs_sipstate2` server
- Unpack the `UCM_server2` server
- Configure the Oracle WebCenter product suite
- Scale out Oracle WebCenter Content inbound refinery server
- Add the `UCM_server1` and `UCM_server2` servers to the connection pool

18.2.5.1 Clone Managed Servers and Assign Them to SCALED_OUT_HOST

To add a Managed Server to the Common domain, do the following:

1. Follow the steps in Clone Managed Servers and Assign Them to SCALED_OUT_HOST (page 18-14).
2. Ensure that the `UCM_server2` Managed Server is functioning properly. Access and log in to the following:
   - `http://`*`SCALED_OUT_HOST`*`:7012/cs`
   - `http://`*`SCALED_OUT_HOST`*`:7012/ibr`

18.2.5.2 Remove Oracle Coherence Start-up Properties from the wlcs_server1 Server

Remove Oracle Coherence startup properties from the `wlcs_server1` Managed Server's **Startup** tab before scaling out the `wlcs_server2` Manager Server.

Although the provisioning process adds Oracle Coherence startup properties to the `wlcs_server1` Managed Server, Oracle Coherence is not configured and is not currently used in Oracle Fusion Applications on-premise deployments.

To remove the startup properties:

1. Log in to the Oracle WebLogic Server Administration Console (`http://commoninternal.mycompany.com/console`).
2. In the Domain Structure window, expand the **Environment** node.
3. Click **Servers**.

   The Summary of Servers page appears.
4. Select **wlcs_server1** (represented as a hyperlink) from the column of the table.

   The Settings page appears.
5. Click **Lock & Edit**.
6. Click the **Server Start** tab.
7. Remove the following Oracle Coherence properties from the Arguments field:

   ```
   -DUCS.coherence.localhost=PROVISIONED_HOST
   -DUCS.coherence.localport=7061
   -DUCS.coherence.wka1.port=7061
   -DUCS.coherence.wka1=PROVISIONED_HOST
   ```
8. Click **Save** and **Activate Changes**.
9. Navigate to **CommonDomain**, **Environment**, **Servers** and select the **Control** tab.

10. Select the `wlcs_server1` Managed Server in the table, click **Shutdown**, and then select the **Force Shutdown Now** option from dropdown list.
11. Start the `wlcs_server1` Managed Server.

18.2.5.3 Configure Shared Content Folders for the UCM_server1 Server

To configure shared content folders for the `UCM_server1` server, do the following:

1. Create a *`COMMONUCMLBRVH`* Transmission Control Protocol (TCP) VIP with port 6300 on the load-balancing router (LBR) with *`PROVISIONED_HOST`* `:7034` and *`SCALED_OUT_HOST`*`:7034` as its members.

   Because Oracle WebCenter Content failover works only with TCP connections, ensure to use TCP, and **not** Hypertext Transfer Protocol (HTTP), in the LBR setup.
2. Shut down the `UCM_server1` Managed Server:
   a. Log in to the Oracle WebLogic Server Administration Console (`http://commoninternal.mycompany.com/console`).
   b. In the Domain Structure window, first navigate to **Environment**, then **Servers**, and then click **Control**.
   c. Select **UCM_server1**.
   d. Click **Shutdown** and then **Force Shutdown Now**.
3. In the `/u02/local/oracle/config/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs/bin/intradoc.cfg` file on *`PROVISIONED_HOST`* , create the variables `IntradocDir`, `vaultDir`, and `weblayoutDir` if they do not already exist, and point them to the shared location: *`ORACLE_BASE`*`/config/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs`.
4. Copy the *`PROVISIONED_HOST`* `/u02/local/oracle/config/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs` directory from the local to the shared location, *`ORACLE_BASE`*`/config/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs`.
5. In the `config` file on *`PROVISIONED_HOST`* (*`ORACLE_BASE`*`/config/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs/config/config.cfg`), edit two existing properties with the following:

   ```
   SocketHostNameSecurityFilter=localhost|localhost.localdomain|
   localhost6|localhost6.localdomain6|WEBHOST1|PROVISIONED_HOST|WEBHOST2|
   SCALED_OUT_HOST|COMMONUCMLBRVH
   ```

   and

   ```
   IdcCommandServerHost=127.0.0.1
   ```
6. Start the `UCM_server1` Managed Server.
7. Ensure that the `UCM_server1` Managed Server is functioning properly. It should be possible to access and log in to the following:
   - `http://`*`PROVISIONED_HOST`*`:7012/cs`
   - `http://`*`PROVISIONED_HOST`*`:7012/ibr`

18.2.5.4 Add a sip Data-Tier Channel to the wlcs_sipstate2 Server

Unless a `sip` data-tier channel is added, the `wlcs_sipstate2` server start-up fails with the following error:

```
There are no sip nor diameter channels targeted to server "wlcs_sipstate2"
```

Therefore, do the following for the `wlcs_sipstate2` scaled-out server only:

1. Change directory to:

   APPLICATIONS_CONFIG`/domains/`*PROVISIONED_HOST*`/CommonDomain/config/custom`

2. After the following line in the `datatier.xml` file:

   ```
   <server-name>wlcs_sipstate1</server-name>
   ```

   add

   ```
   <server-name>wlcs_sipstate2</server-name>
   ```

18.2.5.5 Unpack the UCM_server2 Server

To provision the `UCM_server2` server cluster with a shared configuration, copy the *APPLICATIONS_CONFIG*`/domains/`*PROVISIONED_HOST*`/CommonDomain/ucm` folder structure, including files, to `/u02/local/oracle/config/domains/`*SCALED_OUT_HOST*`/CommonDomain` for the `UCM_Server2` local configuration.

18.2.5.6 Configure Oracle WebCenter

This section describes the additional steps to complete the Oracle WebCenter product suite scale out.

This section tells how to do the following:

- Configure the Oracle WebCenter Portal `wc_spaces` and `wc_spaces 2` servers
- Configure persistence stores for JMS servers
- Configure a default persistence store for transaction recovery
- Set the listen address for the `IPM_server1` and `IPM_server2` servers
- Add `IPM_server1` and `IPM_server2` VIP addresses to the list of allowed hosts
- Add the `UCM_server1` and `UCM_server2` servers to the connection pool

18.2.5.6.1 Configure the Oracle WebCenter Portal wc_spaces and wc_spaces2 Servers

After scaling out the Oracle WebCenter Portal Managed Server, do the following:

1. Log in to: `http://commoninternal.mycompany.com/em`.
2. Navigate to **Farm_CommonDomain**, **WebCenter**, **Portal, Spaces**, **WebCenter Portal (11.1.*) (WC_Spaces)**, **WebCenter Portal (top left of right pane)**, **Settings**, **Service configuration**.

   Click **Content Repository**.

3. Highlight **FusionAppsContentRepository** and click **Edit**.

4. Select **Socket** and enter *COMMONUCMLBRVH* as the host and the LBR port for the server.
5. If updating the first instance of `wc_spaces` did not automatically update the second instance, repeat Step 2 (page 18-27) through Step 4 (page 18-28) for `wc_spaces2`.
6. Restart the Oracle WebCenter Portal `wc_spaces` and `wc_spaces2` Managed Servers.

Verifying the Location of FusionAppsContentRepository

When configuring Oracle WebCenter Content Server, the `FusionAppsContentRepository` content repository should move from the file system to the Fusion database. To verify the move of the repository to the database, upload the `/etc/hosts` file on *PROVISIONED_HOST* to WebCenter Content Server by running the following commands, in order:

UNIX:

```
export RIDC_JAR=<APPLICATIONS_BASE>/fusionapps/ecm/ucm/Distribution/FAProv/
oracle.ucm.fa_client_11.1.1.jar

export UCMSCRIPT_JAR=/u01/oracle/products/fusionapps/ecm/ucm/Distribution/
FAProv/ucmscript.jar

$ java -cp $UCMSCRIPT_JAR:$RIDC_JAR oracle.ucm.client.UploadTool
--url=idc://PROVISIONED_HOST:7034 --username=admin_username
--uploadFile=/etc/hosts --dSecurityGroup=public --dDocTitle=hosts
--Tool.AccountRequired=false
--quiet
```

- In the `java -cp` command, the Intradoc protocol is being used in the URL option `--url=idc://`, and not `http`.
- Get the IntradocServerPort number `7034` used in the URL above from the `config` file:

  UNIX:

  ```
  /u02/local/oracle/config/domains/PROVISIONED_HOST/CommonDomain/ucm/cs/
  config/config.cfg
  ```

- After the UNIX `/etc/hosts` file successfully uploads to the Fusion database, something similar to the following displays:

  ```
  Upload successful.
  [dID=1 | dDocName=UCMFA000001]
  ```

  Use the `dID` number in the next SQL command.

UNIX:

```
$ sqlplus FUSION_OCSERVER11G/fusionDB_password

SQL> select dID, dRenditionID, dFileSize, DLastModified
from FileStorage where dID=1;
SQL>
```

The following is sample output from the SQL command:

```
DID     DRENDITIONID         DFILESIZE     DLASTMODIFIED
1       primaryFile          702           21-MAY-13 12.16.03.524000 PM
1       webViewableFile      702           21-MAY-13 12.16.03.687000 PM
```

18.2.5.6.2 Configure Persistence Stores for JMS Servers

Set the location for all persistence stores targeted to the `IPM_server1` and `IPM_server2` Managed Servers to a directory that is visible from both *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`*.

To configure the persistence stores:

1. Log in to the Oracle WebLogic Server Administration Console (`http://commoninternal.mycompany.com/console`).
2. Click **Lock & Edit**.
3. In the Domain Structure window, expand the **Services** node and then click the **Persistence Stores** node.

   The Summary of Persistent Stores page displays.
4. Click **New**, and then select the **Create File Store** option from dropdown list.
5. Enter the following directory information:
   - **Name**: For example, `IPMJMSFileStore1`
   - **Target**: `IPM_server1`
   - **Directory**: *`APPLICATIONS_CONFIG`*`/domains/`*`PROVISIONED_HOST`*`/CommonDomain`
6. Click **OK**.
7. Repeat Steps 3 (page 18-29) through 6 (page 18-29) to create the following persistence stores:
   - `ViewerJMSFileStore1`, targeting to `IPM_server1`
   - `ViewerJMSFileStore2`, targeting to `IPM_server2`
   - `IPMJMSFileStore2`, targeting to `IPM_server2`
8. Click **Activate Changes**.
9. Click **Lock & Edit**.
10. In the Domain Structure window, expand the **Services** node, then click the **Messaging**, then **JMS Servers node**.

    The Summary of JMS Servers page displays.
11. Click the name of the server, **IpmJmsServer1**.
12. From the **Configuration**, **General** tab, select **IPMJMSFileStore1** from the **Persistence Store** dropdown list.
13. Click **Save**.
14. Repeat Steps 10 (page 18-29) through 13 (page 18-29) for the JMS server **ViewerJmsServer1** using `ViewerJMSFileStore1`.
15. Click **Activate Changes**.
16. Click **Lock & Edit**.
17. In the Domain Structure window, expand the **Services** node and then click the **Messaging**, JMS Servers node.

The Summary of JMS Servers page displays.

18. Click **New**.
19. Enter a name (for example, `IpmJmsServer2`), then select **IPMJMSFileStore2** from the **Persistence Store** dropdown list.
20. Click **Next**.
21. Select **IPM_server2** as the target.
22. Click **Finish**.
23. Repeat Steps 17 (page 18-29) through 22 (page 18-30) to create the new JMS server **ViewerJmsServer2** using `ViewerJMSFileStore2` targeting the`IPM_server2` Managed Server.
24. Click **Activate Changes**.
25. Restart the `IPM_server1` and `IPM_server2` Managed Servers.

18.2.5.6.3 Configure a Default Persistence Store for Transaction Recovery

Each server has a transaction log which stores information about committed transactions that are coordinated by the server that may not have been completed. Oracle WebLogic Server uses this transaction log for recovery from system crashes or network failures. To leverage the migration capability of the Transaction Recovery Service for the servers within a cluster, store the transaction log in a location accessible to a server and its backup servers.

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:

1. Log in to the Oracle WebLogic Server Administration Console (`http://commoninternal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. In the Domain Structure window, expand the **Environment** node and then click the **Servers** node.

   The Summary of Servers page displays.
4. Click the name of the server (represented as a hyperlink) in the **IPM_server1** table. The settings page for the selected server opens with the **Configuration** tab active.
5. Open the **Services** tab.
6. In the Default Store section of the page, enter the path to the folder where the default persistent stores will store its data files. For example, create a directory

   PROVISIONED_HOST`> `*APPLICATIONS_CONFIG*`/domains/`*PROVISIONED_HOST*`/CommonDomain/tlogs`
7. Click **Save**.
8. Repeat Steps 1 (page 18-30) through 7 (page 18-30) for the `IPM_server2` Managed Server.
9. Click **Activate Changes**.

10. Restart the Managed Servers to activate the changes (ensure that Node Manager is up and running):
    a. Log in to the Oracle WebLogic Server Administration Console (`http://commoninternal.mycompany.com/console`).
    b. In the Summary of Servers screen, select the **Control** tab.
    c. Select **IPM_server1** and **IPM_server2** in the table and then click **Shutdown**.
    d. After the servers have shut down, select **IPM_server1** and **IPM_server2** in the table and click **Start**.

- 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 `IPM_server1` and `IPM_server2` must be able to access this directory.
- Ensure the following the path exists on the machine:

  (Linux) `/usr/share/X11/fonts/TTF`

  (Solaris) `/usr/X11/lib/X11/fonts/TrueType`

18.2.5.6.4 Set the Listen Address for IPM_server1 and IPM_server2

Ensure that virtual IPs have been enabled on *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`* before setting the `IPM_server1` and `IPM_server2` listen addresses.

To set the listen address for the Managed Servers:

1. Log in to the Administration Console (`http://commoninternal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. Expand the Environment node in the Domain Structure window.
4. Click **Servers**.

   The Summary of Servers page displays.
5. Select **IPM_server1** in the table.

   The Settings page for `IPM_server1` Managed Server displays.
6. Set the listen address to **COMMONIPMVH1** and click **Save**.
7. Navigate to the Summary of Servers page and select **IPM_server2** in the table.

   The Settings page for the `IPM_server2` Managed Server displays.
8. Set the listen address to **COMMONIPMVH2** and click **Save**.

   Both *`COMMONIPMVH1`* and *`COMMONIPMVH2`* are pingable.
9. Click **Activate Changes.**

   The changes will not take effect until the `IPM_server1` and `IPM_server2` Managed Servers are restarted. To restart the Managed Servers, do the following:
   a. Ensure that Node Manager is up and running.
   b. On the Summary of Servers page, select the **Control** tab.
   c. Navigate to the Summary of Servers page, select **IPM_server1** and**IPM_server2** in the table, and then click **Shutdown**.

d. After the servers have shut down, select **IPM_server1** and **IPM_server2** in the table and click **Start**.

18.2.5.6.5 Add IPM_server1 and IPM_server2 VIP Addresses to the List of Allowed Hosts

Perform these steps to add the `IPM_server1` and `IPM_server2` virtual-host names to the `SocketHostNameSecurityFilter` parameter list:

1. Edit the `config` file *`PROVISIONED_HOST`*: *`APPLICATIONS_LOCAL_CONFIG`*`/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/cs/config/config.cfg`, with the following:

   ```
   SocketHostNameSecurityFilter=localhost|localhost.localdomain|localhost6|
   localhost6.localdomain6|WEBHOST1|PROVISIONED_HOST|WEBHOST2|
   SCALED_OUT_HOST|COMMONUCMLBRVH|COMMONIPMVH1|COMMONIPMVH2
   ```

2. Restart the `UCM_server1` and `UCM_server2` Oracle WebCenter Content Management Servers for the changes to take effect.

18.2.5.7 Scale Out Oracle WebCenter Content Inbound Refinery Server

Follow the steps below to scale out the Oracle WebCenter Content Inbound Refinery (IBR) server. Note that IBR is provisioned only if the provisioning offering(s) selected needs it. Subsequently, the environment may not need IBR.

If *`APPLICATIONS_LOCAL_CONFIG`*`/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/ibr` is present on *`PROVISIONED_HOST`*, then IBR is provisioned in the environment.

1. Edit the *`APPLICAITONS_LOCAL_CONFIG`*`/domains/`*`PROVISIONED_HOST`*`/CommonDomain/ucm/ibr/config/config.cfg` file on *`PROVISIONED_HOST`* with the following:
   - `IDC_Name=`*`PROVISIONED_HOST`*`7012`
   - `InstanceMenuLabel=`*`PROVISIONED_HOST`*`7012`
   - `SocketHostNameSecurityFilter=localhost|localhost.localdomain|localhost6|localhost6.localdomain6|`*`PROVISIONED_HOST`*`|`*`SCALED_OUT_HOST`*
   - `HttpServerAddress=`*`PROVISIONED_HOST`*`:7012` (*`PROVISIONED_HOST`*'s server address instead of load balancer, as it is a singleton node.)
2. Add the following to the `config.cfg` file on both *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`*:

   ```
   EnableReserveDirectoryCheck=false
   ```

3. Restart the `ucm_server1` server.
4. Navigate to `http://`*`SCALED_OUT_HOST`*`:7012/ibr` (*`SCALED_OUT_HOST`*'s `ibr`) and log in when prompted.

   The post-installation configuration page displays, as it is not a clustered node.
5. On the post-installation configuration page:
   a. Set the server socket port to **7035**.
   b. Ensure the port has a unique server instance name and unique local paths on *`SCALED_OUT_HOST`*.
   c. Set the Incoming Socket Connection Address Security Filter:

```
SocketHostNameSecurityFilter=localhost|localhost.localdomain|
localhost6|localhost6.localdomain6|PROVISIONED_HOST|SCALED_OUT_HOST
```

d. Click **Submit**.

e. Restart the `ucm_server2` server.

6. Navigate to `http://PROVISIONED_HOST:7012/cs` and select **Administration > providers**.

   ibrprovider is already defined in this list.

7. Add a new outgoing provider:

   a. Click **Add**.

   b. Set the values to match the values of **ibrprovider**.

      MANDATORY: The value for the new outgoing ibrprovider must differ from the value of the default ibrprovider.

   c. Assign the following unique values: to Provider Name, Provider Description, Server Host Name, Server Port, Instance Name, and Relative Web Root.

      – Provider Name: `ibr_provider2`

      – Provider Description: ibrprovider for second server

      – Server Host Name: *SCALED_OUT_HOST*

      – Server Port: `7035`

      – Instance Name: *SCALED_OUT_HOST_HOST*`7012`

      – Relative Web Root: `/cs`

8. Navigate to Inbound Refinery on the second node: `http://SCALED_OUT_HOST:7012/ibr`.

9. (**UNIX** only) Select **Conversion Settings** and update the primary web rendition.

10. Navigate to **Third-Party Applications Settings**, **General OutsideIn Filter Options**, **Options** and set the following path to the fonts: `/usr/share/X11/fonts/TTF`.

    Solaris:

    Navigate to **Third-Party Applications Settings**, **General OutsideIn Filter Options**, **Options** and set the following path to the fonts: `/usr/X11/lib/X11/fonts/TrueType`.

    The font location can be specific to the operating system.

11. Restart the `UCM_server1` and `UCM_server2` Managed Servers.

18.2.5.8 Add UCM_server1 and UCM_server2 to the Connection Pool

To add `UCM_server1` and `UCM_server2` to the connection pool, do the following:

1. Log in to the Oracle WebCenter Content: Imaging application at: `https://commonexternal.mycompany.com/imaging`.

2. In the left-hand pane, expand **Manage Connections**.

3. Click the **Fusion Applications UCM Connection** link.

4. In the right-hand Fusion Applications UCM Connection: Connection Summary pane, click **Modify**.
5. In the Basic Information screen, click **Next**.
6. In the Connection Settings screen, add two servers to the Content Server pool:
   - *PROVISIONED_HOST*: 7034
   - *SCALED_OUT_HOST*: 7034
7. Click **Next**.
8. In the Connection Security screen, leave all four default selections for the **FUN_FINANCIAL_APPLICATION_ADMINISTRATOR_JOB** WebLogic user, and then click **Next**.
9. In the Review Settings screen, review the connection details and click **Submit**.

18.2.6 Configure Oracle Coherence for the odi_server Managed Server

Oracle Data Integrator Managed Servers are present in four domains:

- Oracle Fusion CRM
- Oracle Fusion HCM
- Oracle Fusion Human Capital Management
- Oracle Fusion Incentive Compensation

Oracle recommends using unicast communication in `odi_server` enterprise deployments, unless use of multicast is a must. Consider using multicast communication for large Oracle Data Integrator clusters with approximately 20 or more Oracle Data Integrator Managed Servers

WARNINIG: An incorrect configuration of the Oracle Coherence framework that is used for deployment may prevent the `odi_server` Managed Server from starting. Oracle recommends the configuration described in this section.

Unicast communication does not enable nodes to discover other cluster members automatically when a new Oracle Data Integrator server is added to a cluster. Consequently, specify the nodes that belong to the cluster. It is not necessary to specify all of the nodes of a cluster, however. Specify only enough nodes so that a new node added to the cluster can discover one of the existing nodes. Consequently, 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 Oracle Data Integrator enterprise deployments, where multiple IPs are available in the same box, configure Oracle Coherence to use a specific host name to create the Oracle Coherence cluster.

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

Specify the nodes using the `-Doracle.odi.coherence.wka n` system property, where *n* is the number for each Oracle HTTP Server. The numbering starts 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. 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.

To add the virtual-host names to Oracle Coherence:

1. Log in to the Oracle WebLogic Server Administration Console (`http://`*`domain_name`*`internal.mycompany.com/console`).
2. In the Domain Structure window, expand the **Environment** node.
3. Click **Servers**.

   The Summary of Servers page appears.
4. Select **odi_server1** (represented as a hyperlink) from the column of the table.

   The Settings page appears.
5. Click **Lock & Edit**.
6. Click the **Server Start** tab.
7. Change the existing properties if necessary, and enter new properties into the Arguments field:

   ```
   -Dtangosol.coherence.localport=9066
   -Dtangosol.coherence.localhost=PROVISIONED_HOST
   -Doracle.odi.coherence.wka1=PROVISIONED_HOST
   -Doracle.odi.coherence.wka1.port=9066
   -Doracle.odi.coherence.wka2=SCALED_OUT_HOST
   -Doracle.odi.coherence.wka2.port=9066
   -DJDBCProgramName=DS/domain_nameDomain/odi_server1
   -Dserver.group=ODICluster
   ```

   WARNING: There should be no breaks in lines between the different `-D` parameters. Do not copy or paste the code from above to the Administration Console's Arguments text field. This may result in HTML tags being inserted in the Java arguments. The code should not contain other characters than those included in the example above.
8. Click **Save** and **Activate Changes**.
9. Navigate to ***Domain_Name***, **Environment**, **Servers** and select the **Control** tab.
10. Select the `odi_server1` Managed Server in the table, click **Shutdown**, and then select the **Force Shutdown Now** option from dropdown list.
11. Start the `odi_server1` Managed Server.

18.2.7 Scale Out the Oracle Business Intelligence Domain

This section describes how to scale the Oracle Business Intelligence domain.

18.2.7.1 Overview of the Oracle Business Intelligence Domain

Oracle Fusion Applications offerings use following Oracle Business Intelligence components from the Oracle Business Intelligence domain:

- Oracle Business Intelligence Analytics
- Essbase
- Oracle Real-Time Decisions
- Oracle Business Intelligence Publisher
- Oracle Business Intelligence Publisher (Oracle BI Publisher)
- Oracle Transaction Business Intelligence

Oracle Essbase

Oracle Fusion General Ledger combines the traditional general ledger functionality with Oracle Essbase functionality, which is embedded seamlessly within Oracle Fusion General Ledger. At the time users create their chart of accounts, the balances cube is created automatically. Later, in case of a change such as a cost center is added or a date effective hierarchy is modified, the General Ledger automatically creates or modifies the corresponding balances cube hierarchy. As transactions or journals are posted, the General Ledger automatically updates the multidimensional cube. Unlike a data warehouse, no batch programs need to be run to populate the balances cube; it is all happening in real time when a journal is posted.

Oracle Business Intelligence Publisher

Oracle BI Publisher provides the ability to create and format high quality reports across Oracle Fusion Financials applications. It applies templates, which users design in familiar desktop tools, to standard extracts and reports. For example, it is used widely used in Oracle Fusion Payments for formatting of the check payments and electronic payment files.

Oracle Transaction Business Intelligence

Oracle Transaction Business Intelligence is widely used in Oracle Fusion Financials as a reporting tool. Using Oracle Transaction Business Intelligence, users can perform adhoc queries directly from transaction tables using drag-and-drop functionality to build custom reports in real time from the various Oracle Fusion Financials applications. It helps immensely in reducing the need to build and maintain customized reports.

Oracle Business Intelligence Analytics

Oracle Business Intelligence Analytics provides day-to -day key performance indicators (KPIs) of any item in Oracle Fusion Financials. Intelligence and analytics are embedded within the context of business transactions to help users complete the transitions. For example, before users post a journal, the system tells them the impact the journal has on the account balances. This eliminates the need to navigate to a separate page to run a query or run a report. End users are not distracted from the task at hand, reporting and process demand is reduced, and smarter decisions are made in the context of the transaction.

18.2.7.2 Prerequisites for Scaling the Oracle Business Intelligence Domain

Before beginning, ensure the following:

- Node Manager has been started in the Secure Sockets Layer (SSL) mode by following the instructions in Scaling Out Node Manager (page 18-8).

- The Administration Console's **Follow Configuration Changes** feature has been disabled (to eliminate redirections):
  1. Log into the Administration Console (`http://biinternal.mycompany.com/console`) and go to **Preferences**, **Shared Preferences**.
  2. Deselect **Follow Configuration Changes** and click **Save**.

18.2.7.3 Start the Default Node Manager

To start the default Node Manager:

1. Stop any Node Manager running on *`BIHOST2`* using one of the following methods:
   - Use Ctrl+C in the shell where it was started.
   - Use the standard process-identification and kill commands in the operating system appropriate to the specific product offering and the Oracle Fusion Applications enterprise deployment.
2. Change directory to *`APPLICATIONS_BASE`*`/fusionapps/wlserver_10.3/common/nodemanager` and edit the `nodemanager.properties` file with the following:

   ```
   SecureListener=false
   ```
3. Change directory to *`APPLICATIONS_BASE`*`/fusionapps/oracle_common/common/bin` and run the following script:

   UNIX:

   ```
   ./setNMProps.sh
   ```
4. Change directory to *`APPLICATIONS_BASE`*`/fusionapps/wlserver_10.3/server/bin` and run the following script:

   UNIX:

   ```
   ./startNodeManager.sh
   ```

   Node Manager starts on *`BIHOST2`*.

Steps 2 (page 18-37) through 4 (page 18-37) enable Node Manager on *`BIHOST2`* and the Administrator Console to communicate on Plain Socket.

18.2.7.4 Prerequisites for Scaling Oracle Business Intelligence on BIHOST2

Prerequisites include the following:

- Configuring a JMS file persistence store on *`BIHOST1`*
- Setting the listen address for the `bi_server1` server
- Updating the `FusionVirtualHost_bi.conf` configuration file

18.2.7.4.1 Configure a JMS File Persistence Store in BIHOST1

Configure the location for the Java Message Service (JMS) file persistence store to a directory visible from both nodes. Change the persistent store to use this shared base directory.

1. Log in to the Administration Console (`http://biinternal.mycompany.com/console`).

2. In the Domain Structure window, expand the **Services** node.
3. In the Change Center, click **Lock & Edit**.
4. Click the **Persistent Stores** node.

   The Summary of Persistent Stores page displays.
5. Click **JRFWSAsyncFileStore** and enter a directory that is located in the shared storage. This shared storage is accessible from both *BIHOST1* and *BIHOST2*:

   APPLICATIONS_CONFIG/domains/*BIHOST1*/BIDomain/JRFWSAsyncFileStore
6. Click **Save**.
7. Click **Activate Changes**.

   The changes will not take effect until the Managed Server is restarted.
8. Do the following:
   a. Ensure that Node Manager is up and running.
   b. On the Summary of Servers page, select the **Control** tab.
   c. Select **bi_server1** in the table and then click **Shutdown**.
   d. After the server has shut down, select **bi_server1** in the table and then click **Start**.
9. Run the following commands on *BIHOST1* to restart the Oracle Business Intelligence system components:

   UNIX:

```
$ cd APPLICATIONS_CONFIG/BIInstance/bin
$ ./opmnctl stopall
$ ./opmnctl startall
```

18.2.7.4.2 Set the Listen Address for the bi_server1 Managed Server

Make sure that the steps described in Enable Virtual IPs on PROVISIONED_HOST and SCALED_OUT_HOST (page 18-74) have been performed before setting the bi_server1 listen address.

To set the listen address for the Managed Server:

1. Log in to the Administration Console (http://biinternal.mycompany.com/console).
2. In the Change Center, click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Select **bi_server1** in the table. The Settings page for bi_server1 is displayed.
6. Set the **Listen Address** to *BIVH1*.

   Both *BIVH1* and *BIVH2* are pingable.
7. Click **Save**.
8. Click **Activate Changes**.
9. The changes do not take effect until the bi_server1 Managed Server is restarted (ensure that Node Manager is up and running):

a. On the Summary of Servers page, select the **Control** tab.

b. Select **bi_server1** in the table and then click **Shutdown**.

c. After the server has shut down, select **bi_server1** in the table and then click **Start**.

10. Restart the Oracle Business Intelligence system components on *BIHOST1*:

    UNIX:

```
$ cd APPLICATIONS_CONFIG/BIInstance/bin
$ ./opmnctl stopall
$ ./opmnctl startall
```

18.2.7.4.3 Update the FusionVirtualHost_bi.conf Configuration File

To enable Oracle HTTP Server to route to `bi_cluster`, which contains the `bi_server`*n* Managed Servers, set the WebLogicCluster parameter to the list of nodes in the cluster:

1. Update the WebLogicCluster parameter in the `FusionVirtualHost_bi.conf` file to contain a cluster list of virtual *host*:*port* entries. (On *WEBHOST1*: *APPLICATIONS_CONFIG*`/CommonDomain_webtier/config/OHS/ohs1/moduleconf/FusionVirtualHost_bi.conf`. On *WEBHOST2*: *APPLICATIONS_CONFIG*`/CommonDomain_webtier1/config/OHS/ohs2/moduleconf/FusionVirtualHost_bi.conf`.)

   MANDATORY: Update the `FusionVirtualHost_bi.conf` file in two locations:

   - Under the internal virtual host for Oracle Business Intelligence
   - Under the external virtual host for Oracle Business Intelligence

   For example, for the internal virtual host:

```
<LocationMatch ^/analytics/>
SetHandler weblogic-handler
WebLogicCluster BIVH1:10217,BIVH2:10217
</LocationMatch>
```

   For the external virtual host:

```
<LocationMatch ^/analytics/>
SetHandler weblogic-handler
WebLogicCluster BIVH1:10217,BIVH2:10217
WLProxySSL ON
WLProxySSLPassThrough ON
RewriteEngine ON
RewriteOptions inherit
</LocationMatch>
```

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

```
WEBHOST1> APPLICATIONS_CONFIG/CommonDomain_webtier/bin/opmnctl
restartproc
ias-component=ohs1
WEBHOST2> APPLICATIONS_CONFIG/CommonDomain_webtier1/bin/opmnctl
restartproc
ias-component=ohs2
```

   The servers specified in the WebLogicCluster parameters are only important at startup time for the plug-in. The list must provide at least one running cluster

member for the plug-in to discover other members in the cluster. 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 include:

- **Example 1:** If there is a two-node cluster and then a third member is added, it is not necessary to update the configuration to add the third member. The third member is discovered dynamically at run time.
- **Example 2:** There is a three-node cluster, but only two nodes are listed in the configuration. However, if both listed nodes are down when Oracle HTTP Server is started, then the plug-in would fail to route to the cluster. Ensure that at least one of the listed nodes is running when Oracle HTTP Server is started.

  If all the members of the cluster are listed, then guarantee it is possible to route to the cluster, assuming at least one member is running when Oracle HTTP Server is started. For more information on configuring the Oracle WebLogic Serverplug-in, see *Oracle Fusion Middleware Using Web Server 1.1 Plug-Ins with Oracle WebLogic Server*.

18.2.7.5 Scale Oracle Business Intelligence Components

This section describes how to scale out the Oracle Business Intelligence system using the Configuration Assistant. It is assumed that an Oracle Business Intelligence *ORACLE_BASE* (binaries) has already been installed and is available from *BIHOST1* and *BIHOST2*, and that a domain with an Administration Server has been created. This is the domain that will be extended in this section to support Oracle Business Intelligence components.

OPTIONAL: Oracle strongly recommends to read the Oracle Fusion Middleware release notes for any additional installation and deployment considerations before starting the setup process.

This section tells how to do the following:

- Scale out Oracle Business Intelligence on *BIHOST2*
- Start Node Manager in SSL mode
- Scale out the system components
- Configure secondary instances of singleton system components
- Configure the `bi_server2` Managed Server
- Perform additional configuration for Oracle Business Intelligence high availability
- Configure a default persistence store for transaction recovery
- Start and validate Oracle Business Intelligence on *BIHOST2*
- Validate access through Oracle HTTP Server
- Configure Node Manager for the Managed Servers
- Configure server migration for the Managed Servers

18.2.7.5.1 Scale Out the Oracle Business Intelligence System on BIHOST2

To scale out the Oracle Business Intelligence system:

1. Ensure that the `bi_server1` server is running.
2. In the *ORACLE_BASE*`/products/fusionapps/registry.xml` file, change

   ```
   <component name="WebLogic Server" version="10.3.6.0"
   InstallDir="ORACLE_BASE/products/fusionapps/wlserver_10.3">
   ```

   to

   ```
   <component name="WebLogic Server" version="Temporary"
   InstallDir="ORACLE_BASE/products/fusionapps/wlserver_10.3">
   ```

3. Change directory to the location of the Oracle Business Intelligence Configuration Assistant, and then start it:

   UNIX:

   ```
   BIHOST2> APPLICATIONS_BASE/fusionapps/bi/bin
   BIHOST2> ./config.sh
   ```

4. In the Welcome screen, click **Next**.
5. In the Prerequisite Checks screen, verify that all checks complete successfully, and then click **Next**.
6. In the Create, Scale Out or Extend BI System screen, select **Scale Out BI System** and enter the following:
   - **Host Name:** *BIHOST1*
   - **Port:** `10201`
   - **User name:** *WLS_Administrator*
   - **User Password:** *WLS_Administrator_password*

   Click **Next**.
7. In the Scale Out BI System Details screen, enter the following:
   - **Middleware Home:** *APPLICATIONS_BASE*`/fusionapps` (dimmed)
   - **Oracle Home:** *APPLICATIONS_BASE*`/fusionapps/bi` (dimmed)
   - **WebLogic Server Home:** *APPLICATIONS_BASE*`/fusionapps/wlserver_10.3` (dimmed)
   - **Domain Home:** *APPLICATIONS_CONFIG*`/domains/`*BIHOST1*`/BIDomain`
   - **Applications Home:** *APPLICATIONS_CONFIG*`/applications/BIDomain`
   - **Instance Home:** Defaults to *APPLICATIONS_CONFIG*`/BIInstance1`
   - **Instance Name:** `BIInstance1` (dimmed)

   Click **Next**.
8. In the Configure Ports screen, select "Specify Ports using Configuration File."

   Use the `bi_staticports.ini` file from the *APPLICATIONS_BASE*`/ports` directory.

   Click **Next**.
9. In the Specify Security Updates screen, choose to receive security updates from Oracle support or not. To receive updates, enter an e-mail address.

   Click **Next**.
10. In the Summary screen, click **Configure**.

11. In the Configuration Progress screen, verify that all the Configuration Tools have completed successfully and click **Next**.
12. In the Complete screen, click **Finish**.

18.2.7.5.2 Start Node Manager in SSL Mode

To start Node Manager in SSL mode:

1. Stop the default Node Manager running on *BIHOST2* using one of the following methods:
   - Use CTRL+C in the shell where it was started
   - Use the standard process-identification and kill commands in the operating system appropriate to the product and the Oracle Fusion Applications enterprise deployment.
2. Start Node Manager in SSL mode on *BIHOST2*:

   UNIX:

   ```
   BIHOST2> cd APPLICATIONS_CONFIG/nodemanager/BIHOST2
   BIHOST2> ./startNodeManagerWrapper.sh &
   ```

3. Update the Node Manager for the *BIHOST2* machine using the Oracle WebLogic Server Console by doing the following:
   a. Log in to the Administration Server: `http://biinternal.mycompany.com/console`.
   b. Navigate to **BIDomain**, **Environment**, **Machines**.
   c. In the left-hand pane, click **Lock & Edit**.
   d. In the right-hand pane, click *BIHOST2*.
   e. In the window that opens, click the **Node Manager** tab and set the following attributes:

      – Type - SSL

      – Listen Address - <*BIHOST2*>

      – Listen Port - 5556
4. Click **Save** and then **Activate Changes**.

   The changes will not take effect until the `bi_server2` Managed Server is restarted.
5. Do the following:
   a. Stop the Administration Server:

      UNIX:

      ```
      BIHOST1> APPLICATIONS_CONFIG/domains/BIHOST1/BIDomain/bin/stopWebLogic.sh
      ```

   b. Connect to the Administration Server through `nmConnect` and start the Administration Server using `nmstart`.

      – Set the following environment variable:

      UNIX:

```
export WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=
APPLICATIONS_CONFIG/keystores/fusion_trust.jks"
```

– Start the Administration Server:

UNIX:

```
BIHOST1> cd APPLICATIONS_BASE/fusionapps/
wlserver_10.3/common/bin

BIHOST1> ./wlst.sh
```

– In the WLST shell, execute the following command:

```
wls:/offline> nmConnect (username='Admin_User',password='Admin_
Password',host='BIHOST1',port='5556', nmType='ssl', domainDir=
'APPLICATIONS_CONFIG/domains/BIHOST1/BIDomain')

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

The *username* and *password* used in `nmConnect` are the Node Manager credentials (user name and password) specified when creating the provisioning response file.

c. Restart the `bi_server2` Managed Server:

– On the Summary of Servers page, select the **Control** tab.

– Select **bi_server2** in the table and then click **Shutdown**.

– After the server has shut down, select **bi_server2** in the table and then click **Start**.

18.2.7.5.3 Scale the System Components

To scale out the system components, do the following in Oracle Enterprise Manager Fusion Middleware Control:

1. Log in to Fusion Middleware Control (`http://biinternal.mycompany.com/em`).
2. Expand the **Business Intelligence** node in the Farm_BIDomain window.
3. Click **coreapplication**.
4. Click **Capacity Management**, then click **Scalability**.
5. Click **Lock and Edit Configuration**.
6. For the *BIHOST2* BIInstance1 Oracle instance, increment the Oracle Business Intelligence components by 1:
   - BI Servers
   - Presentation Servers
   - JavaHosts
7. Change the **Port Range From** and **Port Range To** to be the same as the *BIHOST1* BIInstance Oracle instance.
8. Click **Apply**.
9. Click **Activate Changes**.

Restart is not needed at this point, because a restart is performed after completing the steps in Configure Secondary Instances of Singleton Components (page 18-44).

18.2.7.5.4 Configure Secondary Instances of Singleton Components

Oracle Business Intelligence Scheduler and Oracle Business Intelligence Cluster Controller are singleton components that operate in active/passive mode. Configure a secondary instance of these components so that they are distributed for high availability.

To configure secondary instances, do the following in Fusion Middleware Control:

1. Log in to Fusion Middleware Control (`http://biinternal.mycompany.com/em`).
2. Expand the **Business Intelligence** node in the Farm_BIDomain window.
3. Click **coreapplication**.
4. Click **Availability**, then click **Failover**.
5. Click **Lock and Edit Configuration** to activate the Primary/Secondary Configuration section of the Availability tab.
6. Specify the Secondary Host/Instance for BI Scheduler and BI Cluster Controller.
7. Click **Apply**.
8. Click **Activate Changes**.
9. Click **Restart to apply recent changes**.
10. From **Manage System**, click **Restart**.
11. Click **Yes** when prompted to confirm to restart all Business Intelligence components.

    Under Potential Single Points of Failure, no problem should be reported for BI Scheduler and BI Cluster Controller.

18.2.7.5.5 Configure the bi_server2 Managed Server

This section explains what to do to configure the `bi_server2` Managed Server.

Setting the Listen Address for the bi_server2 Managed Server

Make sure that the steps described in Enable Virtual IPs on PROVISIONED_HOST and SCALED_OUT_HOST (page 18-74) have been performed before setting the `bi_server2` listen address.

To set the listen address for the Managed Server:

1. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Select **bi_server2** in the table. The settings page for `bi_server2` is displayed.
6. Set the **Listen Address** to *`BIVH2`*.
7. Click **Save**.

8. Click **Activate Changes**.

   The changes will not take effect until the Managed Server is restarted.

9. Do the following:

   a. Ensure that Node Manager is up and running.

   b. On the Summary of Servers page, select the **Control** tab.

   c. Select **bi_server2** in the table and then click **Shutdown**.

   d. After the server has shut down, select **bi_server2** in the table and then click **Start**.

Configuring Custom Identity and Custom Trust for the bi_server2 Managed Server

To configure custom identity and custom trust:

1. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**.

   The Summary of Servers page displays.

5. Select **bi_server2** in the table. The Settings page for `bi_server2` displays.
6. Click **Keystores**, and then do the following:

   a. Click **Change** next to **Demo Identity and Demo Trust**.

   b. Select **Custom Identity and Custom Trust** from the **Keystores** dropdown list and click **Save**.

   c. Under **Identity**, do the following:

      – Change the Custom Identity Keystore entry to point to the *APPLICATIONS_CONFIG*`/keystores/`*BIHOST2*`_fusion_identity.jks` file.

      – Enter and confirm the Custom Identity Keystore Passphrase.

   d. Under **Trust**, do the following:

      – Change the Custom Identity Keystore entry to point to the *APPLICATIONS_CONFIG*`/keystores/fusion_trust.jks` file.

      – Enter and confirm the Custom Trust Keystore Passphrase.

      – Click **Save**.

7. Click **SSL**, and then do the following:

   a. Ensure that Identity and Trust Locations is set to **Keystores**.

   b. Under **Identity**, do the following:

      – Change the Private Key Alias to *BIHOST2*`_fusion`.

      – Enter and confirm the Private Key Passphrase to the *keypassword*.

      – Click **Save**.

8. Click **Activate Changes**.

9. (UNIX) Set the following property in *APPLICATIONS_BASE*/fusionapps/wlserver_10.3/common/bin/wlst.sh:

```
WLST_PROPERTIES=" -Dweblogic.wlstHome='${WLST_HOME}'
-Dweblogic.security.SSL.trustedCAKeyStore=APPLICATIONS_CONFIG/keystores/
fusion_trust.jks ${WLST_PROPERTIES}"
```

Disabling Host Name Verification for the bi_server2 Managed Server

This step is required if the appropriate certificates have not been set up to authenticate the different nodes with the Administration Server. If the server certificates have not been configured, errors are displayed during the management of the different WebLogic servers. To avoid these errors, disable host name verification while setting up and validating the topology, and enable it again after the topology configuration is complete.

To disable host name verification:

1. Log in to Oracle WebLogic Server Administration Console (http://biinternal.mycompany.com/console).
2. Click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Select **bi_server2** in the table. The settings page for the server is displayed.
6. Click the **SSL** tab.
7. Expand the **Advanced** section of the page.
8. Set **Host Name Verification** to **None**.
9. Click **Save**.
10. Click **Activate Changes**.
11. The change will not take effect until the bi_server2 Managed Server is restarted (make sure that Node Manager is up and running):
    a. In the Summary of Servers screen, select the **Control** tab.
    b. Select **bi_server2** in the table and then click **Shutdown**.
    c. Select **bi_server2** in the table and then click **Start**.
12. Restart the Oracle Business Intelligence system components on *BIHOST2*:

    UNIX:

```
$ cd APPLICATIONS_CONFIG/BIInstance1/bin
$ ./opmnctl stopall
$ ./opmnctl startall
```

Adding bi_server2 System Properties to the Server Start Tab

After scaling out the bi_server2 Managed Server, add a new system property to the **Server Start** tab of this Managed Server.

1. Log in to the Oracle WebLogic Server Administration Console (http://biinternal.mycompany.com/console).
2. Click **Lock & Edit**.

3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**.

   The Summary of Servers page displays.
5. Select **bi_server2** in the table.

   The settings page for the server displays.
6. Click **Server Start**.
7. Add the following property to the arguments:

   ```
   -DJDBCProgramName=DS/BIDomain/bi_server2
   ```
8. Click **Save** and then **Activate Changes**.
9. Restart the `bi_server2` Managed Server (ensure sure that Node Manager is up and running):
   a. In the Summary of Servers screen, select the **Control** tab.
   b. Select **bi_server2** in the table and then click **Shutdown**.
   c. Select **bi_server2** in the table and then click **Start**.
10. Restart the BI System Components on *BIHOST2*:

    UNIX:

    ```
    $ cd APPLICATIONS_CONFIG/BIInstance1/bin
    $ ./opmnctl stopall
    $ ./opmnctl startall
    ```

18.2.7.5.6 Perform Additional Configuration for Oracle Business Intelligence High Availability

This section describes additional high availability configuration tasks for Oracle BI Enterprise Edition, Oracle Real-Time Decisions, Oracle BI Publisher, and Oracle Financial Reports.

Additional Configuration Tasks for Oracle BI Scheduler

If server-side scripts are used with Oracle BI Scheduler, it is recommended to configure a shared directory for the scripts so that they can be shared by all Oracle BI Scheduler components in a cluster.

Perform these steps only if server-side scripts are used.

To share Oracle BI Scheduler scripts:

1. Create an *APPLICATIONS_CONFIG*/BIShared/OracleBISchedulerComponent/coreapplication_obisch1 directory.
2. From *BIHOST1*, copy the default Oracle BI Scheduler scripts (for example, *APPLICATIONS_CONFIG*/BIInstance/bifoundation/OracleBISchedulerComponent/coreapplication_obisch1/scripts/common) and custom Oracle BI Scheduler scripts (for example, *APPLICATIONS_CONFIG* /BIInstance/bifoundation/OracleBISchedulerComponent/coreapplication_obisch1/scripts/scheduler) to the following location:

APPLICATIONS_CONFIG/BIShared/OracleBISchedulerComponent/coreapplication_obisch1

3. Update the SchedulerScriptPath and DefaultScriptPath elements of the Oracle BI Scheduler `instanceconfig.xml` file, as follows:

   - SchedulerScriptPath: Refers to the path where Oracle BI Scheduler-created job scripts are stored. Change this to the path of the shared BI Scheduler scripts location.
   - DefaultScriptPath: Specifies the path where user-created job scripts (not agents) are stored. Change this to the path of the shared BI Scheduler scripts location.

   The `instanceconfig.xml` files for Oracle BI Scheduler are in the following locations:

   On *BIHOST1:*: *APPLICATIONS_CONFIG*/BIInstance/config/OracleBISchedulerComponent/coreapplication_obisch1

   On *BIHOST2:* *APPLICATIONS_CONFIG* /BIInstance1/config/OracleBISchedulerComponent/coreapplication_obisch1

   Update these files for each Oracle BI Scheduler component in the deployment.

4. Restart the Oracle BI Scheduler component.

   On *BIHOST1*:

   UNIX:

   ```
   $ cd APPLICATIONS_CONFIG/BIInstance/bin
   $ ./opmnctl stopproc
   ias-component=coreapplication_obisch1
   $ ./opmnctl startproc
   ias-component=coreapplication_obisch1
   ```

   On *BIHOST2*:

   UNIX:

   ```
   $ cd APPLICATIONS_CONFIG/BIInstance1/bin
   $ ./opmnctl stopproc
   ias-component=coreapplication_obisch1
   $ ./opmnctl startproc
   ias-component=coreapplication_obisch1
   ```

Additional Configuration Tasks for Oracle Real-Time Decisions

This sections contains information about the following:

- Configuring Oracle Real-Time Decisions clustering
- Adding Oracle RTD system properties to the server start tab

Configuring Oracle Real-Time Decisions Clustering Properties

Perform these steps in Fusion Middleware Control to set up cluster-specific configuration properties for Oracle Real-Time Decisions (Oracle RTD). It is only necessary to perform the steps on one of the nodes in the deployment. It is not necessary to set cluster-specific configuration properties for Oracle RTD for subsequent nodes.

1. Log in to Fusion Middleware Control (`http://biinternal.mycompany.com/em`).

2. Expand the **Application Deployments** node in the Farm_BIDomain window.
3. Expand **Oracle RTD(11.1.1)(bi_cluster)**.
4. Click any node under it. For example, **Oracle RTD(11.1.1)(bi_server1)**.
5. In the right pane, click **Application Deployment**, and then select **System MBean Browser**.
6. In the System MBean Browser pane, expand **Application Defined MBeans**.
7. For any one of the servers under Oracle RTD, navigate to the MBean and set the attribute, as shown in the following table. Other servers automatically get updated with the value that is set.

Table 18-2 Oracle RTD MBean Attributes and Values for Clustering

MBean	Attribute	Value
SDClusterPropertyManager -> Misc	DecisionServiceAddress	`http://biinternal.mycompany.com`

8. Click **Apply**.

Adding Oracle RTD System Properties to the Server Start Tab

After scaling out Oracle RTD, use the Administration Console to add three system properties to the **Server Start** tab of each Managed Server.

1. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).
2. Click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**.

   The Summary of Servers page displays.
5. Select **bi_server<1,2>** in the table.

   The settings page for the server displays.
6. Click **Server Start**.
7. Add the following property to the arguments:

```
-Drtd.clusterRegistryJobIntervalMs=12000
-Drtd.clusterDepartureThresholdMs=50000
-Drtd.clusterDepartureThreshold2Ms=50000
```

8. Click **Save** and then **Activate Changes**.
9. Restart the `bi_server<1,2>` Managed Server (ensure sure that Node Manager is up and running):
   a. In the Summary of Servers screen, select the **Control** tab.
   b. Select **bi_server<1,2>** in the table and then click **Shutdown**.
   c. Select **bi_server<1,2>** in the table and then click **Start**.
10. Restart the BI System Components on *`BIHOST1`* and *`BIHOST2`*:

    UNIX:

```
$ cd APPLICATIONS_CONFIG/BIInstancen/bin
$ ./opmnctl stopall
$ ./opmnctl startall
```

Performing this task enables an instance of Oracle RTD to be migrated successfully from one host to another in the event of a failure of a Managed Server.

Even after these changes, if the server migration finishes in less than 50 seconds, the Oracle RTD batch framework is in an inconsistent state.

If the enterprise has deployed any RTD Inline Services that host Batch Job implementations, and if after a server migration the batch console command, "batch-names", or its brief name, "bn", shows no registered batch jobs, then the Oracle RTD Batch Manager service must be stopped and restarted. To do this, perform these steps:

1. In Fusion Middleware Control, expand the **WebLogic Domain** node in the left pane. Then, right-click **BIDomain** and select **System MBean Browser**.
2. Locate **SDPropertyManager**, **Misc MBean** under **Application Defined MBeans**, **OracleRTD**, **Server:bi_server *n***.

   Be sure to select the **Misc MBean** that corresponds to the local node where the change is being made. For example, in case of connecting to *APPHOST1*, then make sure to update the attribute associated with `bi_server1`.
3. Set the **BatchManagerEnabled** attribute to **false** and click **Apply**.
4. Set the **BatchManagerEnabled** attribute back to **true** and click **Apply**. Performing this task causes the Batch Manager to stop and be restarted.

   When it restarts, it runs on either the same server as before, or on a different server.
5. After restarting Batch Manager, note that the corresponding MBean does not always immediately get refreshed on the server where Batch Manager comes back up, so this is not a concern. Instead, verify that Batch Manager is now operational by using the Batch Console tool:

   a. Locate the zip file for the Oracle RTD client tools in the following location:

      APPLICATIONS_BASE`/fusionapps/bi/clients/rtd/rtd_client_11.1.1.zip`

   b. Because most Oracle RTD client tools do not run on UNIX, unzip this file in a location on a Windows machine (referred to here as *RTD_HOME*). Then, locate the batch console jar file in:

      RTD_HOME`/client/Batch/batch-console.jar`

   c. Change to this directory and execute the jar, passing to it the URL and port of either the Managed Server, or of the cluster proxy:

      `java -jar batch-console.jar -url http://`*SERVER*`:`*PORT*

   d. When prompted, enter the user name and password of a user who is a member of the Administrator role, BI_Adminstrator role, or some other role authorized to administer Oracle RTD batch jobs.

   e. When prompted for a command, enter `bn`:

```
Checking server connection...
command: bn
    CrossSellSelectOffers
command:quit
```

If Batch Manager has successfully restarted, then the `bn` command lists the names of all batch implementations hosted by all deployed RTD Inline Services.

The commonly deployed example, CrossSell, hosts a batch implementation named CrossSellSelectOffers, shown in the preceding example.

Additional Configuration Tasks for Oracle BI Publisher

Perform the steps in this section on each machine where Oracle BI Publisher is configured.

Configuring Integration with Oracle BI Presentation Services

To configure Oracle BI Publisher integration with Oracle BI Presentation Services:

1. Log in to Oracle BI Publisher (`http://biinternal.mycompany.com/xmlpserver`) with Administrator credentials and select the **Administration** tab.
2. Under **Integration**, select **Oracle BI Presentation Services**.
3. Verify and update the following:
   - **Server Protocol:** http
   - **Server:** biinternal.mycompany.com
   - **Port:** 80
   - **URL Suffix:** analytics-ws/saw.dll
4. Click **Apply**.
5. Under System Maintenance, select **Server Configuration**.

   In the Catalog section, change the BI Publisher Repository value to the shared location for the Configuration Folder. For example:

   `APPLICATIONS_CONFIG``/BIShared/BIPublisher/repository`
6. Click **Apply**.
7. Restart the Oracle BI Publisher application:
   a. Log in to the Administration Console (`http://biinternal.mycompany.com/console`).
   b. Click **Deployments** in the Domain Structure window.
   c. Select **bipublisher(11.1.1)**.
   d. Click **Stop**, and then select **When Work Completes** or **Force Stop Now**.
   e. After the application has stopped, click **Start** and then **Start Servicing All requests**.

Setting the Oracle BI Enterprise Edition Data Source

The Oracle BI EE Data Source must point to the clustered Oracle BI Servers through the Cluster Controllers. Perform this task in Oracle BI Publisher.

To set the Oracle BI EE data source in Oracle BI Publisher:

1. Log in to Oracle BI Publisher (`http://biinternal.mycompany.com/xmlpserver`) with Administrator credentials and select the **Administration** tab.
2. Under **Data Sources**, select **JDBC Connection**.

3. Update the Oracle BI EE data source setting by changing the **Connection String** parameter to the following:

   ```
   jdbc:oraclebi://primary_cluster_controller_host:primary_cluster_controller_
   port/
   PrimaryCCS=primary_cluster_controller_host;PrimaryCCSPort=primary_cluster_
   controller_port;SecondaryCCS=secondary_cluster_controller_host;
   SecondaryCCSPort=secondary_cluster_controller_port;
   ```

   For example:

   ```
   jdbc:oraclebi://BIHOST1:10212/PrimaryCCS=BIHOST1;PrimaryCCSPort=10212;
   SecondaryCCS=BIHOST2;SecondaryCCSPort=10212;
   ```

   Since the Cluster Controller Port may be different between *BIHOST1* and *BIHOST2*, use the following procedure to check the port being used:

   a. Log in to the Oracle Enterprise Manager Console: `http://biinternal.mycompany.com/em`.

   b. Expand **Farm_Domain**, **Business Intelligence**, **coreapplication**.

   c. Navigate to **Availability**.

   d. Check the port number used by the Cluster Controller on *BIHOST1* and *BIHOST2*.

4. Do one of the following:

   - Select **Use System User**.
   - Deselect **Use System User** and specify BIImpersonateUser credentials.

   See Credentials for Connecting to the Oracle BI Presentation Catalog in *Oracle Fusion Middleware Developer's Guide for Oracle Business Intelligence Enterprise Edition*.

5. Click **Test Connection**. A "Connection established successfully" message should be received.

6. Click **Apply**.

Configuring Java Message Service for Oracle BI Publisher

Configure the location for the persistence store to the Oracle Fusion Applications database.

On *BIHOST2*:

1. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).

2. In the Domain Structure window, expand the **Services** node and then click the **Persistence Stores** node. The Summary of Persistence Stores page is displayed.

3. Click **Lock & Edit**.

4. Click **New**, and then **Create JDBCStore**.

5. Enter a name (for example, `BipJDBCStore-bi_server2`) and target (for example, `bi_server2`). Select **bip_datasource** as the data source, and enter `Bip_bi_server2_` as the prefix name.

6. Click **OK** and then **Activate Changes**.

7. In the Domain Structure window, expand the **Services** node and then click the **Messaging**, **JMS Servers** node. The Summary of JMS Servers page is displayed.
8. Click **Lock & Edit**.
9. Click **New**.
10. Enter a name (for example, `BipJmsServer-bi_server2`) and in the **Persistence Store** drop-down list, select **BipJDBCStore-bi_server2** and click **Next**.
11. Select **bi_server2** as the target.
12. Click **Finish** and **Activate Changes**.
13. In the Domain Structure window, expand the **Services** node and then click the **Messaging**, **JMS Modules** node. The JMS Modules page is displayed.
14. In the Change Center, click **Lock & Edit**.
15. Click **BipJmsResource** and then click the **Subdeployments** tab.
16. Select **BipJmsSubDeployment** under **Subdeployments**.
17. Add the new Oracle BI Publisher JMS Server (**BipJmsServer-bi_server2**) as an additional target for the subdeployment.
18. Click **Save** and then **Activate Changes**.

To validate, do the following:

1. Log in to each Oracle BI Publisher URL.
2. Navigate to **Administration**, **System Maintenance**, **Scheduler Diagnostics**.

   All statuses should be in a Passed state and both instances should be visible.

Additional Configuration Tasks for Oracle Business Intelligence for Microsoft Office

The information in this section tells how to do the following:

- Configure Oracle Business Intelligence for Microsoft Office properties
- Validate Oracle Business Intelligence for Microsoft Office

Configuring Oracle Business Intelligence for Microsoft Office Properties

To perform additional configuration tasks for Oracle Business Intelligence for Microsoft Office:

1. Validate the Oracle BI Enterprise Edition Office Server setup by accessing `http://biinternal.mycompany.com/bioffice/about.jsp`.

   The About Oracle BI EE Office Server page displays.
2. Go to the Oracle BI Enterprise Edition Office Server directory. For example:

   APPLICATIONS_CONFIG`/domains/`*BIHOST1*`/BIDomain/servers/bi_server1/tmp/_WL_user/bioffice_11.1.1/cvsibb/war/WEB-INF`

   To locate the Oracle BI Enterprise Edition Office Server directory, check the **LogDir** parameter on the About Oracle BI EE Office Server page. The Oracle BI Enterprise Edition Office Server directory is the parent directory of the log directory.

   Determine the exact location for *BIHOSTn* by using the following URL: `http://BIVH`*n*`:10217/bioffice/about.jsp`.

3. On both*BIHOST1* and *BIHOST2*, open bioffice.xml for editing and modify the BI Office properties shown in the following table.

Table 18-3 BI Office Properties in bioffice.xml

Property Name	Valid Value	Description
SawBaseURL	http://biinternal.mycompany.com/analytics/saw.dll or http://biinternal.mycompany.com/analytics-ws/saw.dll	Load Balancer Virtual Server Name URL for Oracle BI Presentation Services. **Important:** If SSO is enabled, then enter the URL for the protected analytics servlet deployed when configuring BI Office to integrate with the SSO-enabled Oracle BI Server. The URL that is specified for this property is used for Web services requests between the BI Office Server and Presentation Services.
SawUseSSO	0 = No (Default) 1 = Yes	Set this property to 1 if the Oracle Business Intelligence implementation is enabled for SSO.
SawWebURLforSSO	http://biinternal.mycompany.com/analytics/saw.dll	When SSO is enabled, use this property to enter the public URL that allows external users to access Oracle Business Intelligence using SSO from the Oracle BI Add-in for Microsoft Office.

4. Restart the BI Office application:
   a. Log in to the Administration Console (`http://biinternal.mycompany.com/console`).
   b. Click **Deployments** in the Domain Structure window.
   c. Select **bioffice(11.1.1)**.
   d. Click **Stop**.
   e. After the application has stopped, click **Start**.
5. Validate that the **SawBaseURL** parameter has been updated on the About Oracle BI EE Office Server page.

Validating Oracle Business Intelligence for Microsoft Office

To validate configuration for Oracle Business Intelligence for Microsoft Office:

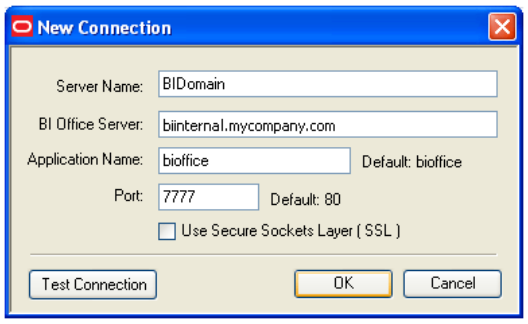
1. Log in to Oracle BI Presentation Services at:

   `http://biinternal.mycompany.com/analytics`
2. In the lower left pane, under the Get Started heading, select **Download BI Desktop Tools** and then select **Oracle BI for MS Office**.
3. Install Oracle BI for Microsoft by running the Oracle BI Office InstallShield Wizard.
4. Open Microsoft Excel or Microsoft PowerPoint.
5. From the **Oracle BI** menu, select **Preferences**.

6. In the **Connections** tab, select **New**.
7. Enter values for the following fields:
   - **Server Name:** Provide a name for the connection.
   - **BI Office Server:** Provide the URL for the Oracle BI Office Server.
   - **Application Name:** Enter the Application Name defined for the Oracle BI Office Server when the Oracle BI Office Server application was deployed to Oracle WebLogic Server. The default name is **bioffice**.
   - **Port:** Enter the Oracle BI Office Server port number.

   The following figure shows the New Connection dialog.

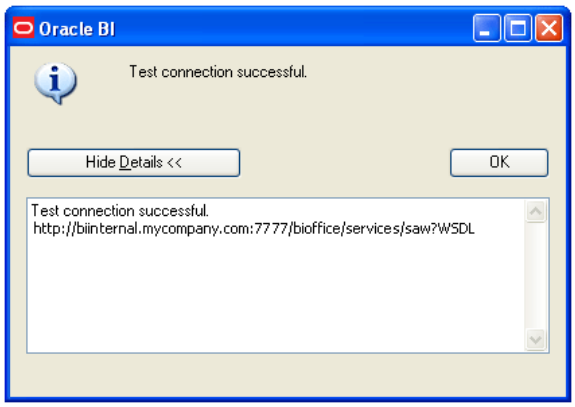
Figure 18-1 New Connection Dialog for Oracle BI Office



8. Click **Test Connection** to test the connection between the add-in and the Oracle BI Office Server.

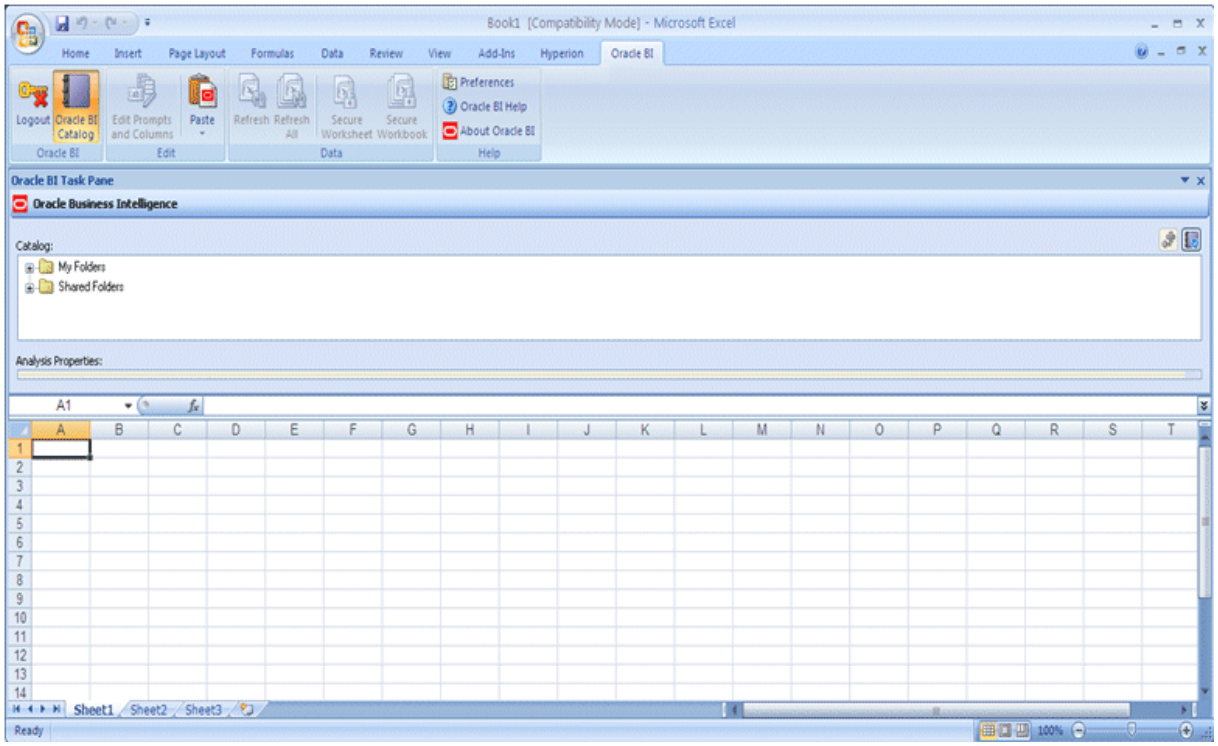
   Successful connections receive a "Test connection successful" message, as shown in the following figure.

Figure 18-2 Test Connection Successful Message



9. Log in as an Administrator (for example, `weblogic`) and validate that it is possible to access the Oracle BI Task Pane, as shown in the following figure.

Figure 18-3 Oracle BI Task Pane in Microsoft Excel



Additional Configuration Tasks for Oracle Financial Reporting

There are additional configuration tasks to perform for Oracle Financial Reporting. Do the following on *BIHOST1* and *BIHOST2*:

1. Update the `VARIABLE_VALUE_LIMIT` from 4096 to 3072000 in the `NQSConfig.INI` file. For example,

   ```
   VARIABLE_VALUE_LIMIT = 3072000;
   ```

   On *BIHOST1*, this file is located in *APPLICATIONS_CONFIG*`/BIInstance/config/OracleBIServerComponent/coreapplication_obis1`.

   On *BIHOST2*, this file is located in *APPLICATIONS_CONFIG*`/BIInstance1/config/OracleBIServerComponent/coreapplication_obis1`.

2. Run the following commands to restart the Oracle Business Intelligence system components on *BIHOST1* and *BIHOST2*:

   UNIX:

   ```
   $ cd APPLICATIONS_CONFIG/BIInstancen/bin
   $ ./opmnctl stopall
   $ ./opmnctl startall
   ```

18.2.7.5.7 Configure 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 Oracle WebLogic Server uses this transaction log for recovery from system crashes or network failures. To leverage the migration capability of the Transaction Recovery

Service for the servers within a cluster, store the transaction logs in the Oracle Fusion Applications database.

To set the location for the default persistence store:

1. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. In the Domain Structure window, expand the **Environment** node and then click the **Servers** node. The Summary of Servers page is displayed.
4. Click **bi_server2** in the table. The Settings page for the selected server is displayed, and defaults to the Configuration tab.
5. Navigate to **Configuration > Services**.
6. In the Transaction Log Store section of the page, do the following:
   - For the type, select **JDBC** from the dropdown list. list.
   - For the data store, select **bip_datasource** from dropdown list.
   - For the prefix name, enter `TLOG_bi_server2_`.
7. Click **Save**.
8. Click **Activate Changes**.
9. Restart `bi_server2` to activate the changes:
   a. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).
   b. In the Summary of Servers screen, select the **Control** tab.
   c. Select **bi_server2** in the table and then click **Shutdown**.
   d. Start the `bi_server2` server.
   e. Restart the Oracle Business Intelligence system components on *`BIHOST2`*:

      UNIX:

      ```
      $ cd APPLICATIONS_CONFIG/BIInstance1/bin
      $ ./opmnctl stopall
      $ ./opmnctl startall
      ```

18.2.7.5.8 Start and Validate Oracle Business Intelligence on BIHOST2

This information in this section tells how to do the following:

- Start the `bi_server2` Managed Server
- Start the Oracle Business Intelligence system components
- Validate Oracle Business Intelligence URLs

Starting the bi_server2 Managed Server

To start the `bi_server2` Managed Server:

1. Start the `bi_server2` Managed Server using the Oracle WebLogic Server Administration Console, as follows:

a. Log in to the Oracle WebLogic Server Administration Console (`http://biinternal.mycompany.com/console`).

b. Expand the **Environment** node in the **Domain Structure** window.

c. Select **Servers**. The Summary of Servers page is displayed.

d. Click the **Control** tab.

e. Select **bi_server2** 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.

Starting the Oracle Business Intelligence System Components

Control Oracle Business Intelligence system components using `opmnctl` commands.

To start the Oracle Business Intelligence system components using the `opmnctl` command-line tool:

1. Go to the directory that contains the Oracle Process Manager and Notification Server command-line tool, located in *`APPLICATIONS_CONFIG`*`/BIInstance1/bin`.

2. Run the `opmnctl` command to start the Oracle Business Intelligence system components

   - (UNIX)`./opmnctl startall`: Starts Oracle Process Manager and Notification Server and all Oracle Business Intelligence system components
   - (UNIX)`./opmnctl start`: Starts Oracle Process Manager and Notification Server only
   - (UNIX)`./opmnctl startproc ias-component=`*`component_name`*: Starts a particular system component. For example, where `coreapplication_obips1` is the Presentation Services component:

     UNIX:

     ```
     ./opmnctl startproc ias-component=coreapplication_obips1
     ```

3. Check the status of the Oracle Business Intelligence system components:

   UNIX:

   ```
   ./opmnctl status
   ```

   UNIX:

   ```
   opmnctl status
   ```

Validating Oracle Business Intelligence URLs

Access the following URLs:

- Access `http://BIVH2:10217/analytics` to verify the status of `bi_server2`.
- Access `http://BIVH2:10217/wsm-pm` to verify the status of Web Services Manager. Click **Validate Policy Manager**. A list of policies and assertion templates available in the data is displayed.

  WARNING: The configuration is incorrect if no policies or assertion templates appear.

- Access `http://BIVH2:10217/xmlpserver` to verify the status of the Oracle BI Publisher application.
- Access `http://BIVH2:10217/ui` to verify the status of the Oracle Real-Time Decisions application.
- Access `http://BIVH2:10217/mapviewer` to verify the status of the map view functionality in Oracle BI EE.
- Access `http://BIVH2:10217/hr` to verify Financial Reporting.
- Access `http://BIVH2:10217/calcmgr/index.htm` to verify Calculation Manager.
- Access `http://BIVH2:10217/aps/Test` to verify APS.
- Access `http://BIVH2:10217/workspace` to verify workspace.

18.2.7.5.9 Validate Access Through Oracle HTTP Server

Verify URLs to ensure that the appropriate routing and failover is working from Oracle HTTP Server to bi_cluster. Perform these steps to verify the URLs:

1. While `bi_server2` is running, stop `bi_server1` using the Oracle WebLogic Server Administration Console.
2. Access the following URLs to verify that routing and failover is functioning properly:
   - `http://WEBHOST1:10621/analytics`
   - `http://WEBHOST1:10621/xmlpserver`
   - `http://WEBHOST1:10621/ui` (access only available on Microsoft Internet Explorer 7 or 8)
   - `http://WEBHOST1:10621/hr`
   - `http://WEBHOST1:10621/calcmgr/index.htm`
   - `http://WEBHOST1:10621/aps/Test`
   - `http://WEBHOST1:10621/workspace`
3. Start `bi_server1` from the Oracle WebLogic Server Administration Console.
4. Stop `bi_server2` from the Oracle WebLogic ServerAdministration Console.
5. Access the following URLs to verify that routing and failover is functioning properly:
   - `http://WEBHOST1:10621/analytics`
   - `http://WEBHOST1:10621/xmlpserver`
   - `http://WEBHOST1:10621/ui` (access only available on Microsoft Internet Explorer 7 or 8)
   - `http://WEBHOST1:10621/hr`
   - `http://WEBHOST1:10621/calcmgr/index.htm`
   - `http://WEBHOST1:10621/aps/Test`
   - `http://WEBHOST1:10621/workspace`
6. Start `bi_server2` from the Oracle WebLogic ServerAdministration Console.

18.2.7.5.10 Configure Node Manager for the Managed Servers

Oracle recommends using host name verification for the communication between Node Manager and the servers in the domain. This requires the use of certificates for the different addresses communicating with the Administration Server and other servers. See Scale Out Node Manager (page 18-8). for further details. The procedures in that section must be performed twice using the information provided in the following table.

Table 18-4 Details for Host Name Verification for Node Manager and Servers

Run	Host Name (Host)	Server Name (WLS_SERVER)
Run1:	*BIHOST1*	bi_server1
Run2:	*BIHOST2*	bi_server2

If Node Manager is configured for the Managed Servers earlier, it is not necessary to configure it again.

18.2.7.5.11 Configure Server Migration for the Managed Servers

Server migration is required for proper failover of the Oracle BI Publisher components in the event of failure in any of the *BIHOST1* and *BIHOST2* nodes. See Set Up Server Migration for Oracle Fusion Applications (page 18-91).

18.2.7.6 Configure and Validate Oracle Essbase Clustering

This section describes how to configure and validate secondary instances of Oracle Essbase Agent so that they are distributed for high availability.

Using Essbase in a Multi-Node Real Application Cluster (RAC) Oracle Fusion Applications Database Environment:

Currently in an Oracle Fusion Applications environment provisioned with multi-node RAC database instances, Essbase is configured to connect only to the primary Oracle Real Application Clusters (RAC) node through Open Database Connectivity (ODBC). The connection does not fail over to other RAC nodes when the primary node is down. This means that the primary RAC node must be running when Oracle Fusion Applications uses Essbase to provide online analytical processing capabilities.

When Oracle Fusion Applications functionality fails due to Essbase, check if the primary RAC node is up and running. If the primary RAC node is down, restarting it resolves the failure. There is currently no workaround to make the connection failover to other RAC nodes.

Perform the following steps in Fusion Middleware Control to scale out the secondary Oracle Essbase Agent:

1. Log in to Fusion Middleware Control (`http://biinternal.mycompany.com/em`).
2. Expand the **Business Intelligence** node in the Farm_BIDomain window.
3. Click **coreapplication**.
4. Click **Availability**, then click **Failover**.

5. Click **Lock and Edit Configuration** to activate the Primary/Secondary Configuration section of the **Availability** tab.
6. Specify the Secondary Host/Instance for Essbase Agent.
7. Ensure the **Shared Folder Path** is set to *APPLICATIONS_CONFIG*/BIShared/Essbase/essbaseserver1 and click **Apply**.
8. Click **Activate Changes**.
9. Under Manage System, click **Restart**.
10. Click **Yes** in the confirmation dialog.

    Under Potential Single Points of Failure, no problems should be reported for Essbase Agent.

Do the following to validate Essbase clustering:

1. Check the APS (Hyperion Provider Services) test URL:

   ```
   http://biinternal.mycompany.com/aps/Essbase?Clustername=Essbase_FA_Cluster
   ```

   The message "Hyperion Provider Services: Hello!" should display.
2. Run the following command on *BIHOST1*:

   UNIX:

   ```
   APPLICATIONS_CONFIG/BIInstance/bin/opmnctl stopproc
   ias-component=essbaseserver1
   ```
3. Ensure that Essbase starts on *BIHOST2*:

   UNIX:

   ```
   APPLICATIONS_CONFIG/BIInstance1/bin/opmnctl status
   ```

   The status should be `init` then `Alive`.
4. Check the APS test URL again:

   ```
   http://biinternal.mycompany.com/aps/Essbase?Clustername=Essbase_FA_Cluster
   ```

18.2.7.7 Validate the System

Verify URLs to ensure that the appropriate routing and failover is working from Oracle HTTP Server to `bi_cluster`. Perform these steps to verify the URLs:

1. While `bi_server2` is running, stop `bi_server1` using the Oracle WebLogic Server Administration Console.
2. Access the following URLs to verify that routing and failover is functioning properly:
   - `http://WEBHOST1:10621/analytics`
   - `http://WEBHOST1:10621/xmlpserver`
   - `http://WEBHOST1:10621/ui` (access only available on Microsoft Internet Explorer 7 or 8)
   - `http://WEBHOST1:10621/hr`
   - `http://WEBHOST1:10621/workspace`
   - `http://WEBHOST1:10621/calcmgr/index.htm`

- `http://WEBHOST1:10621/aps/Test`

3. Start `bi_server1` from the Oracle WebLogic Server Administration Console.
4. Stop `bi_server2` from the Oracle WebLogic Server Administration Console.
5. Access the following URLs to verify that routing and failover is functioning properly:
   - `http://WEBHOST1:10621/analytics`
   - `http://WEBHOST1:10621/xmlpserver`
   - `http://WEBHOST1:10621/ui` (access only available on Microsoft Internet Explorer 7 or 8)
   - `http://WEBHOST1:10621/hr`
   - `http://WEBHOST1:10621/workspace`
   - `http://WEBHOST1:10621/calcmgr/index.htm`
   - `http://WEBHOST1:10621/aps/Test`
6. Start `bi_server2` from the Oracle WebLogic Server Administration Console.

18.2.8 Scale Up: Add Managed Servers to Existing Hosts

Scale out and or scale up an Oracle Fusion Applications environment. When scaling out, add a new instance of a Managed Server to a new host (called *SCALED_OUT_HOST* in previous sections) that does not already have the Managed Server running in it. When scaling up, add a new instance of a Managed Server in an existing host (either a *PROVISIONED_HOST* or *SCALED_OUT_HOST*) that already has one or more instances of the Managed Server running in it.

This section describes how to scale up an environment by adding a new instance of a Managed Server to an existing host, called *SCALED_UP_HOST*. Note that a *SCALED_UP_HOST* is one of the *PROVISIONED_HOST* or *SCALED_UP_HOST* that are already part of the Oracle Fusion Applications environment. For clarity in this section, we use *SCALED_UP_MGD_SERVER* to denote the Managed Server to be scaled up.

This section explains how to do the following:

- Scale up the topology (add Managed Servers to an existing node) for Oracle ADF server
- Scale out the topology (add Managed Servers to a new node) for Oracle SOA Suite server
- Scale up the topology (add Managed Servers to an existing node) for Oracle SOA Suite server
- Scale up the topology (add Managed Servers to an existing node) for Oracle Business Intelligence

18.2.8.1 Scale Up Oracle Fusion Applications Managed Servers to an Existing Host

Before performing the tasks in this section, ensure that the Managed Server (*SCALED_UP_MGD_SERVER*) to be scaled up and its domain (referred to as *domain*) is running.

18.2.8.1.1 Clone Managed Servers and Assign Them to SCALED_UP_HOST

To add a Managed Server (*SCALED_UP_MGD_SERVER*) and assign it to *SCALED_UP_HOST*:

1. Log in to the Administration Server: `http://`*`domain_name`*`internal.mycompany.com/console`.
2. Navigate to ***Domain_Name*** ,**Environment**, **Servers**.
3. Switch to **Lock & Edit** mode.
4. Select the ***SCALED_UP_MGD_SERVER*** checkbox and then click **Clone**.
5. Specify the following Server Identity attributes:
   - Server Name - *SCALED_UP_MGD_SERVER_n*

     To ensure consistency in naming, copy the name of the server shown in **Server Identity** and paste it into the **Server Name** field. Increase the number of instances of *SCALED_UP_MGD_SERVER* by one and use that number to replace "*n*" at the end of the server name. Oracle recommends following the managed server naming convention *NamedManagedServer_n*.
   - Server Listen Address - <*SCALED_UP_HOST*> (This is the existing host where the new instance of *SCALED_UP_MGD_SERVER* is added.)
   - Server Listen Port - Give an unused port on the machine *SCALED_UP_HOST*
6. Click **OK**.
7. Navigate back to ***Domain_Name***, **Environment**, **Servers**. See the newly cloned server, *SCALED_UP_MGD_SERVER_n*.
8. From **SCALED_UP_MGD_SERVER_*n***, click **Advanced** and then select the **WebLogic Plug-In Enabled** checkbox.
9. Click **Save** and then click **Activate Changes**.
10. Run the newly created Managed Server:
    a. Navigate to ***Domain_Name***, **Environment**.
    b. From the **Navigation** pane on the Oracle WebLogic Server console, select **Activate Changes**.
    c. Navigate to ***Domain_Name***, **Environment**, **Servers**, **Control**.
    d. Check the newly created Managed Server and click **Start**.
    e. Navigate to ***Domain_Name***, **Environment**, **Servers** and check the **State** to verify that the newly created Managed Server is running.
11. Log in to the Administration Server once again (`http://`*`domain_name`*`internal.mycompany.com/console`) and verify that all the Managed Servers, including the new instance of the scaled-up Managed Server, are running.
12. Do the following:
    a. Switch to **Lock & Edit** mode.
    b. Select the ***SCALED_UP_MGD_SERVER*** checkbox.
    c. Select the **Server Start** tab.

d. Change the Arguments to reflect the name of the cloned Managed Server and make sure the server group is the correct cluster name. For example, the following should be seen:

```
-DJDBCProgramName\=DS/domain_name/SCALED_UP_MGD_SERVER_n
-Dserver.group\=SCALED_UP_MGD_SERVERCluster
```

The naming convention of a *SCALED_UP_MGT_SERVER_CLUSTER* is the name of the managed server appended with "Cluster" after dropping "Server_n". For example, if *SCALED_UP_MGD_SERVER_n* is HomePageServer_4, its cluster (that is, server group) is HomePageCluster.

e. Click **Save**.

13. Select the **Logging** tab, and then select the **HTTP** tab.
14. Do the following:
    a. Change the Log file name to `logs/access.log.%yyyyMMdd%`.
    b. Change the rotation type to **By Time**.
    c. Leave the **Limit number of retained files** option unchecked.
    d. Leave the **Rotate log file on startup** option unchecked.
    e. Click **Save**.
    f. Expand **Advanced**.
    g. Change the format to **Extended**.
    h. Change the extended logging format fields to the following:

```
date time time-taken cs-method cs-uri
sc-status sc(X-ORACLE-DMS-ECID)
cs(ECID-Context) cs(Proxy-Remote-User)
cs(Proxy-Client-IP)
```

    i. Click **Save**.
15. Click **Activate Changes**.
16. Restart the *SCALED_UP_MGD_SERVER_n* for the changes to take affect.

18.2.8.1.2 Validate the System

Verify URLs to ensure that the appropriate routing and failover are working.

To verify the URLs:

1. Log in to the domain's Oracle WebLogic Server Administration Console and stop all the instances of *SCALED_UP_MGD_SERVER* currently running in *SCALED_UP_HOST*, *PROVISIONED_HOST*, and *SCALED_OUT_HOST*, where applicable. (Also stop *SCALED_UP_MGD_SERVER_n* that are just added.)
2. Do the following:
    a. Edit the `FusionVirtualHost_`*domain*`.conf` file where *domain* takes the value of `fs` (Common domain), `crm`, `fin`, `hcm`, `ic`, `scm`, and so on, depending on the domain used.

If the *SCALED_UP_HOST*'s host and port do not already exist in the *SCALED_UP_MGT_SERVER* entry, complete Steps b and c. Otherwise, skip to Step 3.

b. Locate the name (in lower case) of the scaled-up Managed Server in the file. Add the value *SCALED_UP_HOST*:port to the WebLogicCluster property. Note that there are two parts, internal and external, in the FusionVirtualHost_*domain*.conf file on *WEBHOST*. The *SCALED_UP_HOST*:port must be added to both the internal and external parts. If scaling out web tier to *WEBHOST2* and others, do the same on these hosts as well.

   The following is an example of scaling up the HomePage Managed Server, and what the *SCALED_UP_HOST*:port looks like in the <Location> xml element in the FusionVirtualHost_fs.conf file

```
<Location /homepage>
   SetHandler weblogic-handler
   WebLogicCluster <PROVISIONED_HOST:port>,<SCALED_UP_HOST:port>,
   <SCALED_OUT_HOST:port>
   WLProxySSL ON
   WLProxySSLPassThrough ON
   RewriteEngine On
   RewriteOptions inherit
</Location>
```

c. Restart Oracle HTTP Server on both *WEBHOST1* and all other web-tier hosts, where applicable.

3. Log in to the domain's Oracle WebLogic Server Administration Console and start the *SCALED_UP_MGD_SERVER_n* Managed Server. Begin with n=1.
4. Access the URL of the application deployed to the *SCALED_UP_MGD_SERVER* from a different machine to verify that routing and failover are functioning properly.

   Close all browser windows then open a new one to ensure that the Oracle Fusion Applications login window displays correctly. The URL for the HomePage Managed Server for example, is:

   https://*domain*external.mycompany.com/homePage/faces/AtkHomePageWelcome
5. Log in to the domain's Oracle WebLogic Server Administration Console and stop the *SCALED_UP_MGD_SERVER_n* Managed Server started in Step 3.
6. Repeat Steps 3 through 5 for the other instances of the *SCALED_UP_MGD_SERVER*.
7. After completing validation, start all instances of *SCALED_UP_MGD_SERVER*.

18.2.8.2 Scale Up Oracle SOA Suite Server to an Existing Host

Before performing the procedures in this section, ensure that CommonDomain and its Managed Servers are running.

18.2.8.2.1 Clone Managed Servers and Assigning Them to SCALED_UP_HOST

To add a Managed Server and assign it to *SCALED_UP_HOST*:

1. Log in to the Administration Server: http://*domain_name*internal.mycompany.com/console.
2. Navigate to ***Domain_Name***, **Environment**, **Servers**.
3. Switch to **Lock & Edit** mode.

4. Select the ***Managed_Servers*** checkbox (for example, **soa_server1**) and then click **Clone**.
5. Specify the following Server Identity attributes:
   - Server Name - `soa_server`*`n`*

     To ensure consistency in naming, copy the name of the server shown in **Server Identity** and paste it into the **Server Name** field. Increase the total number of instances of `soa_server` in this domain by one and use that number to replace *n* at the end of the server name. Oracle recommends following the Oracle SOA Suite server naming convention `soa_server`*`n`*.
   - Server Listen Address - <*SCALED_UP_HOST*>
   - Server Listen Port - Give an unused port on the machine *SCALED_UP_HOST*
6. Click **OK**.
7. Navigate back to ***Domain_Name***. See the newly cloned SOA server, `soa_server`*`n`*.
8. Do the following:
   a. Click **soa_server*n***.
   b. From the **General** tab, select **Advanced** and then select the **WebLogic Plug-In Enabled** checkbox.
9. Click **Save** and then **Activate Changes**.
10. Run the newly created Managed Servers:
    a. Navigate to ***Domain_Name***.
    b. From the **Navigation** pane on the Oracle WebLogic Server console, select **Activate Changes**.
    c. Navigate to ***Domain_Name***.
    d. Check the newly created Managed Servers and click **Start**.
    e. Navigate to ***Domain_Name*** and check the **State** to verify that the newly created Managed Servers are running.
11. Log in to the Administration Server once again (`http://`*`domain_name`*`internal.mycompany.com/console`) and verify that all the Managed Servers, including scaled-up servers, are running.
12. Do the following:
    a. Switch to **Lock & Edit** mode.
    b. Select the ***Managed_Server*** checkbox (for example, **soa_server*n***).
    c. Select the **Server Start** tab.
    d. Change the Arguments to reflect the name of the cloned Managed Server and make sure the server group is the correct cluster name. For example, the following should be seen:

       ```
       -DJDBCProgramName\=DS/CommonDomain/soa_servern
       -Dserver.group\=SOACluster
       ```

    e. Click **Save**.
13. Select the **Logging** tab, and then select the **HTTP** tab.

14. Do the following:
    a. Change the Log file name to `logs/access.log.%yyyyMMdd%`.
    b. Change the rotation type to **By Time**.
    c. Leave the **Limit number of retained files** option unchecked.
    d. Leave the **Rotate log file on startup** option unchecked.
    e. Click **Save**.
    f. Expand **Advanced**.
    g. Change the format to **Extended**.
    h. Change the extended logging format fields to the following:

```
date time time-taken cs-method cs-uri
sc-status sc(X-ORACLE-DMS-ECID)
cs(ECID-Context) cs(Proxy-Remote-User)
cs(Proxy-Client-IP)
```

    i. Click **Save**.
15. Click **Activate Changes**.
16. Restart the Managed Server for the changes to take affect.

18.2.8.2.2 Validate the System

Verify URLs to ensure that the appropriate routing and failover is working from Oracle HTTP Server to the domain's SOACluster.

To verify the URLs:

1. Log in to the domain's Oracle WebLogic Server Administration Console and stop all the instances of `soa_server` currently running in *`SCALED_UP_HOST`*, *`PROVISIONED_HOST`*, and *`SCALED_OUT_HOST`*, where applicable. (Also stop `soa_server`*n* that are just added.)
2. Do the following:
    a. Edit the `FusionVirtualHost_`*`domain`*`.conf` file where *`domain`* takes the value of `fs` (Common domain), `crm`, `fin`, `hcm`, `ic`, `scm`, and so on, depending on the domain used.

       If the *`SCALED_UP_HOST`*'s host and port do not already exist in the `/soa/composer` entry, complete Steps b and c. Otherwise, skip to Step 3.

    b. Locate `/soa/composer` in the file. Add the value *`SCALED_UP_HOST`*`:port` to the WebLogicCluster property. Note that there are two parts, internal and external, in the `FusionVirtualHost_`*`domain`*`.conf` file on *`WEBHOST`*. The *`SCALED_UP_HOST`*`:port` must be added to both the internal and external parts. If scaling out web tier to *`WEBHOST2`* and others, do the same on these hosts as well.

       The following is an example of scaling up the `HomePage` Managed Server, and what the *`SCALED_UP_HOST`*`:port` looks like in the `<Location> xml` element in the `FusionVirtualHost_fs.conf` file

```
<Location /homepage>
   SetHandler weblogic-handler
   WebLogicCluster <DOMAINHOSTSOAVH1:port>, <DOMAINHOSTSOAVH2:port>
   WLProxySSL ON
```

```
    WLProxySSLPassThrough ON
    RewriteEngine On
    RewriteOptions inherit
</Location>
```

c. Restart Oracle HTTP Server on both *WEBHOST1* and all other web-tier hosts, where applicable.

3. Log in to the domain's Oracle WebLogic Server Administration Console and start the soa_server*n* Managed Server. Begin with n=1.
4. Access the URL http://*domain_name*internal.mycompany.com/soa-infra to verify that routing and failover are functioning properly.

   Close all browser windows then open a new one to ensure that the Oracle Fusion Applications login window displays correctly.
5. Log in to the domain's Oracle WebLogic Server Administration Console and stop the soa_server*n* Managed Server started in Step 3.
6. Repeat Steps 3 through 5 for the other instances of the soa_server*n* .
7. After completing validation, start all instances of soa_server*n*.

18.2.8.3 Scale Up Oracle Business Intelligence to an Existing Host

The procedure in this section allows to increase the number of instances of system components, such as Oracle Business Intelligence server, Oracle Business Intelligence Presentation Services server, and Oracle Business Intelligence Java host, on *SCALED_UP_HOST*. (Note that it is not necessary to run multiple Oracle Business Intelligence servers on *SCALED_UP_HOST*.)

Before performing the procedure, ensure that BIDomain and its Managed Server and system components are running in an existing host (referred to as *SCALED_UP_HOST*), where it is either a *PROVISIONED_HOST* or *SCALED_OUT_HOST*.

18.2.8.3.1 Scale-Up Procedure for Oracle Business Intelligence

To scale up Oracle Business Intelligence on *SCALED_UP_HOST*:

1. Log in to Fusion Middleware Control: http://biinternal.mycompany.com/em.
2. Expand the **Business Intelligence** node in the Farm_BIDomain window.
3. Click **coreapplication**.
4. Click **Capacity Management**, then click **Scalability**.
5. Click **Lock & Edit** and then change the number of BI Servers, Presentation Servers, or Java Hosts using the arrow keys.

   To avoid port conflicts for the system components being scaled within the given Oracle WebLogic Server instance, enter a different range of available ports in the **Port Range From** and **Port Range To** fields. For example, change **Port Range From** to 10221 and **Port Range To** to 10300.
6. Click **Apply**, then click **Activate Changes**.
7. Click **Restart** to apply recent changes.
8. Click **Restart** under **Manage System**.
9. Click **Yes** in the confirmation dialog.

18.2.9 Procedures for Scaling Out Oracle SOA Suite Server

This section describes the additional scale-out steps required for the `soa_server1` and `soa_server2` servers on *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`*.

The Oracle SOA Suite server uses the Java Message Service (JMS) server. JMS requires a shared file system for its file store and transactional log. Each Oracle SOA Suite Managed Server in a cluster uses a separate file on the shared folder. During a node failure, the Oracle SOA Suite server must be moved to a targeted node to run the same server using the exact JMS file store and transaction log. To enable this server migration, each Oracle SOA Suite server must be configured with its own virtual IP, which can be floated on any server where the Oracle SOA Suite server is migrated.

For Java Database Connectivity (JDBC), each Oracle SOA Suite Managed Server in a cluster uses a dedicated table per server on a database using the shared data source connection. During a node failure, the Oracle SOA Suite server must be moved to a targeted node to run the same server using the exact JDBC store and transaction log.

Perform the procedures in this section for the Oracle SOA Suite servers in all domains except the BIDomain, which has no Oracle SOA Suite servers.

For Oracle Fusion Applications, the Oracle SOA Suite virtual IPs *`PROVISIONED_HOST`* and *`SCALED_OUT_HOST`* are called *`DOMAINHOSTSOAVH1`* and *`DOMAINHOSTSOAVH2`*.

where

`DOMAIN` is replaced with the domain-specific syntax. For example, *`CRMSOAVH1`*, *`CRMSOAVH2`*, *`FINSOAVH1`*, *`HCMSOAVH1`*, *`ICSOAVH1`*, *`PROJSOAVH1`*, and so on.

18.2.9.1 Scale Out the Oracle SOA Suite Server

When scaling out the Oracle SOA Suite server, add new Managed Servers configured to new nodes.

18.2.9.1.1 Prerequisites for Scaling Out the Topology for Oracle SOA Suite Server

Before beginning, ensure the following:

- *`SCALED_OUT_HOST`* Node Manager has been started in the Secure Sockets Layer (SSL) mode
- Start with a clean machine if it is the first time it is being used for a scale out
- The UNIX `/etc/hosts` file has proper entries. To verify this from the clean machine, ping the hosts listed in `/etc/hosts` files with the fully qualified name of the hosts.
- The user created on *`SCALED_OUT_HOST`* should the same as the user on *`PROVISIONED_HOST`*
- The directory structure *`APPLICATIONS_BASE`* is mounted on *`SCALED_OUT_HOST`*, and is the same shared file system as used by *`PROVISIONED_HOST`*
- The directory structure *`APPLICATIONS_CONFIG`* on *`SCALED_OUT_HOST`* has been created
- The initial deployment on *`PROVISIONED_HOST`* has already been done and verified by provisioning

18.2.9.1.2 Add a New Machine in the Oracle WebLogic Server Console

To add a new machine:

1. Stop the domain's Administration Server:

   UNIX:

   ```
   PROVISIONED_HOST> APPLICATIONS_CONFIG/domains/PROVISIONED_HOST/
   CommonDomain/bin/stopWebLogic.sh
   ```

2. Set the following variable on *SCALED_OUT_HOST*.

   UNIX:

   ```
   WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=
   APPLICATIONS_BASE/fusionapps/wlserver_10.3/server/lib/fusion_trust.jks"
   ```

3. Start the domain's Administration Server on *SCALED_OUT_HOST*.

   UNIX:

   ```
   SCALED_OUT_HOST> APPLICATIONS_BASE/fusionapps/wlserver_10.3/common/bin/
   wlst.sh

   SCALED_OUT_HOST> nmConnect(username='username', password='password',
   domainName='domain_nameDomain', host='PROVISIONED_HOST',port='5556',
   nmType='ssl', domainDir='APPLICATIONS_CONFIG/domains/
   PROVISIONED_HOST/'domain_nameDomain')

   SCALED_OUT_HOST> nmStart('AdminServer')
   ```

   The *username* and *password* used in the `nmConnect` are the Node Manager credentials (username and password) specified when creating the provisioning response file.

4. Log in to the Administration Server: `http://domain_nameinternal.mycompany.com/console`.

5. Navigate to ***Domain_Name***, **Environment**, **Machines**.

   LocalMachine is located in the right-hand pane.

6. In the left-hand pane, click **Lock & Edit**.

7. In the right-hand pane, first click **New** to add the remote machine, and then specify the following:

   - Name - enter *SCALED_OUT_HOST*
   - Machine operating system - in UNIX: Unix

8. Click **Next**.

9. In the window that opens, set the following attributes:

   - Type - SSL
   - Listen Address - <*SCALED_OUT_HOST*>

     WARNING: The "localhost" default value here is wrong.

   - Listen port - 5556

10. Click **Finish** and activate the changes.

18.2.9.1.3 Pack and Unpack the Managed Server Domain Home

Since the *PROVISIONED_HOST* domain directory file system is also available from *SCALED_OUT_HOST*, both the `pack` and `unpack` commands can be executed from the *SCALED_OUT_HOST*.

To pack and unpack the Managed Server domain home:

1. Change directory to *APPLICATIONS_BASE*`/fusionapps/oracle_common/common/bin`.
2. Run the `pack` command

   UNIX:

   ```
   SCALED_OUT_HOST> ./pack.sh -managed=true -domain=APPLICATIONS_CONFIG/
   domains/
   SCALED_OUT_HOST/domain_nameDomain -template=APPLICATIONS_BASE/
   user_templates/
   domain_nameDomain_managed.jar -template_name="domain_name_Managed_Server_
   Domain"
   ```

3. Run the `unpack` command.

   UNIX:

   ```
   SCALED_OUT_HOST> ./unpack.sh -domain=APPLICATIONS_CONFIG/domains/
   SCALED_OUT_HOST/domain_nameDomain -template=APPLICATIONS_BASE/
   user_templates/
   Managed_Server_Domain.jar
   ```

   Here, *APPLICATIONS_BASE* is shared. If local applications config is enabled, replace *APPLICATIONS_CONFIG* with *APPLICATIONS_LOCAL_CONFIG*, which is local to *SCALED_OUT_HOST*.

18.2.9.1.4 Clone Managed Servers and Assign Them to SCALED_OUT_HOST

To add a Managed Server and assign it to *SCALED_OUT_HOST*:

1. Log in to the Administration Server: `http://`*domain_name*`internal.mycompany.com/console`.
2. Navigate to ***Domain_Name***, **Environment**, **Servers**.
3. Switch to **Lock & Edit** mode.
4. Select the ***Managed_Server*** checkbox (for example, **soa_server1**) and then click **Clone**.
5. Specify the following Server Identity attributes:
   - Server Name - `soa_server3`

     To ensure consistency in naming, copy the name of the server shown in **Server Identity** and paste it into the **Server Name** field. Then change the number to "3".
   - Server Listen Address - <*SCALED_OUT_HOST*>
   - Server Listen Port - leave "as is"
6. Click **OK**.

7. Navigate back to ***Domain_Name***, **Environment**, **Servers**. See the newly cloned server, `soa_server3`.
8. Click **soa_server3** and change the following attributes:
   - Machine - *<SCALED_OUT_HOST>*
   - Cluster Name - accept the default, SOACluster

     Ensure that this cluster name is the same as the cluster name of the original Managed Server.
9. From **soa_server3**, click **Advanced** and then select the **WebLogic Plug-In Enabled** checkbox.
10. Click **Save**.
11. Select the **Keystores** tab, and then ensure that the keystores value is **Custom Identity and Custom Trust**.
12. Do the following:
    a. Change the Custom Identity Keystore path to point to the *APPLICATIONS_BASE*`/fusionapps/wlserver_10.3/server/lib/`*SCALED_OUT_HOST*`_fusion_identity.jks` file.
    b. Leave the Custom Identity Keystore type blank.
    c. Change the Custom Identity Keystore Passphrase entry. This should be the same as the *keystorepassword* field described in the first bullet in Step 4 in Create the Identity Keystore on SCALED_OUT_HOST (page 18-10).
    d. Re-enter the Confirm Custom Identity Keystore Passphrase.
    e. Ensure that the Confirm Custom Trust Keystore path is pointing to the *APPLICATIONS_BASE*`/fusionapps/wlserver_10.3/server/lib/fusion_trust.jks` file.
    f. Leave the Custom Trust Keystore type blank.
    g. Change the Custom Trust Keystore Passphrase entry. This should be the same as the *keystorepassword* field described in the first bullet in Step 4 in Creating the Identity Keystore on SCALED_OUT_HOST (page 18-10).
    h. Re-enter the Custom Trust Keystore Passphrase.
    i. Click **Save**.
13. Select the **SSL** tab.
    a. Make sure that Identity and Trust Locations is set to **Keystores**.
    b. Change the Private Key Alias to *SCALED_OUT_HOST*`_fusion`.
    c. Change the Private Key Passphrase to the *keypassword*, as described in the second bullet in Step 4 in Creating the Identity Keystore on SCALED_OUT_HOST (page 18-10).
    d. Re-enter the *keypassword* from Step c for the Confirm Private Key Passphrase.
    e. Click **Save**.
14. Select the **Server Start** tab.

Change the Arguments to reflect the name of the cloned Managed Server and make sure the server group is the correct cluster name. For example, the following should be seen:

```
-DJDBCProgramName\=DS/domain_nameDomain/soa_server3
-Dserver.group\=SOACluster
```

Click **Save**.

15. Select the **Logging** tab, and then select the **HTTP** tab.
16. Do the following:
    a. Change the Log file name to `logs/access.log.%yyyyMMdd%`.
    b. Change the rotation type to **By Time**.
    c. Leave the **Limit number of retained files** option unchecked.
    d. Leave the **Rotate log file on startup** option unchecked.
    e. Click **Save**.
    f. Expand **Advanced**.
    g. Change the format to **Extended**.
    h. Change the extended logging format fields to the following:

    ```
    date time time-taken cs-method cs-uri
    sc-status sc(X-ORACLE-DMS-ECID)
    cs(ECID-Context) cs(Proxy-Remote-User)
    cs(Proxy-Client-IP)
    ```

    i. Click **Save**.
17. Click **Activate Changes**.
18. Run the newly created Managed Server:
    a. Navigate to ***Domain_Name***, **Environment**.
    b. From the **Navigation** pane on the Oracle WebLogic Server console, select **Activate Changes**.
    c. Navigate to ***Domain_Name***, **Environment**, **Servers**, **Control**.
    d. Check the newly created Managed Server and click **Start**.
    e. Navigate to ***Domain_Name***, **Environment**, **Servers**, and check the **State** to verify that the newly created Managed Servers are running.

18.2.9.1.5 Validate the System

Verify URLs to ensure that the appropriate routing and failover is working from Oracle HTTP Server to the domain's SOACluster.

To verify the URLs:

1. Log in to the domain's Oracle WebLogic Server Administration Console and stop the `soa_server1` Managed Server on *`PROVISIONED_HOST`* while the Managed Servers on *`SCALED_OUT_HOST`* are running.
2. Do the following:

a. Edit the `FusionVirtualHost` file, adding the scaled-out `soa_server3` Managed Server's host and port.

b. Add the code shown in the following example to both the Internal and External part of the `FusionVirtualHost` file on *`WEBHOST1`* and *`WEBHOST2`*.

```
<Location /soa/composer>
   SetHandler weblogic-handler
   WebLogicCluster <DOMAINHOSTSOAVH1:port>,<DOMAINHOSTSOAVH2:port>,
   WLProxySSL ON
   WLProxySSLPassThrough ON
   RewriteEngine On
   RewriteOptions inherit
</Location>
```

c. Restart Oracle HTTP Server on both *`WEBHOST1`* and *`WEBHOST2`*.

3. Access `http://`*`domain_name`*`internal.mycompany.com/soa-infra` to verify that routing and failover are functioning properly. (Ensure the log in prompt is visible.)
4. Log in to the domain's Oracle WebLogic Server Administration Console and stop the `soa_server3` Managed Server on *`SCALED_OUT_HOST`*.
5. Start the `soa_server1` Managed Server on *`PROVISIONED_HOST`*.
6. Repeat Step 3. (Ensure the log in prompt is visible.)
7. Start the `soa_server3` Managed Server on *`SCALED_OUT_HOST`* and verify that `soa_server1` and `soa_server3` are running.

18.2.9.2 Enable Virtual IPs on PROVISIONED_HOST and SCALED_OUT_HOST

In this example, `ethX` is the ethernet interface (`eth0` or `eth1`) and `Y` is the index (0, 1, 2, and so on). In addition, the *`DOMAINHOSTSOAVH1`* and *`DOMAINHOSTSOAVH2`* VIPs are used.

To enable the virtual IP on Linux:

1. On *`PROVISIONED_HOST`*:

a. (UNIX) Run the `ifconfig` command as root:

```
/sbin/ifconfig interface:index IPAddress netmask netmask
```

For example:

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

b. (UNIX only) Enable the network to register the new location of the virtual IP:

```
/sbin/arping -q -U -c 3 -I interface IPAddress
```

For example:

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

c. Validate that the address is available by pinging it from another node. For example:

UNIX:

```
/bin/ping 100.200.140.206
```

2. Repeat Steps 1.a (page 18-74) through 1.c (page 18-74) on *`SCALED_OUT_HOST`*.

18.2.9.3 Set the Listen Address for soa_server*n*

Ensure to have performed the steps described in Enable Virtual IPs on PROVISIONED_HOST and SCALED_OUT_HOST (page 18-74), and the scale-out steps described in Add a New Machine In the Oracle WebLogic Server Console (page 18-12), Pack and Unpack the Managed Server Domain Home to SCALED_OUT_HOST (page 18-13), and Clone Managed Servers and Assign Them to SCALED_OUT_HOST (page 18-14) before setting the `soa_server`*`n`* listen address.

To set the listen address for the Managed Server:

1. Log in to the Administration Console.
2. In the Change Center, click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Select **soa_server*n*** in the table. The Setting page for `soa_server`*`n`* is displayed.
6. Set the **Listen Address** to *`DOMAINHOSTSOAVH1`*.
7. Click **Save**.
8. Click **Activate Changes**.
9. The changes do not take effect until the `soa_server`*`n`* Managed Server is restarted (ensure that Node Manager is up and running):
    a. On the Summary of Servers page, select the **Control** tab.
    b. Select **soa_server*n*** in the table and then click **Shutdown**.
    c. After the server has shut down, select **soa_server*n*** in the table and then click **Start**.

18.2.9.4 Update the FusionVirtualHost Configuration File

To enable Oracle HTTP Server to route to `soa_cluster`, which contains the `soa_server`*`n`* Managed Servers, set the WebLogicCluster parameter to the list of nodes in the cluster.

The `FusionVirtualHost` configuration file uses specific file-naming conventions. For information about these conventions, see Table 18-1 (page 18-16) in Configure Oracle HTTP Server (page 18-16).

To set the parameter:

1. Update the WebLogicCluster parameter in the `FusionVirtualHost` configuration file to contain a cluster list of virtual *`host`*:*`port`* entries. (On *`WEBHOST1`*: *`APPLICATIONS_CONFIG`*`/CommonDomain_webtier/config/OHS/ohs1/moduleconf/FusionVirtualHost_`*`domain`*`.conf`. On *`WEBHOST2`*: *`APPLICATIONS_CONFIG`*`/CommonDomain_webtier1/config/OHS/ohs2/moduleconf/FusionVirtualHost_`*`domain`*`.conf`.) For example:

```
<Location /soa-infra>
 SetHandler weblogic-handler
 WebLogicCluster DOMAINHOSTSOAVH1:7416,DOMAINHOSTSOAVH2:7416
</Location>
```

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

```
WEBHOST1> APPLICATIONS_CONFIG/CommonDomain_webtier/bin/opmnctl
restartproc
ias-component=ohs1

WEBHOST2> APPLICATIONS_CONFIG/CommonDomain_webtier1/bin/opmnctl
restartproc
ias-component=ohs2
```

The servers specified in the WebLogicCluster parameters are only important at startup time for the plug-in. The list must provide at least one running cluster member for the plug-in to discover other members in the cluster. 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 include the following:

- **Example 1:** If there is a two-node cluster and add a third member is added, it is not necessary to update the configuration to add the third member. The third member will be discovered dynamically at runtime.
- **Example 2:** There is a three-node cluster, but only two nodes are listed in the configuration. However, if both listed nodes are down when Oracle HTTP Server is started, then the plug-in would fail to route to the cluster. Ensure that at least one of the listed nodes is running when Oracle HTTP Server is started.

If all the members of the cluster are listed, then guarantee it is possible to route to the cluster, assuming at least one member is running when Oracle HTTP Server is started. For more information on configuring the Oracle WebLogic Server plug-in, see Overview of Oracle WebLogic Server Proxy Plug-In in the *Oracle Fusion Middleware Using Oracle WebLogic Server Proxy Plug-Ins 12.2.1.2* guide.

18.2.9.5 Switch Oracle User Messaging Service to Use Oracle Advanced Queuing

After *PROVISIONED_HOST* has been provisioned, Oracle User Messaging Service is fully configured with `UMSAQJMSForeignServer` in the `UMSAQJMSSystemResource` JMS Module, and the Oracle Advanced Queuing (AQ-JMS) Foreign Server is deployed over the Oracle SOA Suite Cluster.

No additional JMS configuration is required for the scaled-out server host.

Although `UMSJMSServer_auto_1` is configured with the `UMSJMSFileStore_auto_1` file persistence deployed over the `soa_server1` Managed Server, they are not being used by Oracle Fusion Applications.

18.2.9.6 Configure JMS Servers with JDBC Store Persistence

After *PROVISIONED_HOST* has been provisioned, the Java Message Service (JMS) servers are set up and configured and Java Database Connectivity (JDBC) stores are created and fully configured for *PROVISIONED_HOST*. Create and configure now the JMS servers and JDBC stores for *SCALED_OUT_HOST_HOST*.

Do the following to create and configure the JMS servers and JDBC stores for *SCALED_OUT_HOST*:

1. Log in to the Oracle WebLogic Server Administration Console.
2. Click **Lock & Edit**.
3. In the Domain Structure window, expand the **Services** node and then click the **Persistence Stores** node.

   The Summary of Persistence Stores page appears.
4. Click **New**, and then **Create JDBC Store**.
5. In the file store fields, enter the following:
   - Name: for example, `SOAJMSJDBCStore_2`
   - Target: `soa_server2`
   - Data Source: `SOALocalTxDataSource`
   - Prefix Name: *`DOMAIN`*`_FUSION_SOAINFRA.SOAJMS_2_`. (Do not forget to include the ending "_".)
6. Click **OK**.
7. Repeat Steps 3 (page 18-77) through 6 (page 18-77) for the remaining the three remaining JDBC stores, using the same target and data-source field values:
   - `AGJMSJDBCStore_2`
   - `BPMJMSJDBCStore_2`
   - `PS6SOAJMSJDBCStore_2`
8. Click **Activate Changes**.
9. Click **Lock & Edit**.
10. In the Domain Structure window, expand the **Services** node and then click the **Messaging**, **JMS Servers** node.

    The Summary of Summary of JMS Servers page appears.
11. Click **New**.
12. Enter a name (for example, `SOAJMSServer_2`), then select **SSOAJMSJDBCStore_2** in the Persistence Store dropdown list.
13. Click **Next**.
14. Select **soa_server2** as the target.
15. Click **Finish**.
16. Repeat Steps 10 (page 18-77) through 15 (page 18-77) for the remaining JMS servers:
    - `AGJMSServer_2`
    - `BPMJMSServer_2`
    - `PS6SOAJMSServer_2`
17. Click **Activate Changes**.
18. Click **Lock & Edit**.
19. In the Domain Structure window, expand the **Services** node and then click the **Messaging > JMS Modules** node.

    The JMS Modules page appears.

20. Click **SOAJMSModule** and then click the **Subdeployments** tab.
21. Click **SOAJMSServer*xxxxx*** under **Subdeployments**.
22. Add the new `SOAJMSServer_2` server as an additional target for the subdeployment.
23. Click **Save**.
24. Repeat Steps 19 (page 18-77) through 23 (page 18-78) for the `BPMJMSModule` JMS module.

    WARNING: Do not make any changes to these JMS modules:

    - `ADSJMSAQModule`
    - `JRFWSAsyncJmsModuleAQ`
    - `AGJMSModule`
    - `PS6SOAJMSModule`
25. Click **Activate Changes**.

18.2.9.7 Configure 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 to disable multicast communication for security reasons.

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 configuration described in this section.

Multicast communication enables Oracle Fusion Middleware SOA to discover all of the members of a cluster to which it deploys composites dynamically. However, unicast communication does not enable nodes to discover other cluster members in this way. Consequently, specify the nodes that belong to the cluster. It is not necessary to specify all of the nodes of a cluster, however. It is only necessary to specify enough nodes so that a new node added to the cluster can discover one of the existing nodes. Consequently, 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, 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 the number for each Oracle HTTP Server. The numbering starts 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 (*`DOMAINHOSTSOAVH1`* and *`DOMAINHOSTSOAVH2`*).

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.

`DOMAINHOSTSOAVH1` is the virtual host name that maps to the virtual IP where `soa_server1` is listening (in *`PROVISIONED_HOST`*). *`DOMAINHOSTSOAVH2`* is the virtual host name that maps to the virtual IP where `soa_server2` is listening (in *`SCALED_OUT_HOST`*).

To add the host name used by Oracle Coherence:

1. Log in to 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. Select **soa_server1** (represented as a hyperlink) from the column of the table.

   The Settings page appears.
5. Click **Lock & Edit**.
6. Click the **Server Start** tab.
7. Append the following for `soa_server1` and `soa_server2` to the **Arguments** field.

   For `soa_server1`:

   ```
   -Dtangosol.coherence.wka1=DOMAINHOSTSOAVH1
   -Dtangosol.coherence.wka2=DOMAINHOSTSOAVH2
   -Dtangosol.coherence.localhost=DOMAINHOSTSOAVH1
   -Dtangosol.coherence.localport=8089
   -Dtangosol.coherence.wka1.port=8089
   -Dtangosol.coherence.wka2.port=8089
   ```

   For `soa_server2`:

   ```
   -Dtangosol.coherence.wka1=DOMAINHOSTSOAVH2
   -Dtangosol.coherence.wka2=DOMAINHOSTSOAVH1
   -Dtangosol.coherence.localhost=DOMAINHOSTSOAVH2
   -Dtangosol.coherence.localport=8089
   -Dtangosol.coherence.wka1.port=8089
   -Dtangosol.coherence.wka2.port=8089
   ```

   WARNING: There should be no breaks in lines between the different `-D` parameters. Do not copy or paste the code from above to the Administration Console's Arguments text field. This may result in HTML tags being inserted in the Java arguments. The code should not contain other characters than those included in the example above.
8. Click **Save** and **Activate Changes**.

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.

By default, the Oracle Coherence cluster uses port 8088 for deployment. This port can be changed by specifying the `-Dtangosol.coherence.wkaX.port` startup parameter. To avoid a port number conflict when configuring coherence parameters in different domains, ensure that port 8089 increments by 1, or choose the next free port in this sequence.

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

18.2.9.8 Configure a JDBC Transaction Log 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. Oracle WebLogic Server uses this transaction log for recovery from system crashes or network failures. To leverage the migration capability of the Transaction Recovery Service for the servers within a cluster, store the transaction log in a location accessible to a server and its backup servers.

To set the location for the transaction log store:

1. Log in to the Oracle WebLogic Server Administration Console (`http://`*`domain_name`*`internal.mycompany.com/console`).
2. In the Change Center, click **Lock & Edit**.
3. In the Domain Structure window, expand the **Environment** node and then click the **Servers** node.

   The Summary of Servers page appears.
4. Click the server name **soa_server2** (represented as a hyperlink) in the table. The Settings page for the selected server appears, and defaults to the **Configuration** tab.
5. In the **Configuration** tab, click the **Services** tab.
6. In the **Transaction Log Store** section of the page, do the following:
   a. For the type, change the dropdown list selection from **Default Store** to **JDBC**.
   b. For the data store, select **SOALocalTxDataSource** from dropdown list.
   c. For prefix name, enter *`DOMAIN`*`_FUSION_SOAINFRA.TLOG_soa_server2_`. (Do not forget to include the ending "_".)

      The prefix name is specific for each domain.

      - Oracle Fusion Customer Relationship Management domain: `CRM_FUSION_SOAINFRA.TLOG_soa_server2_`
      - Oracle Fusion Financials domain: `FIN_FUSION_SOAINFRA.TLOG_soa_server2_`
      - Oracle Fusion Common domain: `SETUP_FUSION_SOAINFRA.TLOG_soa_server2_`
      - Oracle Fusion Incentive Compensation domain: `OIC_FUSION_SOAINFRA.TLOG_soa_server2_`
      - Oracle Fusion Human Capital Management domain: `HCM_FUSION_SOAINFRA.TLOG_soa_server2_`
      - Oracle Fusion Supply Chain Management domain: `SCM_FUSION_SOAINFRA.TLOG_soa_server2_`

- Oracle Fusion Project Portfolio Management domain: `PRJ_FUSION_SOAINFRA.TLOG_soa_server2_`
- Oracle Fusion Procurement domain: `PRC_FUSION_SOAINFRA.TLOG_soa_server2_`

When the JDBC transaction log store configuration is complete, and after bouncing the `soa_server2` server, do the following:

- Append the table name in the prefix name with `WLStore`. For example, `TLOG_soa_server2_WLStore`.
- Verify that the new table, `TLOG_soa_server2_WLStore`, has been created in *`DOMAIN`*`_FUSION_SOAINFRA`.

7. Click **Save** and then click **Activate Changes**.
8. Restart the Managed Server to activate the changes (ensure that Node Manager is up and running):
   a. Log in to the Oracle WebLogic Server Administration Console (`http://`*`domain_name`*`internal.mycompany.com/console`).
   b. In the Summary of Servers screen, select the **Control** tab.
   c. Select **soa_server2** in the table and then click **Shutdown**.
   d. Start the `soa_server2` server.

18.2.9.9 Disable Host Name Verification for the soa_server*n* Managed Servers

This step is required if the appropriate certificates are not set up to authenticate the different nodes with the Administration Server. By default, Host Name Verification should be set to *None*. If it is not, follow the steps below.

If the server certificates have not been configured, errors are displayed during the management of the different Oracle WebLogic Servers. To avoid these errors, disable host name verification while setting up and validating the topology, and enable it again after the enterprise deployment topology configuration is complete.

To disable Host Name Verification:

1. Log in to Oracle WebLogic Server Administration Console. For example, `http://`*`domain_name`*`internal.mycompany.com/console`.
2. Click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**.

   The Summary of Servers page appears.
5. Select **soa_server*n*** (represented as a hyperlink) in 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 Steps 1 (page 18-81) through 9 (page 18-81) for the other instance of the `soa_server`*n* Managed Server.
11. Save and activate the changes.

18.2.9.10 Restart Node Manager on PROVISIONED_HOST

To restart Node Manager on *PROVISIONED_HOST*:

1. (UNIX only) 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 associated process and use the `kill` command to stop it. For example:

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

   c. Run the following command:

      ```
      PROVISIONED_HOST> kill -9 9139
      ```

2. Start Node Manager.

   UNIX:

   ```
   PROVISIONED_HOST> APPLICATIONS_CONFIG/nodemanager/PROVISIONED_HOST/
   startNodeManagerWrapper.sh
   ```

18.2.9.11 Start and Validate soa_server1 on PROVISIONED_HOST

To start the `soa_server1` Managed Server on *PROVISIONED_HOST*:

1. Access the Administration Console. For example, `http://`*domain_name*`internal.mycompany.com/console`.
2. Click **Servers**.
3. Open the **Control** tab.
4. Select **soa_server1**.
5. Click **Start**.

To validate the `soa_server1` Managed Server on *PROVISIONED_HOST*:

1. Verify that the server status is reported as *Running* in the Administration Console. If the server is shown as *Starting* or *Resuming*, wait for the server status to change to *Started*. If another status is reported (such as *Admin* or *Failed*), check the server output log files for errors.
2. Access `http://`*DOMAINHOSTSOAVH1*`:7416/soa-infra` and `http://`*domain_name*`internal.mycompany.com/soa-infra` to verify status of `soa_server1`.

   Although the `soa_server1` server may be up, some applications may be in a failed state. Therefore, Oracle recommends verifying the above URLs and watching for errors pertaining each individual application in the server's output file.

18.2.9.12 Restart Node Manager on SCALED_OUT_HOST

To restart Node Manager on *SCALED_OUT_HOST*, follow the steps in Restart Node Manager on PROVISIONED_HOST (page 18-82).

18.2.9.13 Start and Validate soa_server*n* on SCALED_OUT_HOST

To start the `soa_server`*n* Managed Server on *SCALED_OUT_HOST* and ensure that it is configured correctly:

1. From the Administration Console, start the `soa_server`*n* Managed Server.
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.
3. Access `http://`*DOMAINHOSTSOAVH2*`:7416/soa-infra` and `http://`*domain_name*`internal.mycompany.com/soa-infra`.

   Although `soa_server2` server may be up, some applications may be in a failed state. Therefore, Oracle recommends verifying the above URLs and watching for errors pertaining each individual application in the server's output file.

18.2.10 Configure Administration Server High Availability

This section describes how to configure and validate the Oracle WebLogic Server Administration Server for high availability.

The Administration Server is a singleton application, so it cannot be deployed in an active-active configuration. By default, the Administration Server is only available on the first installed node. If this node becomes unavailable, then the Administration Console and Fusion Middleware Control also become unavailable. To avoid this scenario, the Administration Server and the applications deployed to it must be enabled for failover. The enterprise deployment architecture in this guide calls for the deploying the Administration Server on a disk shared between the primary node and the secondary node.

The following domains are deployed as part of the Oracle Fusion Applications enterprise deployment implementation:

The list of domains may differ depending on the product offerings that are provisioned in the environment.

- Oracle Fusion Customer Relationship Management Domain
- Oracle Fusion Common Domain
- Oracle Fusion Financials Domain
- Oracle Fusion Human Capital Management Domain
- Oracle Fusion Supply Chain Management Domain
- Oracle Fusion Incentive Compensation Domain
- Oracle Fusion Project Portfolio Management Domain
- Oracle Fusion Procurement Domain
- Oracle Business Intelligence Domain

The process described in this section initially deploys each domain-specific Administration Server in shared storage (*APPLICATIONS_BASE*) mounted on *PROVISIONED_HOST*, and Managed Servers in the local disk (*APPLICATIONS_CONFIG*).

This section tells how to do the following:

- Enable an administrative virtual host on *PROVISIONED_HOST*
- Add a new machine in the Oracle WebLogic Server Console
- Enable the Administration Server to listen on the virtual IP address

18.2.10.1 Enable an Administrative Virtual Host on PROVISIONED_HOST

DOMAINADMINVH is used as a generic name in this section.

where

DOMAIN is replaced with the domain-specific syntax. For example, *CRMADMINVH*, *FINADMINVH*, *HCMADMINCH*, and so on.

The Administration Server must be configured to listen on a virtual IP Address to enable it to seamlessly failover from one host to another. In a failure, the Administration Server, along with the virtual IP Address, can be migrated from one host to another.

However, before the Administration Server can be configured to listen on a virtual IP Address, one of the network interface cards on the host running the Administration Server must be configured to listen on this virtual IP Address. The steps to enable a virtual IP Address are completely dependent on the operating system.

To enable a virtual IP Address on *PROVISIONED_HOST*:

In a UNIX environment, the command must be run as the root user.

1. **UNIX**: On *PROVISIONED_HOST*, run the `ifconfig` command to get the value of the netmask. In a UNIX environment, run this command as the root user. For example **Linux**:

   ```
   [root@PROVISIONED_HOST ~] # /sbin/ifconfig
   eth0 Link encap:Ethernet HWaddr 00:11:43:D7:5B:06
     inet addr:139.185.140.51 Bcast:139.185.140.255 Mask:255.255.255.0
     inet6 addr: fe80::211:43ff:fed7:5b06/64 Scope:Link
     UP BROADCAST RUNNING MULTICAST  MTU:1500 Metric:1
     RX packets:10626133 errors:0 dropped:0 overruns:0 frame:0
     TX packets:10951629 errors:0 dropped:0 overruns:0 carrier:0
     collisions:0 txqueuelen:1000
     RX bytes:4036851474 (3.7 GiB) TX bytes:2770209798 (2.5 GiB)
     Base address:0xecc0 Memory:dfae0000-dfb00000
   ```

   Solaris: On *PROVISIONED_HOST*, check `/etc/netmasks` to get the `netmask` value:

   ```
   cat /etc/netmasks
   ```

2. (UNIX) On *PROVISIONED_HOST*, bind the virtual IP Address to the network interface card using `ifconfig`. In a UNIX environment, run this command as the root user. Use a `netmask` value that was obtained in Step 1.

   (Linux) The syntax and usage for the `ifconfig` command is as follows:

   ```
   /sbin/ifconfig networkCardInterface Virtual_IP_Address netmask netMask
   ```

   For example:

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

(Solaris) The syntax and usage for the `ifconfig` command is as follows:

```
/sbin/ifconfig networkCardInterface Virtual_IP_Address netmask netMask
```

For example:

```
/sbin/ifconfig lo0 100.200.140.206 netmask 255.255.255.
```

3. (Linux only) Update the routing table using `arping`. In a UNIX environment, run this command as the root user.

   ```
   /sbin/arping -q -U -c 3 -I networkCardInterface Virtual_IP_Address
   ```

   For example:

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

4. Validate that the address is available by pinging it from another node. For example:

   Linux:

   ```
   /bin/ping 100.200.140.206
   ```

   Solaris:

   ```
   /usr/sbin/ping 100.200.140.206
   ```

18.2.10.2 Add a New Machine in the Oracle WebLogic Server Console

Create a new machine and assign the Administration Server to the new machine using the Administration Console:

1. Log in to the Administration Console.
2. In the Change Center, click **Lock & Edit**.
3. In the Environment section of the Home page, click **Machines**.
4. On the Summary of Machines page, select the machine that is associated with the Administration Server from under the **Machines** table and click **Clone**. For example: `PROVISIONED_HOST.MYCOMPANY.COM`.
5. On the Clone a Machine page, enter the name of the machine under the Machine Identity section and click **OK**. For example, enter `ADMINHOST` as the machine name.
6. On the Summary of Machines page, click the newly created machine link.
7. On the Settings page for the `ADMINHOST` machine, click **Servers**.
8. Click **Add** under the **Servers** table.
9. On the Add a Server to Machine page, select **Select an existing server, and associate it with this machine**.
10. Choose the AdminServer from the dropdown list.
11. Click **Finish** to associate the Administration Server with the machine.
12. On the Settings page for the `ADMINHOST` machine, click **Node Manager**.
13. Set the listen address to *`DOMAINADMINVH`*.

    Ensure that the steps described in Enable an Administrative Virtual Host on PROVISIONED_HOST (page 18-84) have been performed before setting the Node Manager listen address.

14. Click **Save**.
15. In the Change Center, click **Activate Changes**.

18.2.10.3 Enable an Administration Server to Listen on the Virtual IP Address

Ensure to have performed the steps described in Enable an Administrative Virtual Host on PROVISIONED_HOST (page 18-84) before setting the Administration Server listen address.

To set the Administration Server listen address:

1. Log in to the Administration Console.
2. In the Change Center, click **Lock & Edit**.
3. Expand the **Environment** node in the Domain Structure window.
4. Click **Servers**. The Summary of Servers page is displayed.
5. Select **AdminServer(admin)** in the table. The Settings page for AdminServer(admin) is displayed.
6. Set the listen address to *DOMAINADMINVH* (domain-specific administrative virtual host).
7. Click **Save**.
8. Click **Activate Changes**.
9. The changes will not take effect until the Administration Server is restarted. Follow these steps to restart the Administration Server:
   a. In the Summary of Servers page, select the **Control** tab.
   b. Select **AdminServer(admin)** in the table and then click **Shutdown**.
10. Set the following environment variable.

    UNIX:

    ```
    WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=
    APPLICATIONS_CONFIG/keystores/fusion_trust.jks"
    ```

11. Start the Administration Server again from the command line using the `nmconnect` user name and password.

    UNIX:

    ```
    PROVISIONED_HOST> APPLICATIONS_BASE/fusionapps/wlserver_10.3/common/bin/
    wlst.sh

    PROVISIONED_HOST> nmConnect(username='username', password='password',
    domainName='domain_name', host='DOMAINADMINVH',port='5556', nmType='ssl',
    domainDir='APPLICATIONS_CONFIG/domains/PROVISIONED_HOST/domain_name')

    PROVISIONED_HOST> nmStart('AdminServer')
    PROVISIONED_HOST> exit ()
    ```

18.2.10.4 Configure Oracle HTTP Server

To configure Oracle HTTP Server:

1. On *WEBHOST1*:

a. (UNIX) Change directory to *APPLICATIONS_CONFIG*/CommonDomain_webtier/config/OHS/ohs1/moduleconf.

b. Edit the domain-specific virtual host config file. For example:

   UNIX:

   ```
   cp FusionVirtualHost_domain.conf FusionVirtualHost_domain.conf.org
   ```

The FusionVirtualHost configuration file uses specific file-naming conventions. For information about these conventions, see Table 18-1 (page 18-16) in Configuring Oracle HTTP Server (page 18-16).

2. Edit the FusionVirtualHost configuration file, adding the Administrative virtual host and port. Example 18-2 (page 18-87) shows sample code.

   Replace *DOMAINADMINVH* and port with domain-specific Administrative virtual host and port number.

3. Restart Oracle HTTP Server:

   UNIX:

   Change directory to *APPLICATIONS_CONFIG*/CommonDomain_webtier/bin and enter the following:

   ```
   WEBHOST1> ./opmnctl stopall
   WEBHOST1> ./opmnctl startall
   ```

4. Repeat Steps 1 (page 18-86) through 3 (page 18-87) on *WEBHOST2*.

Example 18-2 Add AdministrativeVirtual Host and Port

```
## Context roots for application em
    <Location /em>
        SetHandler weblogic-handler
        WebLogicCluster DOMAINADMINVH:port
    </Location>

## Context roots for application console
    <Location /console >
        SetHandler weblogic-handler
        WebLogicCluster DOMAINADMINVH:port
    </Location>
```

18.2.10.5 Validate the Administration Server

Perform these steps to ensure that the Administration Server and Oracle Enterprise Manager Fusion Middleware Control are properly configured:

1. Ensure to have access the domain-specific Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control. For example:

   ```
   http://domain_nameinternal.mycompany.com/console
   ```

   ```
   http://domain_nameinternal.mycompany.com/em
   ```

2. After completing the steps in Configuring Administration Server High Availability (page 18-83) for other domains, repeat Step 1 (page 18-87) for other domains by replacing the domain-specific URL.

3. Do the following:

a. Log into Oracle Fusion Functional Setup Manager as a super user. The user should have the Oracle WebLogic Server Administrator role, for example, "FAadmin". Functional Setup Manager is located here:

   `https://commonexternal.mycompany.com/setup/faces/TaskListManagerTop`

b. Select **Register Domains** in the left-hand task pane.

c. On the Register Domains page, select the domain to be updated and click **Edit**.

d. Do the following:

   – Replace `ADMIN_HOST` (the default value) with *`DOMAINADMINVH`* wherever it appears.

   – Update the value of **Node Manager Protocol** to `ssl`.

   – Ensure the value of **Node Manager Port** is `5556`.

e. Click **Save and Close**.

f. Repeat Step 3.a (page 18-88) through Step 3.e (page 18-88) for all domains except IDMDomain.

4. Replace the value of `TAXONOMY_URL` in the `fusion_env.properties`, `fusion_prov.properties`, and `atgpf_env.properties` files located in *`APPLICATIONS_CONFIG`*`/fapatch` with *`DOMAINADMINVH`* if the Administration Server's listen address is updated with the virtual IP (VIP) for CommonDomain.

5. The changes do not take effect until the Administration Server is restarted. Follow these steps to restart the Administration Server:

   a. In the Summary of Servers page, select the **Control** tab.

   b. Select **AdminServer(admin)** in the table and then click **Shutdown**.

6. Set the following environment variable:

   UNIX:

   ```
   WLST_PROPERTIES="-Dweblogic.security.SSL.trustedCAKeyStore=
   APPLICATIONS_CONFIG/keystores/fusion_trust.jks"
   ```

7. Start the Administration Server again from the command line using the `nmconnect` user name and password.

   UNIX:

   ```
   PROVISIONED_HOST> APPLICATIONS_BASE/fusionapps/wlserver_10.3/common/bin/
   wlst.sh

   PROVISIONED_HOST> nmConnect(username='username', password='password',
   domainName='domain_name', host='DOMAINADMINVH',port='5556', nmType='ssl',
   domainDir='APPLICATIONS_CONFIG/domains/PROVISIONED_HOST/domain_name')

   PROVISIONED_HOST> nmStart('AdminServer')
   PROVISIONED_HOST> exit ()
   ```

8. Restart the Managed Servers:

   a. Log in to the Oracle WebLogic Server Administration Console (`http://`*`domain_name`*`internal.mycompany.com/console`).

   b. Navigate to ***Domain_Name*** **> Environment > Servers > Control**.

c. Select all the Managed Servers and click **Stop**.

d. After all the servers have shut down, select all the servers in the table and then click **Start**.

18.2.10.6 Manual Fail Over the Administration Server to SCALED_OUT_HOST

In case a node fails, fail over the Administration Server to another node. This section describes how to fail over the Administration Server from *PROVISIONED_HOST* to *SCALED_OUT_HOST*.

18.2.10.6.1 Prerequisites for the Manual Failover

Ensure the following:

- The Administration Server is configured to listen on a domain-specific administrative virtual host, and not on **any** address
- When failover happens, the Administration Server is failed over from *PROVISIONED_HOST* to *SCALED_OUT_HOST* and the two nodes have the following IPs:
  - *PROVISIONED_HOST*: 100.200.140.165
  - *SCALED_OUT_HOST*: 100.200.140.205
  - *DOMAINADMINVH*: 100.200.140.206. This is the VIP where the domain-specific Administration Server is running, assigned to `ethX:Y`, available in *PROVISIONED_HOST* and *SCALED_OUT_HOST*.
  - The domain directory where the Administration Server is running on *PROVISIONED_HOST* is on shared storage and is mounted from *SCALED_OUT_HOST*

18.2.10.6.2 Performing the Failover

The following procedure explains how to fail over the Administration Server to a different node (*SCALED_OUT_HOST*) with the Administration Server still using the same Oracle WebLogic Server machine. (This machine is a logical machine, not a physical one.)

To fail over the Administration Server:

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

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

   b. Run the following command as root on *SCALED_OUT_HOST*:

      SCALED_OUT_HOST`> /sbin/ifconfig` *interface:index IP_Address* `netmask` *netmask*

      For example:

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

Ensure that the netmask and interface to be used to match the available network configuration in *SCALED_OUT_HOST*.

3. Update the routing tables with arping. For example, run the following command as root:

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

4. Validate that the address is available by pinging it from another node. For example:

   ```
   /bin/ping 100.200.140.206
   ```

5. Start the Administration Server on *SCALED_OUT_HOST* using the procedure in Enable an Administration Server to Listen on the Virtual IP Address (page 18-86).

6. Test access to the Administration Server on *SCALED_OUT_HOST*:

   a. Ensure that it is possible to access the domain-specific Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control. For example, for the Oracle Fusion Customer Relationship Management domain, use these URLs:

      - `http://crminternal.mycompany.com/console`
      - `http://crminternal.mycompany.com/em`

   b. Repeat Step 6.a (page 18-90) for other domain by replacing the domain-specific URL.

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 *PROVISIONED_HOST*, and not the failover machine, *SCALED_OUT_HOST*. Since Node Manager does not monitor the Administration Server, the machine name that appears in the Current Machine field, is not relevant and can be ignored.

18.2.10.7 Fail the Administration Server Back to PROVISIONED_HOST

Ensure that the Oracle WebLogic Server Administration Server can be failed back, that is, stop it on *SCALED_OUT_HOST* and run it on *PROVISIONED_HOST*. To do this, migrate *DOMAINADMINVH* back to *PROVISIONED_HOST* node.

To migrate *DOMAINADMINVH*:

1. Stop the Administration Server on *SCALED_OUT_HOST*.
2. Run the following command as root from *SCALED_OUT_HOST* to shut down the network stack virtual interface:

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

3. Run the following command as root from *PROVISIONED_HOST* to restart the virtual interface:

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

   Ensure that the netmask and interface to be used match the available network configuration in *PROVISIONED_HOST*.

4. Run the following command from *PROVISIONED_HOST* to update the routing tables through arping:

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

5. Validate that the address is available by pinging it from another node. For example:

```
/bin/ping 100.200.140.206
```

6. Start the Administration Server again on *PROVISIONED_HOST* using the procedure in Enable an Administration Server to Listen on the Virtual IP Address (page 18-86).
7. Test access to the Administration Server on *PROVISIONED_HOST*:
   a. Ensure that it is possible to access the domain-specific Oracle WebLogic Server Administration Console and Oracle Enterprise Manager Fusion Middleware Control. For example, for the Oracle Fusion Customer Relationship Management domain, use these URLs:
      - `http://crminternal.mycompany.com/console`
      - `http://crminternal.mycompany.com/em`
   b. Repeat Step 7.a (page 18-91) for other domain by replacing the domain-specific URL.

18.3 Set Up Server Migration for Oracle Fusion Applications

This section describes how to configure server migration according to Oracle Fusion Applications recommendations.

18.3.1 Prerequisites for Setting Up Server Migration

Before migrating Oracle Fusion Applications domains, ensure to have done the following for all Managed Servers needing to be migrated:

- Enabled the Virtual IPs on *PROVISIONED_HOST* and *SCALED_OUT_HOST*. (See Enable Virtual IPs on PROVISIONED_HOST and SCALED_OUT_HOST (page 18-74).)
- Set the listen address for the `soa_server`*n* Managed Servers. (See Set the Listen Address for soa_servern (page 18-75).)

18.3.2 Migrate Oracle Fusion Applications

The procedures in this section apply to these domains and applications:

- Oracle SOA Suite in the Oracle Fusion Customer Relationship Management domain
- Oracle SOA Suite in the Oracle Fusion Financials domain
- Oracle SOA Suite and Oracle WebCenter Content: Imaging in the Oracle Fusion Common domain
- Oracle Fusion Common domain
- Oracle SOA Suite in the Oracle Business Intelligence domain
- Oracle SOA Suite in the Oracle Fusion Human Capital Management domain
- Oracle SOA Suite in the Oracle Fusion Supply Chain Management domain
- Oracle SOA Suite in the Oracle Fusion Project Portfolio Management domain

- Oracle SOA Suite in the Oracle Fusion Procurement domain
- Oracle SOA Suite in the Oracle Incentive Compensation domain

The list of domains may differ depending on the product offerings that are provisioned in the environment.

18.3.3 About Server Migration Configuration

The procedures described in this section must be performed for various components of the topology (for example, web tier, application tier, database tier). Variables are used in this section to distinguish between component-specific items:

- *WLS_SERVER1* and *WLS_SERVER2* refer to the managed Oracle WebLogic Servers for the enterprise deployment component
- *PROVISIONED_HOST* and *SCALED_OUT_HOST* refer to the host machines for the enterprise deployment component
- *CLUSTER* refers to the cluster associated with the enterprise deployment component

The values to be used to these variables are provided in the component-specific sections in this guide.

In this enterprise topology, configure server migration for the *WLS_SERVER1* and *WLS_SERVER2* Managed Servers. The *WLS_SERVER1* Managed Server is configured to restart on *SCALED_OUT_HOST* should a failure occur. The *WLS_SERVER2* Managed Server is configured to restart on *PROVISIONED_HOST* should a failure occur. For this configuration, the *WLS_SERVER1* and *WLS_SERVER2* servers listen on specific floating IP addresses that are failed over by Oracle WebLogic Server migration. Configuring server migration for the Oracle WebLogic Servers consists of the following steps:

- Step 1: Set up a user and tablespace for the server migration leasing table
- Step 2: Create a multi-data source using the Oracle WebLogic Server Administration Console
- Step 3: Edit Node Manager's properties file
- Step 4: Set environment and superuser privileges for the `wlsifconfig` script
- Step 5: Configure server migration targets
- Step 6: Test the server migration

18.3.4 Set Up a User and Tablespace for the Server Migration Leasing Table

The first step is to set up a user and tablespace for the server migration leasing table.

If other servers in the same domain have already been configured with server migration, the same tablespace and data sources can be used. In that case, the data sources and multi-data source for database leasing do not need to be re-created, but they have to be retargeted to the cluster being configured with server migration.

To set up a user and tablespace:

1. Create a tablespace called 'leasing'. For example, log on to SQL*Plus as the sysdba user and run the following command:

```
SQL> create tablespace leasing logging datafile
'DB_HOME/oradata/orcl/leasing.dbf'
size 32m autoextend on next 32m maxsize 2048m extent management local;
```

2. Create a user named `leasing` and assign to it the leasing tablespace:

```
SQL> create user leasing identified by password;
SQL> grant create table to leasing;
SQL> grant create session to leasing;
SQL> alter user leasing default tablespace leasing;
SQL> alter user leasing quota unlimited on LEASING;
```

3. Create the leasing table using the `leasing.ddl` script:

   a. Copy the `leasing.ddl` file located in either the *APPLICATIONS_BASE*`/fusionapps/wlserver_10.3/server/db/oracle/817` or the *APPLICATIONS_BASE*`/fusionapps/wlserver_10.3/server/db/oracle/920` directory to the database node.

   b. Connect to the database as the leasing user.

   c. Run the `leasing.ddl` script in SQL*Plus:

```
SQL> @Copy_Location/leasing.ddl;
```

18.3.5 Create a Multi-Data Source Using the Oracle WebLogic Server Administration Console

The second step is to create a multi-data source for the leasing table from the Oracle WebLogic Server Administration Console. Create a data source to each of the Oracle RAC database instances during the process of setting up the multi-data source, both for these data sources and the global leasing multi-data source.

Please note the following considerations when creating a data source:

- Make sure that this is a non-XA data source
- The names of the multi-data sources are in the format of <*MultiDS*>*-rac0*, <*MultiDS*>*-rac1*, and so on
- Use Oracle's Driver (Thin) Version 9.0.1, 9.2.0, 10, 11
- Use Supports Global Transactions, One-Phase Commit, and specify a service name for the database
- Target these data sources to the cluster assigned to the enterprise deployment component

Creating a Multi-Data Source

To create a multi-data source:

1. In the Domain Structure window in the Oracle WebLogic Server Administration Console, click the **Data Sources** link.
2. Click **Lock & Edit**.
3. Select **Multi Data Source** from the **New** dropdown list.

   The Create a New JDBC Multi Data Source page is displayed.

4. Enter `leasing` as the name.

5. Enter `jdbc/leasing` as the JNDI name.
6. Select **Failover** as algorithm (default).
7. Click **Next.**
8. Select the cluster that must be migrated. In this case, SOA cluster.
9. Click **Next**.
10. Select **non-XA driver** (the default).
11. Click **Next**.
12. Click **Create a New Data Source**.
13. Enter `leasing-rac0` as the name. Enter `jdbc/leasing-rac0` as the JNDI name. Enter `oracle` as the database type. For the driver type, select Oracle Driver (Thin) for Oracle RAC Service-Instance connections, Versions 10 and later.

    When creating the multi-data sources for the leasing table, enter names in the format of <*MultiDS*>-rac0, <*MultiDS*>-rac1, and so on.
14. Click **Next**.
15. Deselect **Supports Global Transactions**.
16. Click **Next**.
17. Enter the following for the leasing schema:
    - **Service Name:** The service name of the database.
    - **Database Name:** The Instance Name for the first instance of the Oracle RAC database.
    - **Host Name:** The name of the node that is running the database. For the Oracle RAC database, specify the first instance's VIP name or the node name as the host name.
    - **Port:** The port number for the database (1521).
    - **Database User Name:** Enter `leasing`.
    - **Password:** The leasing password.
18. Click **Next**.
19. Click **Test Configuration** and verify that the connection works.
20. Click **Next**.
21. Target the data source to the cluster assigned to the enterprise deployment component (*CLUSTER*).
22. Click **Finish**.
23. Click **Create a New Data Source** for the second instance of the Oracle RAC database, target it to the cluster assigned to the enterprise deployment component (*CLUSTER*), repeating the steps for the second instance of the Oracle RAC database.
24. Add `leasing-rac0` and `leasing-rac1` to the multi-data source.
25. Make sure the initial connection pool capacity of the data sources is set to 0 (zero). In the Datasources screen do the following:
    a. Select **Services**, then select **Datasources**.

b. Click **Datasource Name**, then click the **Connection Pool** tab.

c. Enter `0` (zero) in the **Initial Capacity** field.

26. Click **Save**, then click **Activate Changes**.

18.3.6 Edit Node Manager's Properties File

The third step is to edit Node Manager's properties file, which is located at:

APPLICATIONS_CONFIG`/nodemanager/`*PROVISIONED_HOST*

APPLICATIONS_CONFIG`/nodemanager/`*SCALED_OUT_HOST*

This must be done for the node managers in both nodes where server migration is being configured. For example:

```
Interface=eth0
NetMask=255.255.255.0
UseMACBroadcast=true
```

- **Interface:** This property specifies the interface name for the floating IP (for example, `eth0`).

  Do not specify the sub-interface, such as `eth0:1` or `eth0:2`. This interface is to be used without`:0` or`:1`. Node Manager's scripts traverse the different :*X*-enabled IPs to determine which to add or remove. For example, the valid values in Linux environments are `eth0`, `eth1`, `eth2`, `eth3`, `eth`*n*, depending on the number of interfaces configured.

- **NetMask:** This property specifies the net mask for the interface for the floating IP. The net mask should the same as the net mask on the interface; 255.255.255.0 is used as an example in this document.

- **UseMACBroadcast:** This property specifies whether to use a node's MAC address when sending ARP packets, that is, whether to use the `-b` flag in the `arping` command.

Verify in Node Manager's output (shell where Node Manager is started) that these properties are being used, or problems may arise during migration. Something like this should be seen in Node Manager's output:

```
...
StateCheckInterval=500
Interface=eth0
NetMask=255.255.255.0
...
```

The steps below are not required if the server properties (start properties) have been properly set and Node Manager can start the servers remotely.

1. Set the following property in the `nodemanager.properties` file:

   - **StartScriptEnabled:** Set this property to 'true'. This is required for Node Manager to start the Managed Servers using start scripts.

2. (UNIX only) On *PROVISIONED_HOST* and *SCALED_OUT_HOST*, restart Node Manager:

   Run the `startNodeManagerWrapper.sh` script, which is located in the *APPLICATIONS_CONFIG*`/nodemanager/`*PROVISIONED_HOST* and *APPLICATIONS_CONFIG*`/nodemanager/`*SCALED_OUT_HOST_HOST* directories.

18.3.7 Set Environment and Superuser Privileges for the wlsifconfig.sh Script (for UNIX Only)

The fourth step, for UNIX only, is to set environment and superuser privileges for the `wlsifconfig.sh` script.

1. Ensure that the PATH is set with the environment variables in the terminal from where Node Manager is started, and that it includes these files:

Table 18-5 Files Required for the PATH Environment Variable

File	Located in these directories
wlsifconfig.sh	*APPLICATIONS_CONFIG*/domains/*PROVISIONED_HOST*/*ManagedServerName*_Domain/bin/server_migration *APPLICATIONS_CONFIG*/domains/*SCALED_OUT_HOSTHOST*/*ManagedServerName*_Domain/bin/server_migration
wlscontrol.sh	*APPLICATIONS_BASE*/fusionapps/wlserver_10.3/common/bin
nodemanager.domains	*APPLICATIONS_CONFIG*/nodemanager/*PROVISIONED_HOST* *APPLICATIONS_CONFIG*/nodemanager/*SCALED_OUT_HOST*

2. Grant `sudo` configuration for the `wlsifconfig.sh` script.
   - Configure `sudo` to work without a password prompt.
   - For security reasons, `sudo` should be restricted to the subset of commands required to run the `wlsifconfig.sh` script. For example, perform these steps to set the environment and superuser privileges for the `wlsifconfig.sh` script:
     a. Grant `sudo` privilege to the Oracle WebLogic Server user (`oracle`) with no password restriction, and grant execute privilege on the `/sbin/ifconfig` and `/sbin/arping` binaries.
     b. Make sure the script is executable by the Oracle WebLogic Server user (`oracle`). The following is an example of an entry inside `/etc/sudoers` granting sudo execution privilege for `oracle` and also over `ifconfig` and `arping`:

```
oracle ALL=NOPASSWD: /sbin/ifconfig,/sbin/arping
```

   Ask the system administrator for the `sudo` and system rights as appropriate to this step.

18.3.8 Configure Server Migration Targets

The fifth step is to configure server migration targets. Assign first all the available nodes for the cluster's members and then specify candidate machines (in order of preference) for each server that is configured with server migration.

Enterprise deployment recommends using cluster-based migration. Perform the following steps, including a step to enable automatic server migration (Step 10 (page 18-97)), to configure cluster-based migration for all Managed Servers in a cluster:

1. Log in to the Oracle WebLogic Server Administration Console. For example, `http://domain_nameinternal.mycompany.com`.
2. In the Domain Structure window, expand **Environment** and select **Clusters**. The Summary of Clusters page is displayed.
3. Click the cluster used to configure migration (***CLUSTER***) in the Name column of the table.
4. Click the **Migration** tab.
5. Click **Lock & Edit**.
6. In the **Available** field, select the machine to which to allow migration and click the right arrow. In this case, select *PROVISIONED_HOST* and *SCALED_OUT_HOST*.

   When there are three (3) hosts, select all three.
7. Select the data source to be used for automatic migration. In this case, select the leasing data source.
8. Click **Save**.
9. Click **Activate Changes**.
10. Enable automatic server migration for all Managed Servers in the cluster (Perform this task for all of the Managed Servers).

    Although cluster-based migration is used for the Managed Servers, perform this step (from the **Migration** tab) to enable automatic server migration for all the Managed Servers in the selected cluster.

    a. In the Domain Structure window of the Oracle WebLogic Server Administration Console, expand **Environment** and select **Servers**.

    > **Tip:**
    >
    > Click **Customize this table** in the Summary of Servers page and move Current Machine from the Available window to the Chosen window to view the machine on which the server is running. This is different from the configuration if the server gets migrated automatically.

    b. Select the server used to configure cluster-based migration.

    c. Click the **Migration** tab, and then click **Lock & Edit**.

    d. Select **Automatic Server Migration Enabled**. This enables Node Manager to start a failed server on the target node automatically.

    e. Click **Save**.

    f. Click **Activate Changes**.

    g. Restart the administration server, node managers, and the servers for which server migration has been configured.

18.3.9 Test the Server Migration

The sixth and final step is to test the server migration. Perform these steps to verify that server migration is working properly:

From PROVISIONED_HOST:

1. Stop the *WLS_SERVER1* Managed Server.

   UNIX:

   ```
   PROVISIONED_HOST> kill -9 pid
   ```

   In the command, `process_id` specifies the process ID of the Managed Server. To identify the `pid` in the node:

   UNIX:

   ```
   PROVISIONED_HOST> ps -ef | grep WLS_SERVER1 | grep domain_name_SOACluster
   ```

2. Watch the Node Manager console. A message indicating that *WLS_SERVER1*'s floating IP has been disabled should be displayed.
3. Wait for Node Manager to try a second restart of *WLS_SERVER1*. It waits for a fence period of 10 seconds before trying this restart.
4. After Node Manager restarts the server, stop it few times. Node Manager should now log a message indicating that the server will not be restarted again locally.

From SCALED_OUT_HOST:

1. Watch the local Node Manager console. Ten (10) seconds after the last try to restart *WLS_SERVER1* on *PROVISIONED_HOST*, Node Manager on *SCALED_OUT_HOST* should prompt that the floating IP for *WLS_SERVER1* is being brought up and that the server is being restarted in this node.
2. As an example, for Oracle SOA Suite Managed Servers, access the soa-infra console in the same IP.

Verification from the Administration Console

Migration can also be verified in the Administration Console:

1. Log in to the Administration Console.
2. Click **Domain** on the left console.
3. Click the **Monitoring** tab and then the **Migration** subtab.

   The Migration Status table provides information on the status of the migration.

To complete server migration in a cluster, perform the same steps on the second, third, and so on, managed servers.

18.4 Next Steps

If the Oracle Fusion Customer Relationship Management product offering has been installed, continue to Complete Oracle Fusion Customer Relationship Management Post-Installation Tasks (page 19-1). Otherwise, go to the section that corresponds to the product offering that is installed.

19

Complete Oracle Fusion Customer Relationship Management Post-Installation Tasks

This section describes the Oracle Fusion Customer Relationship Management (Oracle Fusion CRM) post-installation tasks that must be reviewed and completed before starting working with an Oracle Fusion CRM implementation.
This section contains the following topics:

- Install and Configure the Bounce Handling Daemon (page 19-1)
- Set Up SMS Marketing (page 19-2)
- Set Up Implicit Personalization Behavior (page 19-3)
- What To Do Next (page 19-5)

19.1 Install and Configure the Bounce Handling Daemon

The E-Mail Marketing Server is a combination of components designed to support high volume, personalized e-mail messages, and to track e-mail bounces and click-through responses. The bounce handling daemon (BHD) tracks e-mail messages that cannot be delivered, parses the returned e-mail messages, and records the cause of the e-mail bounce.

The bounce handling daemon installation program is available on the Oracle Fusion Middleware companion disk. Prior to installing the program, ensure the Marketing application has been provisioned, noting the Oracle SOA Suite Server host and port, and determined the designated server to place the daemon. The designated server must have port 25 available.

It is recommended to place the bounce handling daemon in the DMZ. Optionally, place the bounce handling daemon behind an inbound mail transfer agent (MTA). The approach chosen depends on the configuration of the network, DMZ, existing inbound mail transfer agent, and firewall.

Complete the following steps to install and configure the bounce handling daemon:

1. Using the companion disk, locate and run the installation program: `fusionbhd/Disk1/runInstaller`. Provide information when prompted, such as the JDK location, designated BHD server installation directory, and the http or https protocol, host and port for the Marketing SOA URL.
2. Navigate to the `WLS_HOME/config/fwmconfig` directory and copy the files and directory listed below to the `$HOME/bhd/fusionapps/crm/ewm/bhd/bin` directory.
    - jps-config-jse.xml
    - default-keystore.jks
    - bootstrap directory (including the cwallet.sso)

3. Update the root user permissions to allow read, write, and execute access to the jps-config-jse.xml and default-keystore.jks files and the bootstrap directory.
4. Update the root user permissions to allow read, write, and execute access to the BHD server installation directory, it's subdirectories and files. The top level BHD server installation directory is specified during the install process.
5. Grant read access to the fusionapps/crm/ewm/bhd/logs directory to nonroot users to provide availability to application log files.
6. Log in as a root user in UNIX.
7. Navigate to the `fusionapps/crm/ewm/bhd` directory.
8. Enter the `$ ./bin/bhd-onpremise-ctl.sh start` command. This commands starts the BHD service for port 25.

For more information on provisioning, see Provision a New Oracle Fusion Applications Environment (page 13-1).

19.2 Set Up SMS Marketing

To use the SMS marketing campaign capability within Oracle Fusion Customer Relationship Management, enable it after installing Oracle Fusion Applications. Customers interested in SMS marketing campaigns need to complete SMPP Driver configuration in the SOA suite component Oracle User Messaging Service.

An instance of the SMPP driver is already installed as part of the Oracle Fusion Applications installation and is a part of the Oracle User Messaging Service, but it does not point to any User Messaging Server. To configure the SMPP driver, an account with an SMPP driver gateway vendor Is needed.

IMPORTANT

Before proceeding with the enabling process, ensure to have access rights to update and deploy applications on the WebLogic Administration Console and Oracle Enterprise Manager associated with the Customer Relationship Management domain.

1. Log in to the WebLogic Administration Console associated with the Customer Relationship domain.

   Under Deployments, see the application **usermessagingdriver-smpp** in the **Installed** state.
2. Expand **usermessagingdriver-smpp** and navigate to Targets tab. The Current Targets column shows (None specified), indicating that no target is configured.
3. On the console, switch to the **Lock & Edit** mode, update the target to all servers in the CRM_SOACluster, and save the changes.
4. While remaining in the **Lock & Edit** mode for the console, navigate to Deployments, select the checkbox next to **usermessagingdriver-smpp**, and click Update. The Update Application Assistant wizard appears.
5. For the **Deployment Plan Path** field, click **Change Path** and select the Fusion Applications specific deployment plan: *APPTOP*`/instance/applications/ums/crm/usermessagingdriver-smpp_FusionPlan.xml`.
6. On the next screen of the Update Application Assistant wizard, select **Release Configuration** to commit the changes made until this point. The state of the application **usermessagingdriver-smpp** changes to **Active**.

7. Log out of WebLogic Administration Console.
8. Log in to the Oracle Enterprise Manager associated with the Customer Relationship Management domain.
9. Expand **CRMDomain** - **User Messaging Service**, right-click the application **usermessagingdriver-smpp** and select **SMPP Driver Properties** from the context menu.
10. Configure the driver and apply the changes.
11. Restart the usermessagingdriver-smpp application to bring into effect the driver configuration changes.

Use now the SMS Marketing capability of Oracle Fusion Customer Relationship Management.

19.3 Set Up Implicit Personalization Behavior

This topic covers the post-deployment activities required for Oracle Fusion CRM applications that support implicit personalization behavior.

Performing these activities fixes the inconsistent implicit personalization behavior between sessions in the following Oracle Fusion CRM applications:

- Oracle Fusion CRM Common
- Oracle Fusion Territory Management
- Oracle Fusion Customer Center
- Oracle Fusion Marketing
- Oracle Fusion Order Capture Common Components
- Oracle Fusion Sales

19.3.1 Post-Deployment Activities

Make the following changes to the `adf-config.xml` file as a post-deployment activity.

These steps are applicable only for the Oracle Fusion CRM applications where implicit personalization behavior is supported.

1. Shut down the domain where the application is deployed.
2. Search for `adf-config.xml` file. For example, for Sales application, this file is typically located at `Sales <deploy directory>/SalesApp/V2.0/app/SalesApp/adf/META-INF/adf-config.xml`
3. Back up `adf-config.xml` file.
4. Open `adf-config.xml` file in a text editor and comment out all occurrences of the tag `<adf-faces-config>` under the root node `<adf-config>. . .</adf-config>`. For example:

   ```
   <!-- adf-faces-config xmlns="http://xmlns.example.com/adf/faces/
   config">. . . </adf-faces-config -->
   ```

5. Add the following after the commented section.

   ```
   <adf-faces-config xmlns="http://xmlns.example.com/adf/faces/config">
   ```

```
        <persistent-change-manager>
                <persistent-
change-manager-class>oracle.adf.view.rich.change.MDSDocumentChangeManager</
persistent-change-manager-class>

        </persistent-change-manager>

        <taglib-config>
                        <taglib uri="http://xmlns.example.com/adf/
pageeditor">
                                <tag name="layoutCustomizable">
                                        <!-- Added to pass JAudit-->
                                        <attribute name="layout">
                                                <persist-changes>true</
persist-changes>
                                        </attribute>
                                </tag>
                        </taglib>

                <taglib uri="http://xmlns.example.com/adf/faces/
customizable">
                        <tag name="showDetailFrame">
                                <persist-operations>all</persist-operations>
                                <!-- Added to pass JAudit-->
                                <attribute name="disclosed">
                                        <persist-changes>true</persist-
changes>
                                </attribute>
                                <attribute name="height">
                                        <persist-changes>true</persist-
changes>
                                </attribute>
                        </tag>

                        <!-- Added to pass JAudit-->
                        <tag name="portlet">
                                <attribute name="disclosed">
                                        <persist-changes>true</persist-
changes>
                                </attribute>
                                <attribute name="height">
                                        <persist-changes>true</persist-
changes>
                                </attribute>
                        </tag>
                </taglib>


                <taglib uri="http://xmlns.example.com/adf/faces/rich">
                        <tag name="column">
                                <persist-operations>all</persist-operations>
                                <attribute name="displayIndex">
                                        <persist-changes>true</persist-
changes>
                                </attribute>
                                <attribute name="visible">
                                        <persist-changes>true</persist-
changes>
                                </attribute>

                                <attribute name="width">
```

```
                                        <persist-changes>true</persist-
changes>
                                    </attribute>
                                </tag>
                            </taglib>
                        </taglib-config>
</adf-faces-config>
```

6. Specifically for Customer Center application, and as an additional step, locate these lines under the `<mds:cust-config>` section:

```
<mds:match path="/oracle/apps/">
        <mds:customization-class
name="oracle.apps.fnd.applcore.customization.ProductFamilyCC"/>
        <mds:customization-class
name="oracle.apps.fnd.applcore.customization.SiteCC"/>
</mds:match>
```

   When lines are commented, they appear as:

```
<!--mds:match path="/oracle/apps/">
        <mds:customization-class
name="oracle.apps.fnd.applcore.customization.ProductFamilyCC"/>
        <mds:customization-class
name="oracle.apps.fnd.applcore.customization.SiteCC"/>
</mds:match>
```

7. Save and close the file.
8. Start up the domain that hosts the Oracle Fusion CRM application.

19.4 Next Steps

If the Oracle Fusion Financials product offering has been installed, go to Complete Oracle Fusion Financials Post-Installation Tasks (page 20-1). Otherwise, go to the section that corresponds to the product offering that is installed.

20

Complete Oracle Fusion Financials Post-Installation Tasks

This section describes the Oracle Fusion Financials post-installation tasks that must be reviewed and completed before starting working with an Oracle Fusion Applications Oracle Fusion Financials implementation.
This section contains the following topics:

- Set Up the Financial Reporting Center (page 20-1)
- Set Up Oracle Document Capture and Oracle Forms Recognition (page 20-6)
- Oracle Fusion Advanced Collections Dunning (page 20-18)
- Enable Encryption of Sensitive Payment Information (page 20-19)
- Configure a Communication Channel to a Payment System (page 20-19)
- Configure Oracle B2B Inbound Flow to Receive Supplier Invoices in XML (page 20-20)
- Set Up Oracle B2B to Send Receivables Transactions in XML (page 20-24)
- What To Do Next (page 20-26)

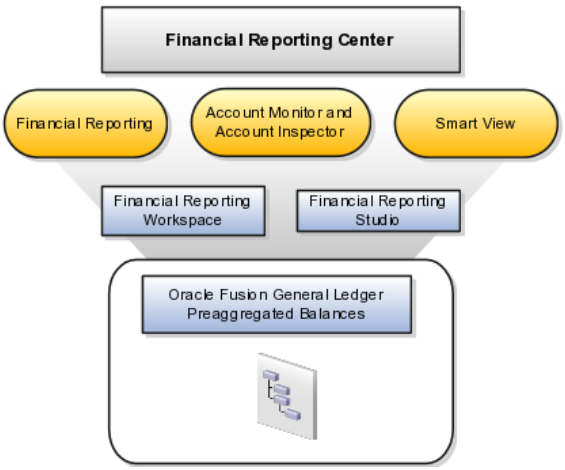
20.1 Set Up the Financial Reporting Center

The Oracle Fusion Financial Reporting Center provides functionality for reporting on Oracle Fusion General Ledger balances. It provides secure, self-service access to reports that use real time account information.

Design traditional financial report formats such as balance sheets, profit and loss statements, and cash flow reports. Design also nontraditional formats for financial or analytic data that include text and graphics.

The following figure shows the main components in the Financial Reporting Center: Financial Reporting, Account Monitor, Account Inspector, Smart View, Financial Reporting Workspace, and Financial Reporting Studio. These components use the Oracle Fusion General Ledger preaggregated balances as the staring data.

Figure 20-1 Financial Reporting Center



20.1.1 Components

Financial Reporting Center is comprised of numerous components:

- **Financial Reporting**: Financial users and analysts access live reports and books or published snapshot reports and books from previously scheduled batches in a variety of formats. Other functionality includes:
  - Refreshing report data using runtime points of view or parameters
  - Drill through capability from parents to other parents
  - Drill down to detail balances, journal lines, and subledger transactions.
- **Oracle Hyperion Smart View**: Financial analysts view, import, manipulate, distribute, and share data from the Oracle Fusion General Ledger balances in Microsoft Excel.
- **Account Monitor and Account Inspector**: Financial analysts monitor and track key account balances in real time at every level of the dimensions and hierarchies. These tools provide multidimensional account analysis and drill down capability.
- **Workspace**: Reporting administrators create, open, save, and delete folders and store report objects, reports, and snapshot reports.
- **Oracle Hyperion Financial Reporting Studio**: Report authors use an object-oriented graphical report layout with report objects, such as text boxes, grids, images, and charts, to design reports.

20.1.2 Set Up the Financial Reporting Center: Critical Choices

Oracle Fusion Financial Reporting Center is a powerful tool for accessing, designing, and presenting financial reports and analytic data. The critical choices required to configure and install the components in Financial Reporting Center consist of:

- Configuring Financial Reporting Center
- Installing and configuring Financial Reporting Studio, performed by the end users.
- Installing Smart View, performed by the end user.

- Configuring Workspace Database Connection, performed by the administrator.
- Configuring Oracle Fusion Transactional BI Dimensions

20.1.3 Configure Financial Reporting Center

Access the reports through the folder structure in the Financial Reporting Center and Workspace installed with Oracle Fusion Financial Applications. The Oracle Fusion Business Intelligence (BI) administrator defines the folder structure in Workspace considering the company's security requirements for folders and reports, as well as report distribution requirements for financial reporting batches. Security can be set on folders and reports from Workspace. The BI administrator grants access to view the folders and reports .

20.1.4 Install and Configure Financial Reporting Studio

Oracle Hyperion Financial Reporting Studio is client-based software. If Oracle Fusion Applications is accessed from Oracle Cloud, connect to the Financial Reporting Studio through a Windows Remote Desktop Connection.

Otherwise, report authors download the installation files for Financial Reporting Studio from Workspace by clicking **Navigator**, then **Financial Reporting Center**, and then **Open Workspace for Financial Reporting**. Once Workspace is launched, click **Tools**, then **Install**, and then **Financial Reporting Studio**. After performing the prerequisites and completing the installation, launch the Financial Reporting Studio. Provide the user ID, password, and the Server URL. Derive the Server URL information by following the steps:

1. Open **Navigator**, then **Financial Reporting Center**, and then **Open Workspace for Financial Reporting**.
2. Edit the Workspace URL by removing `workspace/index.jsp`.

   Following are two examples of Server URLs:

   - If the Workspace URL is `https://example.com/workspace/index.jsp`, the Server URL is `https://example.com`.
   - If the Workspace URL is `https://example.com:10622/workspace/index.jsp`, the Server URL is `https://example.com:10622`.
3. Copy the modified URL to the Server URL field.

For end users installing the Oracle Fusion Financials Reporting Studio, the installer launches a separate console window that continues to run for a brief time after the installation completes the setup tasks. The process is normal, expected, and applies to Oracle Hyperion Reporting Studio installations in both the Oracle Fusion Applications and Enterprise Performance Manager modes.

Wait for the console window to close, which happens automatically before clicking **Finish** on the Financial Reporting Studio Installation dialog box. When clicking **Finish** before the console window closes, the Financial Reporting Studio installation may not fully complete.

MANDATORY: Save a new report before attempting to preview it with Web Preview.

Prerequisites needed for installing the Financial Reporting Studio are:

- Financial Reporting Studio Client Certifications

- Microsoft Office installed on the end-users computers

See Installing Multiple Versions of Financial Reporting Studio on a Client Machine in the *Oracle Enterprise Performance Management System Installation and Configuration Guide*, and Installing Financial Reporting Studio in the *Oracle Hyperion Enterprise Performance Management System EPM System Standard Deployment Guide*.

20.1.5 Install Smart View

Smart View is a Microsoft Excel add-in that must be loaded to each client. To download the installation files from Workspace click **Navigator**, then **Financial Reporting Center**, and then **Open Workspace for Financial Reporting**. Once the Workspace is launched, click **Tools**, then **Install**, and then **Smart View**.

Smart View can be installed only on a Windows operating system because it is an add-in to Microsoft Office products.

Once Smart View is installed, it must be configured to connect to Oracle Fusion Applications. This is done using the Smart View Shared Connections URL. Derive the Shared Connections URL by following the steps below:

1. Open Workspace for Financial Reporting from the Financial Reporting Center task panel.
2. Edit the Workspace URL, for example, if the Workspace URL is `https://example.com/workspace/index.jsp`. Remove `index.jsp` and add `SmartViewProviders` at the end of the URL.

   This is another example for a Cloud based environment: If the Workspace URL is `https://example.com:10622/workspace/index.jsp`, the Shared Connections URL is `https://example.com:10622/workspace/SmartViewProviders`.
3. Copy the URL.
4. Launch Excel.
5. Navigate to the **Smart View** menu, then **Options**, and then **Advanced**.
6. Paste the URL in the Shared Connections URL field.
7. Click **OK**.

For more information on configuring Smart View client for users, see Installing Smart View in the *Oracle Hyperion Smart View for Office User's Guide for Oracle Hyperion Smart View*.

To connect Oracle Fusion General Ledger Balances cubes in Smart View:

Perform these steps only once for a new server and database.

1. Open Smart View from **Start** menu, then **Programs**, then **Microsoft Office**, and then **Microsoft Excel 2007**.
2. Go to the **Smart View** menu, then **Open** in the **Start** on the ribbon, then click the Smart View Panel that appears in the drop down box under the ribbon. This launches a task pane.
3. Click **Shared Connections** on the task pane.
4. Log in with the user name and password.

5. Select Essbase from the **Select Server to proceed** dropdown list of shared connections.

   If the Essbase Server is not there, then it has to be added. Use the following steps:

   - Click the **Add Essbase Server** link on the bottom of the spreadsheet.
   - Specify the Essbase Server login and password.
   - Expand the Essbase sever and locate the cube under it.

6. Click **Expand** to expand the list of cubes.
7. Expand the cube (name of the chart of accounts).
8. Click **db**. A list of functions appears on the bottom of the panel.
9. Click **Ad hoc analysis**.

To set how the name and alias of the Essbase database appears:

1. Click **Options** on the ribbon, then select the **Member Options,** and then select **Member Name Display**.
2. Set one of the following options:

   - **Distinct Member Name**: Only shows the full Essbase distinct path.
   - **Member Name and Alias**: Shows both the member name and the alias.
   - **Member Name Only**: Shows only the member name.

   The Smart Slice feature is not supported in Oracle Fusion General Ledger. For all other documentation, see Installing Smart View in the *Oracle Hyperion Smart View for Office User's Guide for Oracle Hyperion Smart View*.

20.1.6 Configure Workspace Database Connections

Administrators need to create database connections from Workspace so users can access the cubes from Workspace and Financial Reporting Studio.

Ledger setup has to be completed before the database connection can be created. Oracle Fusion General Ledger balances cubes are created as part of ledger setup. There is a separate cube for each combination of chart of accounts and accounting calendar. A database connection is needed for each cube.

To define a database connection, do the following:

1. From the **Navigator**, select **Financial Reporting Center**.
2. From the **Financial Reporting Center** task panel, select **Open Workspace for Financial Reporting**.
3. From within Workspace select the **Navigator** menu, then **Applications**, then **BI Catalog**.
4. From the **Tools** menu, select **Database Connection Manager.**
5. Click **New**.
6. Enter a user-friendly database connection.
7. Enter Essbase as the **Type**, the server, user name, and password.

8. Select **Application** (cube) and **Database** from the list of values. Expand the **Application** name to see the related **Database**, for example, db.
9. Click **OK** twice to save the selections.
10. Click **Close** in the Database Connection Manager window to save the connection.

For more information about configuring Essbase database connections in Workspace, see Understanding Essbase in the *Oracle Essbase Database Administrator's Guide for Oracle Essbase*.

The database connection is available in both Workspace and Financial Reporting Studio. Optionally, it can be set up in Financial Reporting Studio when putting grids on a report. This should only be done by an administrator.

20.1.7 Configure Oracle Fusion Transactional BI Dimensions

Within Oracle Fusion Transactional Business Intelligence (BI), Accounting Segment Dimensions such as Balancing segment or Cost Center segment are based on the Chart of Accounts configuration. These segments can be configured to be tree-enabled, which means that hierarchies are defined on the segment values for rollup purposes. In such scenarios, filter by a specific hierarchy when performing ad-hoc queries against tree-based accounting segments. Incorrect results may occur if tree filters are not applied. To apply tree filters, create a filter condition on Tree Filter attributes in Accounting Segment Dimensions.

For information on setting up General Ledger accounting segments, see the *Oracle Cloud Administering Transactional Analyses*.

20.2 Set Up Oracle Document Capture and Oracle Forms Recognition

Oracle Fusion Financials uses Oracle Document Capture to import payables invoice and expense receipt images from various sources including scanners, e-mail, and FTP sites. Oracle Fusion Payables also leverages Oracle Forms Recognition for intelligent data recognition for invoice entry.

This task is not applicable to Oracle Cloud implementations.

To implement Oracle Fusion Expenses and use automated receipt image processing, then set up Document Capture and configure it for expenses. If Oracle Fusion Automated Invoice Processing has been licensed, then set up Forms Recognition in addition to Document Capture, and configure both for payables.

To set up Document Capture and Forms Recognition, perform these steps in the specified order:

1. Configure Document Capture and Forms Recognition network shares.
2. Install and configure Document Capture and Forms Recognition on Windows desktop.

For details regarding users and privileges for the setup, refer to the installation guides of Oracle Document Capture and Oracle Forms Recognition.

20.2.1 Configure the Oracle Webcenter: Imaging and Process Management Input Directory Network Share

Oracle Document Capture and Oracle Forms Recognition save images to the Oracle Webcenter: Imaging (Imaging) input directory for further processing. Since Document Capture and Forms Recognition are Windows-based products, configure the input directory as a network shared directory so that Document Capture and Forms Recognition can save images to this location.

This task is not applicable to Oracle Cloud implementations.

To install network sharing for Oracle Document Capture and Oracle Forms Recognition:

1. Verify the Imaging input directory path.
2. Configure the network share for the Imaging input directory.
3. Verify Imaging Input Agent.
4. Configure the Windows mapped network drive for the input directory.

20.2.1.1 Verify the Oracle Webcenter: Imaging Input Directory Path

To verify the input directory path:

1. Log in to the Enterprise Manager on the Common Domain, as an Administrator.
2. Navigate to the Domain level.
3. Select **System MBean Browser**.
4. Open the `oracle.imaging.config.bean`.
5. Look for the **InputDirectories** value.
   - This is the Imaging input directory where Imaging and Process Management checks for incoming scanned invoices.
   - The path points to a directory on the server running Imaging.
6. Open a terminal window for the server running Imaging and check the path specified for the Input Directory.

   The path should be a symbolic link pointing to a folder on a storage server. Both the Imaging server and the Windows server must have read/write access to the same folder on the storage server.

20.2.1.2 Configure the Network Share for the Oracle Webcenter: Imaging Input Directory

Enable the Imaging input directory to be accessed by Document Capture or Forms Recognition running on Windows:

- The storage server share should have Common Internet File System (CIFS) enabled for Windows compatible share names.
- The path to the Windows share name should be in Universal Naming Convention (UNC) format.

If licensed Oracle Fusion Automated Invoice Processing has been licensed, individual Oracle Document Capture workstations used for scanning invoices do not need access to the input directory.

The storage host must grant read/write access to the Imaging Input Agent running on the Common Domain host and at least one Windows user with login access to the server running Oracle Document Capture and Oracle Forms Recognition.

20.2.1.3 Verify Oracle Webcenter: Imaging Input Agent

To verify if the Imaging Input Agent is operating correctly:

1. Log in to the Oracle Enterprise Manger for the Common Domain.
2. Navigate to the Imaging Server.
3. Restart the server.

   After the server restarts, check the input directory path referenced earlier. A file named `InputAgent.lock`should be shown. If this file is not shown, verify that the image server is running and check the image server logs for errors. If there are errors, check whether the Input Agent has the necessary permissions in the storage directory. The Input agent needs read/write file access to this directory.

   Additionally, verify that the Windows network drive is correctly mapped with permitted read/write access. Do this by creating a folder or file from the Linux box where the Imaging server is running. Oracle Forms Recognition is not compatible with NFS mounted shares on Windows. Use create CIFS shares for Windows instead. The Windows user should be able to view it on the Windows network drive and should be able to open and modify it.

20.2.1.4 Configure the Windows Mapped Network Drive for the Input Directory

Log in to the Windows desktop with a user ID that has explicit access to the input directory file share.

Map the drive on the Windows servers running Oracle Forms Recognition and Oracle Document Capture servers. The drive is not mapped on individual user machines running Oracle Document Capture client for Invoicing.

1. Open Windows Explorer.
2. Right-click the folder icon that corresponds to the computer name.
3. Select Map Network Drive.
4. Select a drive letter, for example Y.
5. Specify the path for the shared directory on the storage host, using the UNC format: `\\<host name>\<name>`.
6. Click **OK** and verify that the network share now appears in Windows Explorer as the specified drive letter. If Windows Explorer is unable to create the mapped drive, the issue may be that the Common Internet File System (CIFS) is not enabled on the storage host.
7. Verify that Windows users have read/write access to the input directory and all its file contents.

8. Verify that the Input Agent directory includes the `InputAgent.lock` file (the input directory may be a sub-directory of the share). If the `InputAgent.lock` file is not seen, the following are possible explanations:
   - The Imaging Server is not running and needs to be started.
   - The Imaging Server is running but the Input Agent does not have the appropriate access to the network share directory and cannot generate the `InputAgent.lock` file.
   - The Imaging Server configuration for Input Agent Directory does not point to the same network share as the mapped network drive, or it points to a sub-directory other than the one being verified.

To verify that the Windows network drive is correctly mapped with permitted read/write access, create a folder or file from the Linux box where the Imaging server is running and check if the Windows user is able to view the folder or file on the Windows network drive and is able to open and modify it.

20.2.2 Configure the Oracle Forms Recognition Project Network Share

The Oracle Forms Recognition project directory contains directories and files shared by Oracle Document Capture, Oracle Forms Recognition Designer, Oracle Forms Recognition Verifier, and Oracle Forms Recognition Runtime Service. In a typical installation scenario, these applications are not installed on the same computer. However, the project directory must be stored in a shared directory accessible to each application, regardless of where it is installed.

This task is not applicable to Oracle Cloud implementations.

To configure the Oracle Forms Recognition project network share, do the following:

1. Configure the share for the Oracle Forms Recognition AP Project Folder.
2. Configure the Windows mapped network drive for the AP Project Folder.

20.2.2.1 Configure the Network Share for the Oracle Forms Recognition AP Project Folder

Ensure that the Oracle Forms Recognition project directory is accessible to the Oracle Document Capture or Oracle Forms Recognition applications running on Windows.

- The storage server share should be configured with Common Internet File System (CIFS) enabled for Windows compatible share names.
- The Windows share name must be in universal naming convention (UNC) format.
- The network share is meant for exclusive use by the Oracle Document Capture or Oracle Forms Recognition applications running on Windows.

Configure the storage host to share the Oracle Forms Recognition Project directory with the Oracle Document Capture and Oracle Forms Recognition users.

20.2.2.2 Configure the Windows Mapped Network Drive for the AP Project Folder

Log on to the Windows desktop with a user ID that has explicit access to the Oracle Forms Recognition project file share.

This mapping is done on the following:

- Windows servers running Oracle Forms Recognition and Oracle Document Capture servers for Expenses
- Servers running Oracle Forms Recognition Designer and Verifier
- Invoice scanning workstations running Oracle Document Capture

Perform the following steps to configure the Windows mapped network drive:

1. In Windows Explorer, identify the folder for the PC icon that displays the same name as that of the actual PC.
2. Right-click the folder icon that corresponds to the computer name.
3. Right-click the folder and select Map Network Drive.
4. Select a drive letter, for example X.
5. Specify the path for the shared directory on the storage host, using the UNC format: \\<host name>\<share name>.
6. Click **OK** and verify that the network share now appears in Windows Explorer as the specified drive letter. If Windows Explorer is unable to create the mapped drive, the issue may be that CIFS is not enabled on the storage host.

20.2.3 Install and Configure Oracle Document Capture and Oracle Forms Recognition on Windows

To configure Oracle Document Capture and Oracle Forms Recognition to run on Windows, perform the following tasks in the given order:

These tasks are not applicable to Oracle Cloud implementations.

1. Install prerequisites.
2. Run the setup utility.
3. Install Oracle Document Capture.
4. Configure Oracle Document Capture.
5. Configure Oracle Document Capture Import Server for Importing Images from E-Mail.
6. Install Oracle Forms Recognition for Payables.
7. Configure Oracle Forms Recognition for Payables.
8. Configure shared drive access for Oracle Forms Recognition Runtime Service Manager.

Ensure that the required network shares have been configured before performing these steps. Steps 4 to 7 (Configure Oracle Document Capture to Configure Oracle Forms Recognition for Payables) are required only if Oracle Fusion Automated Invoice Processing has been licensed.

20.2.3.1 Prerequisites

Before proceeding with the installation and configuration of Oracle Document Capture and Oracle Forms Recognition, do the following:

1. Ensure that the empty Document Capture schema is created in the Oracle database with at least three user profiles: a read-only user profile for reporting, a read/write user profile for schema administration, and a read/write user profile for the Document Capture runtime connection. Document Capture tracks batches and stores audit information in the schema tables. The Document Capture runtime connection configuration includes read/write user profile credentials so that Document Capture can write data to the schema tables without requesting a separate login.
2. Install and Configure Oracle database support for Open Database Connectivity (ODBC) and OLEDB. See *Oracle Database Software Downloads* on Oracle Technology Network.
3. Ensure that Java Runtime Environment (JRE) 1.6 or higher is installed. See Java Downloads on Oracle Technology Network.
4. To configure expenses, create the folder `C:\ODC Projects\EXM\Import`. Share this folder with read-write permissions enabled for incoming expense documents.
5. Download the **Capture-FormsRec_FA.zip** file from the Oracle Fusion Applications repository. The zip file is located at `<repository_root>/installers/Capture-FormsRec`.

20.2.3.2 Run the Setup Utility

This program streamlines the installation and configuration of Oracle Document Capture and Oracle Forms Recognition.

1. Extract the contents of the Capture-FormsRec_FA.zip (downloaded earlier from the Oracle Fusion Applications repository) to a temporary folder and double-click **Setup.exe** to run the utility. The Oracle WebCenter Capture and Forms Recognition for Fusion Financials Setup window appears.
2. In the I/PM Input Agent Folder field, enter a UNC path of the folder from which IPM uploads the documents. For example, `\\<server_name>\<share_name>`.
3. In the Oracle Forms Recognition AP Project Folder field, provide the root directory for the AP project. For example, `<Drive Letter>:\OFR`. If the specified directory does not exist at the mentioned location, the installer creates a directory with the same name.

Install and configure Oracle Document Capture and Oracle Forms Recognition. The relevant instructions are provided in the subsequent sections.

20.2.3.3 Install Oracle Document Capture

Repeat the installation procedure on every machine that runs Oracle Document Capture.

If an error occurs while installing Oracle Document Capture, verify if the computer's print spooler service is running (Start , then **Settings**, then **Control Panel**, then **Administrative Tools**, and then **Services**). Scroll down until Print Spooler is seen. If the status shows that it has not started, right-click the **Print Spooler** service and select **Start**. Now retry installing Oracle Document Capture.

1. On the Oracle WebCenter Capture and Forms Recognition for Fusion Financials Setup window, in the Oracle Document Capture region, click **Install**. The Oracle Document Capture installer appears.

2. Proceed through the installation steps to complete the installation. Once the installation is complete, the Setup utility initiates an additional process to install a patch.
3. Proceed through the options to complete the patch installation. After it is complete, the **Configure** button in the Oracle Document Capture region is enabled.

20.2.3.4 Configure Oracle Document Capture

To configure Oracle Document Capture:

1. On the Oracle WebCenter Capture and Forms Recognition for Fusion Financials Setup window, in the **Oracle Document Capture** region, click **Configure**. The Oracle Document Capture Configuration Utility dialog box appears.
2. In the **Batch Folder** field, browse and select the folder where Oracle Document Capture batch files are stored.
3. In the **Commit Folder** field, browse and select the folder where Oracle Document Capture commits the captured files.

   If Oracle Forms Recognition is used, leave this blank for now. After installing Oracle Forms Recognition, come back and set the folder path to `<Drive Letter>:\OFR_Project\AP\Global\Import`. If Oracle Forms Recognition is not being installed, set this to the Image Processing Management Input Directory.
4. Click **OK**. The Capture Batch Setup dialog box appears.

   The Capture Batch Setup dialog box appears only when configuring Oracle Document Capture for the first time.
5. On the Capture Batch Setup dialog box, do the following:
   a. In the **Enter Path to Network Batch Folder** field, specify the same folder path that is provided in the Batch Folder field on the Oracle Document Capture Configuration Utility dialog box.
   b. In the **Enter Path to Network Commit Folder** field, specify the same folder path that is provided in the Commit Folder field on the Oracle Document Capture Configuration Utility dialog box.
   c. In the **Capture Database Setup** area, select the **Other Database Platform** option and click **Configure**. The Configure Database Connection dialog box appears.
   d. Click **Configure DB Connection**. The Data Link Properties dialog box appears.

      - On the **Provider** tab, select **Oracle Provider for OLE DB** and click **Next**.

      - On the **Connection** tab, do the following:

        i. In the **Data Source** field, enter the name of the Oracle database.

        ii. Select the **Use a specific user name and password** option and provide the **User name** and **Password** that have read and write access to the Capture schema.

        iii. Select the Allow saving password option.

        iv. Click **Test Connection** to check for connectivity issue if any, and resolve it before proceeding with the configuration.

      - Click **OK**. The Data Link Properties dialog box closes.

e. On the Configure Database Connection dialog box, click **OK**. The Configure Database Connection dialog box closes.

f. On the Capture Batch Setup dialog box, click **Initialize DB** to populate the Capture schema in the Oracle database.

- Initializing the database is required when configuring Oracle Document Capture for the first time.
- If a standalone instance of Oracle Document Capture is being configured for testing, use the default Capture database (capture.mdb) that is installed with the product. On most systems, this database is located in the Oracle Document Capture installation directory. On Windows 2008 R2, the Capture database is installed in the system `ALLUSERPROFILES\Oracle Document Capture` folder. By default, `ALLUSERSPROFILES` is `C:\ProgramData`.

  To use the default capture.mdb, create a data source based on Microsoft Jet OLE DB 4.0. The local Capture database is only used for testing. For production environments, create the Capture schema in the Oracle database.

A warning message appears indicating loss of existing data in the Capture schema proceeding with the initialization.

- Click **Yes**. The Security Model dialog box appears.

- Select the option that is appropriate to the system environment and click **OK**. The Microsoft Windows Open dialog box appears.

- Navigate to the Oracle Document Capture installation directory, search for the `Capture_ORACLE.sql` file, select it, and click **Open**. Oracle Document Capture runs the script of the Capture schema and creates the required tables in the Oracle database.

g. On the Capture Batch Setup dialog box, click **OK**. The Capture Batch Setup dialog box closes.

6. On the Oracle Document Capture Configuration Utility dialog box, click **OK**.

If prompted for user credentials, enter the user name and password that have been used during the configuration process.

20.2.3.4.1 Configure Additional Routing Attributes for Manual Scanning

To configure additional routing attributes for manual scanning:

1. If the Automated Invoice Processing components are being installed for the first time, the latest cabinet files already exist. Thus, skip the unzip and import steps and proceed to Step 2. Otherwise, if Automated Invoice Processing is already used, perform the following steps to import the latest cabinet files:

   a. Unzip the `Capture-FormsRec_FA.zip` package.

   b. Import the `ApInvoiceOdcCabinet.zip` and `ApInvoiceOfrCabinet.zip` files using the Document Capture Import Export utility.

2. Open Oracle Document Capture and select Indexing - Manage Index Profiles.

3. Select the **Fields** tab for index profiles Fusion Payable Invoices With OFR and Fusion Payable Invoices Without OFR and verify that they contain the following index fields: Routing_Attribute_1 through Routing_Attribute_5, and URN.

4. Select **System - Manage Macros**.
5. Select the **Scan for ISIS** category.
6. Select the **OFR-Scan-ISIS-Macro** macro.
7. Click **Setup**.
8. (Optional) Review and modify the Prompt User upon closing Review option in the Index Documents area to meet the requirements.
9. Select the **Do not Commit Batch** option in the **Commit Options** area.
10. Click **OK**.
11. (Optional) If all five attributes are not planned to be used, or a longer length are planned to be used for each of the remaining attributes, change the maximum length of the index field attributes:
    a. Select **Admin - File Cabinets**.
    b. Select either **Payables Invoice with OFR** or **Payables Invoices without OFR**, depending on which file cabinet are used.
    c. Select the routing attribute to edit.
    d. Click **Edit**.
    e. Update the **Max Length** field.
       - Do not modify the index field names, otherwise the predefined attribute configuration does not work as expected.
       - The sum of the maximum lengths is limited to the number of characters allowed by Oracle Forms Recognition (233), minus the number of characters in the file path where the image files are imported, minus the TIF file extension including the period (4), minus the characters reserved for internal use (40), minus one separator character per attribute.

         For example, if the image files are imported into the `C:\OFR\Import\` directory and if all five attributes are used, do not exceed 170 characters (233-14-4-40-5).
       - The number of characters for an attribute value cannot exceed the Max Length for that attribute. If the attribute value character count exceeds the specified maximum length, an error is displayed on the Oracle Document Capture's scan and commit.
    f. Click **OK**.

20.2.3.5 Configure Oracle Document Capture Import Server for Importing Images from E-Mail

To set up the Oracle Document Capture Import Server to import invoice images that are received through e-mail and to capture additional attributes for routing based on information in the e-mail subject, perform the following steps.

To configure additional routing attributes, do the following:

1. If the Automated Invoice Processing components are being installed for the first time, you already have the latest cabinet files, skip the unzip and import steps and proceed to Step 2. Otherwise, if Automated Invoice Processing is being used already, perform the following steps to import the latest cabinet files:

a. Unzip the **Capture-FormsRec_FA.zip** package.

b. Import the **ApInvoiceOdcCabinet.zip** and **ApInvoiceOfrCabinet.zip** files using the Document Capture Import Export utility.

2. (Optional) Perform Step 11 in Configure Additional Routing Attributes for Manual Scanning (page 20-13) to change the maximum lengths of the index attribute fields.

To configure the Email Provider batch job, do the following:

1. Open the Oracle Document Capture Import Server.
2. Select **Setup - Batch Jobs**.
3. Expand the **Email Provider** folder.
4. Select the **AP Email Provider** batch job.
5. If Oracle Forms Recognition is not being used, perform the following steps, otherwise proceed to Step 6.

   a. Select the **General** tab.

   b. In the **File Cabinet** field, select **Payables Invoice without OFR**.

   c. In the Server Macro field, select **<NONE>**.

   d. Select the **Processing** tab.

   e. Uncheck the **Commit Batches** option.
6. Select the **Image Output** tab. The default resolution is set to 300 x 300.

   Do not modify this setting.
7. Select the **Email Provider Settings** tab.
8. Select the **Email Accounts** subtab.

   a. In the **Email Protocol** field, select the e-mail protocol that is being used.

   b. In the **Email Server Name** field, specify the DNS name that the e-mail server uses.

   c. In the **Email Addresses to Process** field, enter the e-mail addresses that are designated to process scanned invoices.
9. Select the **Email Filters** subtab.

   a. Configure the settings in the **Process Emails** containing specified text area.

      Specify the e-mail text that the Oracle Document Capture Import Server must find to process an e-mail. If the designated e-mail account is responsible only for receiving scanned invoices, this section can be left blank.

   b. Configure the settings in the **Attachment Processing** area to process the invoice image attachments.
10. Select the **Post-Processing** subtab.

    a. In the **Upon Successful Import** area, select the action to take when the import process succeeds.

       The default setting is to delete the message from the e-mail account.

    b. In the **Upon Failed Import** area, select the action to take when the import process fails.

The default setting is **Don't Delete Message**, which leaves the failed imported invoices in the e-mail account.

11. Click **Close**.

To schedule the Email Provider batch job, do the following:

1. Select **Server - Schedule**.
2. Click **Schedule New Event**.
3. In the **Event** field, select **Email Provider - AP Email Provider**.
4. In the **Event Properties** area, specify the intended frequency.

   The recommended frequency setting is **Every 1 Minute**.
5. Select **Server - Activate** to run the job.

20.2.3.6 Install Oracle Forms Recognition for Payables

Install Oracle Forms Recognition for Payables on two different servers, one server each for:

- The Runtime Service: The instance of Oracle Forms Recognition for the Runtime Service must be installed on a secure server accessible only to administrators. The Runtime Service normally runs without any user intervention. However, administrators need to access the Runtime Service to perform setup and configuration tasks.
- The Designer and Verifier: The instance of Oracle Forms Recognition for the Designer and Verifier needs to be installed on a server that is accessible to the users of the applications.

To install Oracle Forms Recognition, perform the following steps:

1. On the Oracle WebCenter Capture and Forms Recognition for Fusion Financials Setup window, in the Oracle Forms Recognition region, click **Install**. The Oracle Forms Recognition installer appears.

   While installing it on each server, ensure to select the Complete install option.
2. Proceed through the installation steps to complete the installation. Once the installation is complete, the Setup utility initiates an additional process to install a patch, if any.
3. Proceed through the options to complete the patch installation. After it is complete, the Configure button in the Oracle Forms Recognition region is enabled.

20.2.3.7 Configure Oracle Forms Recognition for Payables

To configure Oracle Forms Recognition for Payables, perform the following steps:

1. On the Oracle WebCenter Capture and Forms Recognition for Fusion Financials Setup window, in the Oracle Forms Recognition region, click **Configure**. The Oracle Forms Recognition Runtime Server Creation dialog box appears.

   The Oracle Forms Recognition Runtime Server Creation dialog box appears if Oracle Forms Recognition has been installed for the first time. If Oracle Forms Recognition is already available and was earlier configured, the Oracle Forms Recognition Runtime Server Creation dialog box is skipped and the Oracle Forms

Recognition Configuration Utility dialog box appears. The instructions here are provided assuming that Oracle Forms Recognition is installed for the first time.

2. On the Oracle Forms Recognition Runtime Server Creation dialog box, select one of the options to create the Runtime Service:
   - All (Import, OCR, Classification, Extraction, Export and Clean-up) to create and configure a single instance of the Runtime Service that performs all Oracle Forms Recognition workflow operations. This is the default option and is normally reserved for use by demonstration systems.
   - Custom to customize the creation of the Runtime Service based on several parameters as described here:
   - For production environments, Oracle recommends to create separate Runtime Service instances for each function using the Custom options described in the following table. To increase system capacity, add additional instances of OCR, Classification and Extraction Runtime Service.
   - To create separate instances for each function, create all of them at this point. This dialog box is available only during first time installation. It is not possible to access it later to add Runtime Service instances. To add instances later, create each of them manually.

Sub-option	Functional Description
Import	Selecting this checkbox creates an import enabled instance of the Runtime Service.
OCR, Classification and Extraction	Selecting this checkbox creates an OCR, Classification and Extraction enabled instance of the Runtime Service.
Number of Instances	Specify the number of OCR, Classification and Extraction enabled instances to be created. The default value is 1. An OCR, Classification and Extraction enabled instance is CPU intensive and therefore, to balance higher invoice loads, create additional instances. However, it is recommended that the number of such instances must not exceed the number of cores on the server. Add additional instances using the SET file created by the Setup utility. The SET file name is FusionAP - OCE.set, which is located in the Bin folder of the Forms Recognition install folder, for example `C:\Program Files\Oracle\Forms Recognition\Bin`.
Export and Clean-up	Selecting this checkbox creates an Export and Clean-up enabled instance of the Runtime Service.

3. Click **OK**. The Oracle Forms Recognition Runtime Server Creation dialog box closes and the Oracle Forms Recognition Configuration Utility dialog box appears.
4. In the **AP Solution INI File** field, ensure that the path is set to the automatically installed INI file.
5. In **Database Connections**, ensure that at least one connection is selected. In absence of a Database Connection, click **Create** to create a database connection. Ensure that the selected database connection has read-only access to the Fusion schema.
6. From the **ODBC System DSN (32-bit)** list, select one of the predefined ODBC System DSN value. If the list is blank, create an ODBC System DSN using the ellipsis button next to the field. Ensure that the ODBC connection has read-only access to the Fusion schema.

7. Enter the User ID and Password associated with the selected ODBC System DSN.
8. Click **Test Connections** to ensure that the selected database connection is active and working.
9. In the **PO Format** field, enter the format of the purchase order.

   Use # as a wildcard character to represent a single number and @ as a wildcard character to represent a single alphabet.
10. In the **Ignore Characters** field, specify the characters such as comma, hyphen, period that may appear as part of the purchase order but need to be ignored. The ignore characters are always associated with a PO format.
11. Click **Add**. The PO format is added to the Defined Formats list, while simultaneously storing the associated characters to be ignored when that PO format is in use.

For more information on PO Formats see the *AP Solution Guide* located at `<Drive Letter>:\OFR_Projects\AP.`

20.2.3.8 Configure Shared Drive Access for Oracle Forms Recognition Runtime Service Manager

The Oracle Forms Recognition runtime service manager processes invoice images and exports them to a shared network drive. By design, Windows services are not allowed to access mapped network drives. Therefore, to access a network share, a Windows service must be running as an authenticated Windows user and it must access the share by specifying a UNC style path (`\\server_name\share_name`).

Subsequently, assign a Windows user profile to the Oracle Forms Recognition Runtime Service Manager. The specified user profile must have read/write access to the shared network drive.

1. On the server that hosts the Runtime Service, navigate to **Start**, then **Control Panel**, and then **Administrative Tools**.
2. Select **Services**.
3. Right-click **Oracle Forms Recognition Runtime Service Manager** and select **Properties**.
4. Select the **Log On** tab.
5. Select the **This account** radio button, and enter the user name and password of the user granted read/write access to the shared network folder.
6. Click **Apply** and then click **OK**.

20.3 Oracle Fusion Advanced Collections Dunning

Oracle Fusion Advanced Collections Dunning feature utilizes Oracle Business Intelligence Publisher to distribute dunning letters to customers via E-mail, fax or print. To use this feature, configure Oracle Business Intelligence Publisher to connect to the deploying company's internal E-mail, or the print or fax servers.

20.3.1 Add the E-Mail Server

To add an E-Mail server:

1. From the **Admin** page select **E-mail**. This displays the list of servers that have been added. Select Add Server.
2. Enter the Server Name, Host, and Port for the E-mail server.
3. Select a Secure Connection method to use for connections with the E-mail server. The options are: **None** or **SSL**. Use Secure Socket Layer. TLS (Transport Layer Security). Use TLS when the server supports the protocol; SSL is accepted in the response. TLS Required. If the server does not support TLS, then the connection is not made.
4. Optionally enter the following fields if appropriate: General fields; Port Security fields User name and Password.

20.4 Enable Encryption of Sensitive Payment Information

Financial transactions contain sensitive information which must be protected by a secure, encrypted mode. To protect the credit card and external bank account information, enable encryption. Encryption encodes sensitive data so that it cannot be read or copied. To enable encryption, create a wallet file. A wallet file is a digital file that stores the primary encryption key, which the application uses to encrypt sensitive data.

To secure the credit card or bank account data, navigate to the Setup and Maintenance work area, search for the Manage System Security Options task and perform the following steps:

1. Open the **Manage System Security Options** page
2. Click `Apply Quick Defaults`
3. Select all the check boxes:
   - Automatically create wallet file and encryption key
   - Encrypt credit card data
   - Encrypt bank account data
4. Click `Apply`

20.5 Configure a Communication Channel to a Payment System

To transmit payment information to or receive payment information from a payment system, configure the channel used to communicate with the payment system. The concepts related to configuring a communication channel to a payment system are:

- Proxy Server (page 20-19)
- Secure Sockets Layer Protocol (page 20-20)
- Unsecure Protocols (page 20-20)

20.5.1 Proxy Server

Payments must communicate through a proxy server to its payment system. Use the standard Java networking proxy system properties that are in the configuration

files when Oracle Fusion Applications were initially set up. Alternatively, specify proxy settings for a transmission protocol on the Create Transmission Configuration page by entering a value for the Proxy Host parameter.

20.5.2 Secure Sockets Layer Protocol

When Payments communicates with a payment system, the information exchanged may be sensitive, such as credit card numbers. If the communication isn't secure, it poses a security risk. The security risk increases when communication tot he payment system is across a public network such as the Internet.

To set up a payment system servlet with a secured sockets layer, enable HTTPS on the middle-tier server where the servlet resides. If funds-capture-process profiles are not defined for the payment system, change the `Transmission Servlet Base URL` parameter on the Edit Payment Systems page to start with HTTPS. If funds capture process profiles are defined, change the value for the `Destination URL` parameter on the Edit Transmission Configuration page to start with HTTPS.

For secure communication with the payment system, ensure that the most current certification authority (CA) certificates are in the Fusion secure sockets trust store file. If Payments rejects the payment system's secure sockets certificate, it might be necessary to insert the certificates manually.

The following table shows security actions which are applicable to Cloud and on-premise:

Table 20-1 Security Actions Applicable to Cloud and On-Premise

Action	Cloud	On-Premise
Set up a payment system servlet with a secure sockets layer (SSL)	Not applicable	Enable SSL on the servlet's application server
Insert certification authority certificates	File a service request with the help desk	Enter a value in the `Value` field for the `Wallet Location` parameter on the Create or Edit Transmission Configuration page

20.5.3 Unsecure Protocols

The preferred file-based transmission protocol is Secure File Transfer Protocol (SFTP). File Transfer Protocol (FTP) is unsecured and should only be used to meet legacy third-party requirements. FTP must be used over a secure link such as a virtual private network (VPN) or a leased line with data link level encryption enabled.

20.6 Configure Oracle B2B Inbound Flow to Receive Supplier Invoices in XML

Oracle B2B Server is an Oracle SOA Suite component that manages interactions between deploying companies and trading partners such as suppliers. Oracle Fusion Payables supports an inbound Oracle B2B flow using Oracle B2B Server for receiving invoices from suppliers in XML format.

This task is not applicable to Oracle Cloud implementations.This task is not applicable to Oracle Cloud implementations.

Trading partners can use this B2B feature to communicate electronically by sending documents in XML format. The B2B XML invoices use the same XML standard 171_Process_Invoice_002 (version 7.2.1) developed by the Open Applications Group (OAG). For more information on B2B XML Invoices, see B2B XML Invoices: How They Are Processed in the *Oracle Fusion Applications Procurement, Payables, Payments, and Cash Guide*.

Customers or deploying companies who want to receive and process invoices in XML format (complying to OAG standards) that are provided by the suppliers, need to perform the following post-installation configurations.

- Host Company Configuration
- Supplier Configuration

These configurations are required only if customers or deploying companies want to use the B2B XML invoice feature.

20.6.1 Configure the Host Company

Perform the following steps to complete Host Company configuration.

1. Set up the Oracle B2B Server.
2. Set up Oracle Supplier Network for the Host Company

   This step is required only if customers use Oracle Supplier Network as the communication channel.
3. To set up the Oracle B2B Server, do the following:
   a. Create a supplier trading partner.

      The Oracle B2B Server is preloaded with the supported OAG document schemas and sample trading partners such as MyCompany which is the host company trading partner, and ApSampleTradingPartner which is the supplier trading partner. However, it is possible to create the supplier trading partners as instructed here.

      - Log in to the Oracle B2B Server.

      - On the left, click **Add** on the Partner toolbar. The Partner Name dialog box appears.

      - Enter the name of the trading partner and click **OK**. A confirmation message appears. The new supplier trading partner is listed in the Partner region.

      - On the **Documents** tab, click **Add** to add a document definition for the supplier trading partner. The Select Document Definition dialog box appears.

      - Select OAG - 7.2.1 - PROCESS_INVOICE_002 - OAG_DEF and click **Add**. The document definition is added to the supplier and is displayed under Documents.

      - For the document definition, clear the checkbox under **Receiver**.

      - In the **Partner** region, select the new supplier trading partner, and on the **Agreement** toolbar, click **Add** to add a new agreement between the host company and the new supplier trading partner.

- Enter the name of the agreement.

- On the process train, click the **Select Document Definition** train stop. The Select Document Definition dialog box appears.

- Select the PROCESS_INVOICE_002 document definition mapped to the supplier trading partner and click **OK**.

- Under **Agreement Parameters**, ensure that the Functional Ack checkbox is clear, and click **Save**.

- To validate the agreement, click **Validate**.

- Click **Deploy**. An information message appears, indicating successful deployment of the agreement.

b. Set up a listening channel.

   Oracle B2B Server supports multiple protocols for sending/receiving messages between trading partners. Choose a protocol that is best suited for your company. Refer to the Oracle B2B Server documentation or online help to learn about each protocol and which parameters need to be set up. Listening channel can be set up at the global level (applicable to all trading partners) or at the trading partner level.

   Do one of the following:

   - Click **Administration** to set up a global listening channel and click the Listening Channel tab.

   - Click **Partners** to set up a trading partner listening channel and click the Channels tab.

   - Do not set up a listening channel if Oracle Supplier Network is used by the suppliers to send the B2B invoice payload.

   When Oracle Supplier Network is used, the only required setup to communicate with the supplier trading partner is to add a Generic Identifier on the B2B Server, using the Trading Partner Alias of the supplier as the value of the identifier. The Trading Partner Alias of suppliers is defined on the Trading Partners tab of the host company trading partner in the Oracle Supplier Network. The Generic Identifier entry is added to the Identifiers table on the Profile tab of the trading partner page.

   Save the changes to complete the set up.

4. Set up Oracle Supplier Network for the Host Company if the supplier uses Oracle Supplier Network to send the B2B invoice payload. To complete the setup, perform the following:

   a. Log in to the Oracle Supplier Network using the registered account.

   b. **Access Messaging - Communication Parameters** and select **HTTPS URL Connection as the Delivery Method**.

   c. Click **Modify** to update the delivery method parameter values.

   d. Enter the URL of the B2B HTTP receiver. Consult the system administrator if the value is unknown.

   e. Enter the User ID and password for Oracle Supplier Network.

      Different values for the Test and Production environments can be specified.

   f. Access **Messaging - Transaction Management**.

g. Add the OAG PROCESS_INVOICE_002 document from the list of available documents if it is not already added.

h. From the **Action** drop down list, select Receive.

i. From each **Delivery Method** drop down list (OSN Test Delivery Method and OSN Production Delivery Method), select HTTPS URL Connection and click **Submit**.

j. On the **Trading Partners** tab, in the **Add Trading Partners** region, click **Add** to add supplier trading partners. It is possible to add all the supplier trading partners who send invoice payloads to the host company.

5. Set up the B2B Site Code.

   For each supplier site that is enabled for B2B communication, the host company assigns a B2B Site Code to the site and communicates it to the supplier. Supplier has to provide this B2B Site Code in the invoice payload in the <PARTNER><PARTNRIDX> element, with <PARTNER><PARTNRTYPE> = Supplier within the <INVHEADER> element. To assign a B2B Site Code to a supplier site, navigate to the Manage Suppliers UI in the Fusion application. Search for the supplier and then open the supplier site. Enter a value into the B2B Supplier Site Code. Click **Save**. This code needs to be communicated to the suppliers manually so that they can include it in their invoice payloads.

   To assign a B2B Site Code to a supplier site, do the following:

   a. In Oracle Fusion Applications, access **Suppliers - Manage Suppliers**.

   b. Search for the specific supplier and open the relevant supplier site.

   c. On the **Edit Site** tab, in the **B2B Trading Partner Information** region, enter the site code (the site code set by the host company in Oracle B2B Server) in the B2B Supplier Site Code field.

   d. Click **Save**.

   Communicate the same site code to the suppliers.

20.6.2 Configure the Supplier

The following configuration steps must be performed by suppliers if they are using Oracle Supplier Network to send the invoice payload.

1. Log in to the Oracle Supplier Network using the registered account.
2. Navigate to **Messaging - Communication Parameters** and select **HTTPS URL Connection** as the **Delivery Method**.
3. Click **Modify** to update the delivery method parameter values.
4. Enter the URL of the B2B HTTP receiver.
5. Enter the User ID and password for Oracle Supplier Network.

   Different values for the Test and Production environments can be specified.

6. Navigate to **Messaging - Transaction Management**.
7. Add the OAG PROCESS_INVOICE_002 document from the list of available documents if it is not already added.
8. From the **Action** drop down list, select Send.

9. From each **Delivery Method** drop down list (OSN Test Delivery Method and OSN Production Delivery Method), select HTTPS URL Connection and click **Submit**.
10. On the **Trading Partners** tab, in the **Add Trading Partners** region, click **Add** to add host company trading partner.

20.7 Set Up Oracle B2B to Send Receivables Transactions in XML

Oracle B2B Server is an Oracle SOA Suite component that manages interactions between deploying companies and trading partners. Oracle Fusion Receivables supports an outbound Oracle B2B flow using Oracle B2B Server to send transactions to customer trading partners in XML format.

The setup of the Oracle B2B flow for Receivables makes use of these existing elements:

- XML Schema document guideline
- OAG-7.2.1-PROCESS_INVOICE_002-OAG_DEF document definition
- Host trading partner MyCompany

To set up Oracle B2B to send Receivables transactions in XML:

- Configure the host and remote trading partners
- Configure agreements between the host and remote trading partners

20.7.1 Configure Trading Partners

Configure the enterprise as the host trading partner, and all of the customers that receive XML documents as remote trading partners.

To configure trading partners:

1. Log in to the Oracle B2B Server.
2. Navigate to the **Administration** page.
3. Click the **Document** tab.
4. Load the OAG-7.2.1-PROCESS_INVOICE_002-OAG_DEF document definition file.
5. Click the **Types** tab.
6. Add a new Internal Identifier with the name B2B Trading Partner Code.

   This name matches the field name on the customer account profile.
7. Navigate to the **Partners** page.
8. In the **Partner** regional area, select the default host partner MyCompany.
9. If necessary, update the default host partner name to reflect the enterprise.
10. Click the **Documents** tab.
11. Verify that the OAG-7.2.1-PROCESS_INVOICE_002-OAG_DEF document definition is assigned to the host trading partner.
12. Ensure that the Sender option is enabled.

13. In the **Partner** regional area, click the **Add** icon.
14. Enter the name of a remote trading partner.
15. Select the Internal Identifier Type B2B Trading Partner Code previously created and enter the Value for the identifier.

    This is the value that entered in the B2B Trading Partner Code field on the customer account profile of this remote trading partner.
16. Click the **Documents** tab.
17. Click the **Add** icon to associate the OAG-7.2.1-PROCESS_INVOICE_002-OAG_DEF document definition with the remote trading partner.
18. Enable the **Receiver** option.
19. Click the **Channel** tab.
20. Define a channel for the remote trading partner.

    The channel determines how the XML transaction is delivered to the remote trading partner from B2B: directly; via the Oracle Supplier Network (OSN), or via a third party.

    If Oracle Supplier Network (OSN) is used to communicate, select the Generic Identifier and enter the IP Address of the OSN machine.
21. Repeat steps 13 to 20 for each remote trading partner.

20.7.2 Configure Agreements

A trading partner agreement defines the terms that enable two trading partners, the sender and the receiver, to exchange business documents. The agreement identifies the trading partners, trading partner identifiers, document definitions and channels.

An agreement consists of two trading partners, the host trading partner and one remote trading partner, and represents one type of business transaction between these partners. For example, if the host trading partner MyCompany and the remote trading partner ABC Solutions regularly exchange both purchase orders and invoices, then two separate agreements are needed for each document definition.

To configure agreements between the host and remote trading partners:

1. Log in to the Oracle B2B Server.
2. Navigate to the **Partners** page.
3. In the **Agreement** regional area, click the **Add** icon to open a new agreement for the host trading partner MyCompany.
4. Enter the agreement ID and Name.
5. Enter the agreement parameters.
6. Select the Document Definition OAG-7.2.1-PROCESS_INVOICE_002-OAG_DEF for this agreement.
7. Select the remote trading partner to include in this agreement.
8. Select the channel for the remote trading partner.
9. Add identifiers for the remote trading partner.
10. Click **Save** to save the agreement.

11. Click **Validate** to validate the agreement.
12. Click **Deploy** to deploy the agreement.

    Deployment is the process of activating an agreement from the design-time repository to the run-time repository.
13. Repeat steps 3 to 12 for each agreement between the host trading partner and this remote trading partner.

20.8 Next Steps

If the Fusion Accounting Hub product offering has been installed, go to Complete Oracle Fusion Applications Accounting Hub Post-Installation Tasks (page 21-1). Otherwise, go to the section that corresponds to the product offering that is installed.

21

Complete Oracle Fusion Applications Accounting Hub Post-Installation Tasks

This section describes the Oracle Fusion Applications Accounting Hub post-installation tasks that should be reviewed and completed before starting working with an Oracle Fusion Applications Fusion Accounting Hub implementation.
This section contains the following topics:

- Set Up the Financial Reporting Center (page 21-1)
- Integrate with Other Products (page 21-1)
- What To Do Next (page 21-3)

21.1 Set Up the Financial Reporting Center

To setup the Financial Reporting Center, follow the steps detailed in Set Up the Financial Reporting Center (page 20-1).

21.2 Integrate with Other Products

Oracle Fusion Applications provides a coexistence strategy that allows to continue to use the Oracle E-Business Suite or Oracle PeopleSoft General Ledgers and subledgers while using Oracle Fusion Applications Accounting Hub for financial reporting.

21.2.1 Integrate with Oracle E-Business Suite and Oracle PeopleSoft: Overview

Coexistence includes the ability to transfer balances from the Oracle E-Business Suite General Ledger and journal entries from Oracle PeopleSoft General Ledger to the Oracle Fusion Applications Accounting Hub.

For more information on completing the post-installation setup for coexistence with Oracle E-Business Suite General Ledger see:

- Details in *Configuring Oracle Golden Gate to Integrate the E-Business Suite Ledger with Fusion Accounting Hub* on My Oracle Support.
- Define Applications Coexistence Configuration for E-Business Suite in the *Oracle Fusion Accounting Hub Implementation Guide*
- Integrating with Oracle Fusion Applications in the *Oracle General Ledger Implementation Guide Release 12.2*: This guide contains information about loading and transferring data from Oracle E-Business Suite to the Oracle Fusion Applications Accounting Hub.

For more information on completing the post-installation setup for coexistence with Oracle PeopleSoft General Ledger, see:

- Define Applications Coexistence Configuration for PeopleSoft in the *Oracle Fusion Accounting Hub Implementation Guide*
- Integrating PeopleSoft General Ledger with Oracle Fusion Accounting Hub in*PeopleSoft General Ledger 9.1 Documentation Update*

The Oracle Data Integrator (ODI) component (extract file for manual import) is currently available via My Oracle Support only in note id: 1365971.1.

21.2.1.1 Register Applications Coexistence Instances

Register applications coexistence instances to indicate in Oracle Fusion General Ledger which Oracle E-Business Suite and Oracle PeopleSoft instances are integrated with the Oracle Fusion Applications Accounting Hub. A user interface enables to perform this registration. For each E-Business Suite or PeopleSoft instance, provide a unique system identifier. This identifier must also be registered in the corresponding Oracle E-Business Suite or Oracle PeopleSoft instance.

Specify a unique journal source per instance. For Oracle E-Business Suite, limit which instance and balancing segments may post to a particular Oracle Fusion General Ledger.

For Oracle E-Business Suite, determine the Function ID to move data from Oracle Fusion General Ledger to Oracle E-Business Suite General Ledger. Include the Function ID at the end of the drill down URL that is provided during the registration of the Oracle E-Business Suite instance.

To find the Oracle E-Business Suite Function ID:

1. Login as a System Administrator and navigate to the Function page.
2. Query for the function name: GL_FUSION_EBS_DRILL.
3. From the Help menu, click **Diagnostics**, and then click **Examine**.
4. Select the **FUNCTION_ID** field. The value box shows the value of the Function ID.

For Oracle E-Business Suite: The URL format for the non-dynamic portion needs to be in the following format: `http://<domain>:<port>/OAA_HTML/RF.jsp?function_id=<function_id>`.

In the above URL format, the `domain`, `port`, and `function_id` are for the Oracle E-Business Suite Instance.

For Oracle PeopleSoft: The URL format for the non-dynamic portion needs to be in the following format: `http://server/servlet_name/SiteName/PortalName/NodeName/c/PROCESS_JOURNALS.FUS_DRILLBACK_JRNL.GBL`

In the above URL format:

- `http://server/`: Scheme (http or https) and the web server name.
- `servlet_name/`: Name of the physical servlet that the web server invokes to handle the request.
- `SiteName/`: Site name specified during Oracle PeopleSoft Pure Internet Architecture setup.
- `PortalName/`: Name of the portal to use for this request.
- `NodeName/`: Name of the node that contains the content for this request.

21.2.2 How to Integrate with Data Relationship Management: Overview

Oracle Fusion Applications provides integration between Oracle Fusion Applications Accounting Hub and Oracle Hyperion Data Relationship Management. The integration is included with Oracle Fusion Applications Accounting Hub, Oracle Hyperion Data Relationship Management to store corporate charts of accounts values and hierarchies, and then update this information to both Oracle Fusion Applications Accounting Hub and the Oracle E-Business Suite General Ledger.

21.2.3 How to Integrate with Hyperion Planning: Overview

For Oracle Cloud implementations, integrate with on-premise Oracle Hyperion Planning for advanced budgeting by loading actual balances from Oracle Fusion Applications Accounting Hub to Oracle Hyperion Planning to use the actual data in the budgeting process. Load also budget data from Oracle Hyperion Planning to Oracle Fusion Applications Accounting Hub through the Budget Interface to perform budget variance reporting within Oracle Fusion Applications Accounting Hub.

For other implementations, Oracle Fusion Applications provides integration between Oracle Fusion Applications Accounting Hub and Oracle Hyperion Planning through Oracle Financial Data Quality Management ERP Integrator adapter.

21.3 Next Steps

If the Oracle Fusion Human Capital Management product offering has been installed, go to Complete Oracle Fusion Human Capital Management Post-Installation Tasks (page 22-1). Otherwise, go to the section that corresponds to the product offering that is installed.

22

Complete Oracle Fusion Human Capital Management Post-Installation Tasks

This section describes the Oracle Fusion Human Capital Management (Oracle Fusion HCM) post-installation tasks that should be reviewed and completed before starting working with an Oracle Fusion HCM implementation.
This section contains the following topics:

- Set Up Oracle Fusion Human Capital Management Coexistence (page 22-1)
- Recommended Memory Requirement for Oracle Fusion Human Capital Management Workforce Reputation Management Product (page 22-8)
- Create and Update an ISAM Vertex Database (page 22-9)
- What To Do Next (page 22-10)

22.1 Set Up Oracle Fusion Human Capital Management Coexistence

Oracle Fusion HCM Coexistence functionality enables the integration of the existing Oracle Human Resource applications with a hosted Oracle Fusion HCM implementation. As a result of the integration, use Oracle Fusion Workforce Compensation and Talent Management functionality alongside the existing setup.

Using Oracle Fusion HCM Coexistence, extract, transform, and transport files from PeopleSoft Enterprise or Oracle E-Business Suite and intelligently synchronize selected business object data between the source application and Oracle Fusion HCM applications. Refer to HCM Coexistence: Explained.

Setting up an implementation of Oracle Fusion HCM for Coexistence with an existing application involves the following procedures.

1. Ensuring that tokens are correctly replaced during Oracle Enterprise Scheduler Service deployment.
2. Setting up an FTP Server.
3. Setting up FTP Accounts.
4. Setting up SOA FTP Adapter.
5. Setting up Oracle Data Integrator.
6. Configuring the Oracle Web Services Manager for Interaction with the Source Application Web Services.
7. Setting up the HCM Configuration for Coexistence Parameters.

These procedures set up the connections in the Oracle Fusion environment to work with the source application. Therefore, set up the connections in the source application as well. The instructions for configuring the source application are in the following documents, which are available on My Oracle Support (MOS):

- Integrating PeopleSoft HRMS 8.9 with Fusion Talent Management and Fusion Workforce Compensation (Document ID 1480967.1)
- Integrating PeopleSoft HRMS 9.0 with Fusion Talent Management and Fusion Workforce Compensation (Document ID 1480995.1)
- Integrating PeopleSoft HRMS 9.1 with Fusion Talent Management and Fusion Workforce Compensation (Document ID 1480996.1)
- HCM Coexistence - Integrating EBS HCM 11i and Fusion Talent Management and Workforce Compensation (Document ID 1460869.1)
- HCM Coexistence - Integrating EBS HCM R12.1 and Fusion Talent Management and Workforce Compensation (Document ID 1460868.1)

22.1.1 Prerequisites

Use Oracle Fusion Applications Provisioning to provision a new Oracle Fusion Applications environment.

In addition to the components installed using Oracle Fusion Applications Provisioning, Oracle Fusion HCM Coexistence requires the following products to be installed.

- Adobe Reader
- Oracle Application Development Framework Desktop Integration (ADFDi)
- Microsoft Office 2007

22.1.2 Ensure Correct Token Replacement During Oracle Enterprise Scheduler Service Deployment

Ensure that Oracle Fusion HCM invokes the following services defined in the Oracle Enterprise Scheduler Service `connections.xml` file for `HcmEssApp`:

- `BulkLoadOdiInvoke` - ODI Agent
- `OdiAgentURLForHCM` - ODI Agent via ODI-ESS bridge
- All entries with the prefix BulkLoad* - HCM product services

Ensure that the service URLs of the entries above are replaced correctly during deployment. Ensure that the Protocol, Host and Port tokens are assigned valid values for the application domain.

22.1.3 Set Up an FTP Server

Oracle Fusion Applications Provisioning creates an FTP server and installs Oracle WebCenter. Ensure that the server is configured on port 20 and 21 and start the server.

22.1.4 Set Up FTP Accounts

Create two user accounts with read and write access, a generic user account to configure the FTP adapter and a user specific account for Oracle Fusion Applications.

For example, create user accounts with directory structure and permissions as shown in the following table.

User/ Usage	User Name (OS User)	Password	User Home Directory	Permissions	Comments
BPEL/ SOA	<bpel_username>	<bpel_password>	/fusion	Read and write for current directory and child levels only	User account used with Oracle Fusion SOA FTP Adapter configuration.
Customer 1	<customer1_username>	<customer1-pswd>	/fusion/E_<ENTERPRISE_ID>	Read and write for current directory and child levels only	The <ENTERPRISE_ID> corresponds to the Oracle Fusion Applications ID of Customer 1. The user account is used by the PeopleSoft Enterprise application interaction with the Oracle Fusion SOA/ BPEL process.

22.1.5 Set Up SOA FTP Adapter

Set up the following parameters of the SOA FTP adapter.

- Set the FTP server `hostname` in the FTP adapter connections properties file `weblogic-ra.xml`
- Set the FTP server operating system user name and password

To set the FTP server `hostname` and set the FTP server operating system user name and password in the FTP adapter connections property file, do the following:

1. Access `FtpAdapter.rar` which is available in the **Oracle_SOA1** directory structure on Oracle Weblogic Server (WLS) HcmDomain server file system.
2. Extract and save the `META-INF/weblogic-ra.xml` file to a temporary location.
3. Update the `META-INF/weblogic-ra.xml` file with appropriate values for the following connection properties:
   - `<wls:jndi-name>eis/Ftp/FtpAdapter</wls:jndi-name>`
   - `<wls:name>host</wls:name>`

     `<wls:value>ftpServerHostName</wls:value>`
   - `<wls:name>username</wls:name>`

     `<wls:value>ftpUserName</wls:value>`
   - `<wls:name>password</wls:name>`

     `<wls:value>ftpUserPswd</wls:value>`
4. Create an additional copy of `FtpAdapter.rar`.
5. Update `FtpAdapter.rar` with the updated `META-INF/weblogic-ra.xml` file. Run the following command:

```
zip -ur  /<path>/Oracle_SOA1/soa/connectors/FtpAdapter.rar META-INF/weblogic-ra.xml
```

6. Bounce the WLS HcmDomain.

22.1.6 Set Up Oracle Data Integrator

This section describes the prerequisites and steps required for setting up Oracle Data Integrator.

22.1.6.1 Prerequisites

Before setting up Oracle Data Integrator, ensure to complete the following:

- Oracle Data Integrator code is loaded using XML Import into a copy of the central template repository (id:500) using the FUSION_ODI schema.
- Topology entries are coming from the central template repository.
- Work repository (jdbc) is configured automatically to match the installation.
- Topology Java DataBase Connectivity (JDBC) entries for the database are configured automatically to match the installation.
- Installation uses the default FUSION and FUSION_ODI_STAGE schemas.
- Schemas FUSION and FUSION_ODI_STAGE are installed in the same database.
- The Oracle Data Integrator repository is in the same database as FUSION (schema: FUSION_ODI).
- Default context **Development** is used.
- Oracle Data Integrator console is available for configuration of the topology.

22.1.6.2 Set Up Oracle Data Integrator for Oracle Fusion Human Capital Management Coexistence

To set up Oracle Data Integrator for Oracle Fusion HCM Coexistence, complete the following procedures.

1. Create Oracle Data Integrator directories.
2. Validate Oracle Data Integrator topology settings.
3. Verify the configuration of the work repository.
4. Verify database connections.
5. Configure file technology connections.

22.1.7 Create Oracle Data Integrator Directories

Create manually and specify the directories and files to which Oracle Data Integrator has read and write access.

- For each enterprise, create an enterprise folder in the work directory.
- For the operating system user of the Oracle Data Integrator agent, create or specify directories for the items listed in the following table for Oracle Data Integrator use. The users must have full read and write access to the directories.

Oracle Data Integrator Directory Name	Item Description	Example Values
FILE_ROOT_HCM	Oracle Data Integrator base work directory	/home/ODI_ROOT_DIRECTORY
FILE_OUTPUT_HCM	Oracle Data Integrator export work directory	/home/ODI_ROOT_DIRECTORY/export
N/A	Enterprise directory name, where <eid> is the numeric enterprise id	/home/ODI_ROOT_DIRECTORY/E_<eid>

While creating the directory, ensure that the owner of the directory and the operating user of the Oracle Data Integrator agent are the same. The directory should be accessible from the Oracle WebLogic Server domain that runs the Oracle Data Integrator agent and the SOA process.

22.1.8 Validate the Topology Settings

After the directories have been created, use either Oracle Data Integrator Studio or Oracle Data Integrator Repository Explorer to validate the Oracle Data Integrator topology settings.

Configure or validate the following:

- Work repository connection
- Oracle technology (database) connections
- File technology connections

Use JDBC connection and credentials to validate and ensure that the connections refer to the correct database.

22.1.9 Verify the Configuration of the Work Repository

Use Oracle Data Integrator Studio to verify the work directories and repository configuration.

1. Navigate to **Topology**, then **Repositories**, and then **Work Repositories**.
2. Double-click **FUSIONAPPS_WREP**.
3. Verify that the work repository (jdbc URL) points to the Oracle Fusion Applications database.

22.1.10 Verify Database Connections

Verify that the JDBC data server URLs point to the Oracle Fusion Applications database.

1. Navigate to **Topology**, then **Physical Architecture**, and then **Oracle**.
2. Double-click the **ORACLE_FUSION** data server.

3. On the Definitions page, verify that the **Connection User** is FUSION_ODI_STAGE.
4. Enter the password.
5. In the **Instance/db link (Data Server)** field, enter the instance for the Oracle Fusion Applications database.

   Use the following format if the instance name is not registered with the Transparent Network Substrate (TNS) service: `<host>:<port>/<instance_name>`. If the instance name is registered with the TNS service, specify only the instance name.
6. Click **JDBC**.
7. Ensure that the URL in the **JDBC URL** field points to the Oracle Fusion Applications database.
8. Expand and open the child schema: **ORACLE_FUSION.FUSION**.
9. Ensure that the **Default** box is selected.
10. Verify that FUSION is entered as the value in the **Schema** field.
11. Verify that FUSION_ODI_STAGE is entered as the value in the **Work Schema** field.

Perform the same steps for the ORACLE_WORK_HCM data server. However, ensure that the value of both the schema and the work schema is FUSION_ODI_STAGE.

22.1.11 Configure File Technology Connections

The ODI work directories previously defined now need to be configured in the topology so that ODI can make use of them.

Using ODI Studio, configure files in topology.

1. Navigate to **Topology**, then **Physical Architecture** - **File**.
2. Double-click FILE_ROOT_HCM.
3. Verify that the value of **JDBC Driver** is com.sunopsis.jdbc.driver.file.FileDriver.
4. Verify that the value of **JDBC URL** is jdbc:snps:dbfile.
5. Expand and open the child physical schema.
6. For **Directory (Schema)**, provide the directory path defined for FILE_ROOT_HCM.
7. Provide the same value for **Directory (Work Schema)**.
8. Ensure that the **Default** box is selected.

Use the same steps to configure FILE_OUTPUT_HCM using the directory path for FILE_OUTPUT_HCM instead of FILE_ROOT_HCM.

22.1.12 Enable SQL*Loader for Oracle Data Integrator

Oracle Fusion HCM Coexistence Oracle Data Integrator uses SQL*Loader to import file data. Use the SQL*Loader in Oracle Data Integrator from the Oracle Weblogic Server environment to perform the following steps.

1. Determine the directory where the Oracle client software is installed for the deployment. The default name is `DBCLIENT` and it is placed in the parent directory of *MW_HOME*. Refer to this directory as `DBCLIENT ORACLE_HOME`.
2. Verify the existence of `DBCLIENT ORACLE_HOME/bin/sqlldr`.
3. Change the directory to *ODI ORACLE_HOME*`/bin`.
4. Create a script named `sqlldr` that contains the following:

```
#!/bin/sh
ORACLE_HOME=<DBCLIENT ORACLE_HOME>
export ORACLE_HOME
$ORACLE_HOME/bin/sqlldr $*
#
```

5. Make the script executable using the following command.

```
chmod +x sqlldr
```

22.1.13 Configure the Oracle Web Services Manager for Interaction with the Source Application Web Services

Configure the Oracle Web Services Manager certificate key with the user credentials for a Simple Object Access Protocol (SOAP) interaction with the source application Web services.

The user credentials correspond to the source application user with entitlement to invoke the source application Web service.

1. Log in to the Enterprise Manager Console as a Weblogic_Administrator user.
2. Access **HcmDomain** under the Weblogic Domain.
3. Open **Security** - **Credentials**.
4. Access and expand the key map oracle.wsm.security.
5. Click **Credential Key** to search for the key `FUSION_APPS_HCM_HR2HR_APPLOGIN-KEY`.
6. Click **Edit** to update the credentials.
7. Set the user name and password of the source application user.

22.1.14 Set up the HCM Configuration for Coexistence Parameters

After the FTP and Oracle Data Integrator directory paths have been created, set up the related parameters in Oracle Fusion HCM.

1. Log in to Oracle Fusion Applications.

   MANDATORY: The Oracle Fusion Applications user must have the appropriate roles to set up and configure Oracle Fusion applications. At least, ensure that the user is assigned the **View All** data role for the **HCM Application Administrator** job role. For details on setting up implementation users, see Define Implementation Users in the *Oracle Fusion Applications Coexistence for HCM Implementation Guide*.

2. Go to **Navigator** - **Tools** - **Setup and Maintenance** and perform the following tasks:

a. Find and initiate the **Manage HCM Configuration for Coexistence** task to bring up the **Manage HCM Configuration for Coexistence** parameters page.

b. Set up the following parameters.

Parameter	Description
On Demand FTP Root Directory	Mounted root directory of the server
ODI Context	The logical name for the group containing logical-to-physical mappings for connections in Oracle Data Integrator. The default value in Oracle Data Integrator is DEVELOPMENT. This value is case sensitive. Therefore, ensure that it is completely uppercase.
ODI User	The Oracle Data Integrator user name
ODI Password	The password associated with the Oracle Data Integrator user name
ODI Work Repository	The repository that contains the Oracle Data Integrator related code definitions. The default value in Oracle Data Integrator is `FUSIONAPPS_WREP`.
ODI Root Directory	The local directory where Oracle Data Integrator processes files and creates work and log files. It is the directory path defined for `FILE_ROOT_HCM`, when creating the Oracle Data Integrator directories.

It is possible now to implement Oracle Fusion Talent and Oracle Fusion Workforce Compensation using the Coexistence for HCM offering, available from the Setup and Maintenance work area of Oracle Fusion Applications.

22.2 Recommended Memory Requirement for Oracle Fusion Human Capital Management Workforce Reputation Management Product

This section is only applicable to use the Oracle Fusion HCM Workforce Reputation Management product packaged with the Workforce Deployment, or Workforce Development product offerings. To provision an environment with these two product offerings, see Select Product Offerings (page 12-2).

The physical machine hosting Oracle Fusion HCM Workforce Reputation Management (WorkforceReputationServer_1) Managed Server must have a minimum of 24 GB of memory. Allocate 8 GB of memory to the Oracle Fusion HCM Workforce Reputation Management (WorkforceReputationServer_1) Managed Server. The Oracle Fusion HCM Workforce Reputation Management externalization process may use up to 16 GB of memory.

To specify memory allocation for the Oracle Fusion HCM Workforce Reputation Management (WorkforceReputationServer_1) Managed Server:

1. Edit the `fusionapps_start_params.properties` file located under *`APPLICATIONS_CONFIG`*`/domains/<host>/HCMDomain/config`, by replacing the line:

   ```
   fusion.HCMDomain.WorkforceReputationCluster.default.minmaxmemory.main=
   -Xms512m -Xmx2048
   ```

with

```
fusion.HCMDomain.WorkforceReputationCluster.default.minmaxmemory.main=
-Xms4096m -Xmx8192m
```

2. Save the `fusionapps_start_params.properties` file.
3. Restart Oracle Fusion HCM Workforce Reputation Management (WorkforceReputationServer_1) managed server either from the WebLogic console or Enterprise Management for the Oracle Fusion HCM domain. See Perform Basic Administrative Tasks in the *Oracle Fusion Applications Administrator's Guide*.

22.3 Create and Update an ISAM Vertex Database

To successfully run the US or Canadian Payroll, create an Indexed Sequential Access Method (ISAM) database using the data file provided by Vertex. Once the ISAM database is created, process the data file each month to maintain accurate payroll results. Vertex makes the data file available on a monthly basis.

22.3.1 Create and Update an ISAM Database for Microsoft Windows

To create the ISAM database for Applications running on Windows, follow these instructions.

1. In the `environment.properties` file, ensure that the *$VERTEX_TOP* variable is set for the appropriate environment.
2. Copy the utility and library files under *$VERTEX_TOP*`/utils` and *$VERTEX_TOP*`/lib` and place them in a Windows local directory, such as `C:\Vertex_Util-Lib`.
3. Copy the latest Vertex data file (`qfpt.dat`) to the local directory used to create the ISAM database, such as `C:\Vertex_Data`.
4. From the local directory containing the utilities and library files (in this case `C:\Vertex_Util-Lib`), run `cbmaint`.
5. On the installer screen, select **Create Database** and **Payroll Tax Database**.
6. Provide the local directory path used to create the ISAM database (in this case, `C:\Vertex_Data`). The ISAM database files get created in this directory.
7. From the local directory containing the utilities and library files (in this case `C:\Vertex_Util-Lib`), run `vprtmupd` to populate the ISAM database files.
8. On the Installer screen, select **Update Payroll Tax Database**.
9. Provide the local directory path where the Vertex data file `qfpt.dat` is available (in this case `C:\Vertex_Data`).
10. Provide the directory path where ISAM database was created (in this case `C:\Vertex_Data`). The ISAM database files residing in this directory get updated. The update process takes some time.
11. Backup the database file and the related files under *$VERTEX_TOP*`/data`, if any, in case there is a need to revert to the earlier ISAM database.
12. Copy the ISAM database files and all related files from the local directory (in this case `C:\Vertex_Data`), and place then under *$VERTEX_TOP*`/data`.

13. Provide users with complete permissions to all files under *$VERTEX_TOP*/data.

The ISAM database is available for use by the US Payroll application and the Canadian Payroll application.

22.3.2 Create and Update an ISAM Database for UNIX

To create the ISAM database for application running on UNIX, follow these instructions.

1. Set the environment variable LD_LIBRARY_PATH as the value of *$VERTEX_TOP*/lib.
2. Backup the database file and the related files under $VERTEX_TOP/data, if any, in case there is a need to revert to the earlier ISAM database.
3. Copy the latest Vertex data file (qfpt.dat) to $VERTEX_TOP/data.
4. From *$VERTEX_TOP*/utils, run cbmaint.
5. On the installer screen, select **Create Database** and **Payroll Tax Database**.
6. Provide the directory path used to create the ISAM database (in this case *$VERTEX_TOP*/data). The ISAM database files get created in this directory.
7. From the *$VERTEX_TOP*/utils, run vptmupd to populate the ISAM database files.
8. On the Installer screen, select **Update Payroll Tax Database**.
9. Provide the directory path where the Vertex Data file qfpt.dat is available (in this case *$VERTEX_TOP*/data).
10. Provide the directory path where ISAM database was created (in this case *$VERTEX_TOP*/data). The ISAM database files residing in this directory get updated. The update process takes some time.
11. Provide users with complete permissions ot all files under *$VERTEX_TOP*/data.

The ISAM databse is available for use by the US Payroll application and the Canadian Payroll application.

22.4 Next Steps

If the Oracle Fusion Incentive Compensation product offering has been installed, go to Complete Oracle Fusion Incentive Compensation Post-Installation Tasks (page 23-1). Otherwise, go to the section that corresponds to the product offering that is installed.

23

Complete Oracle Fusion Incentive Compensation Post-Installation Tasks

This section describes the Oracle Fusion Incentive Compensation post-installation tasks that should be reviewed and completed before starting working with an Oracle Fusion Incentive Compensation implementation.
This section contains the following topics:

- Integrate Oracle Fusion Incentive Compensation with Geo Map Server (page 23-1)
- What to Do Next (page 23-2)

23.1 Integrate Oracle Fusion Incentive Compensation with Geo Map Server

Oracle Fusion Incentive Compensation uses the functionality provided by the Geo Map server. Depending on the network connectivity where the application is installed and the available support for integration, it might be necessary to modify the MapViewer and GeoMapViewer connections.

Connect to the Geo Map server provided by Oracle.

If the firewall on the network blocks HTTP connections, the map server cannot be accessed.

To use a preferred map server or any other map server that is available on premise or on another network, modify certain Oracle Application Development Framework (Oracle ADF) connection properties for MapViewer and GeoMapViewer.

1. Log in to Oracle Enterprise Manager Fusion Applications Control.
2. In the left pane, navigate to **Oracle Fusion Incentive Compensation**, then **Fusion Applications**, then **IncentiveCompensationApp** and click the server to modify the ADF connection properties.
3. At the top of the page, from the **Fusion J2EE Application** context menu, select **ADF**, then select **Configure ADF Connections**.
4. On the ADF Connections Configuration page, go to the **URL Connections** section.
5. Select the **MapViewerURL** connection name and click **Edit**.
6. In the URL field, replace the default URL with the URL or location information of the preferred map server and click **OK**.
7. Repeat the steps to modify the URL for the **GeoMapViewer** connection name.

23.2 Next Steps

If an Oracle Fusion Project Portfolio Management product offering has been installed, go to Complete Oracle Fusion Project Portfolio Management Post-Installation Tasks (page 24-1). Otherwise, go to the section that corresponds to the product offering that is installed.

24

Complete Oracle Fusion Project Portfolio Management Post-Installation Tasks

This section describes the Oracle Fusion Project Portfolio Management post-installation tasks that should be reviewed and completed before starting working with an Oracle Fusion Project Portfolio Management implementation.
This section contains the following topics:

- View Summarized Revenue and Invoice Amounts After Data Migration (page 24-1)
- What to Do Next (page 24-1)

24.1 View Summarized Revenue and Invoice Amounts After Data Migration

Run the **Update Project Contract Performance Data** process to display summarized revenue and invoice amounts after migrating revenue and invoice data from existing applications to Project Financial Management applications.

24.2 Next Steps

If the Oracle Fusion Supply Chain Management product offering is installed, go to Complete Oracle Fusion Supply Chain Management Post-Installation Tasks (page 25-1). Otherwise go to What To Do Next (page 26-1) to complete the required functional and implementation tasks before starting using the Oracle Fusion Applications setup.

25

Complete Oracle Fusion Supply Chain Management Post-Installation Tasks

This section describes the Oracle Fusion Supply Chain Management post-installation tasks that should be reviewed and completed before starting working with an Oracle Fusion Supply Chain Management implementation.
This section contains the following topics:

- Install Oracle Enterprise Data Quality for Product Data Oracle DataLens Server (page 25-1)
- What to Do Next (page 25-2)

25.1 Install Oracle Enterprise Data Quality for Product Data Oracle DataLens Server

Oracle Enterprise Data Quality for Product Data is built on industry-leading DataLens Technology to standardize, match, enrich, classify, and correct product data from different sources and systems. For Oracle Fusion Product Hub to use Oracle Enterprise Data Quality for Product Data features, establish a connection between them.

For more information on installing and using Oracle Enterprise Data Quality for Product Data Oracle DataLens Server, see Preparing for Installation in the *Oracle Enterprise Data Quality for Product Data Oracle DataLens Server Installation Guide*. For more information on implementation, see Getting Started in the *Oracle Enterprise Data Quality for Product Data R12 PIM Connector Installation Guide*.

25.1.1 Establish a Connection

After installation, use the Oracle Enterprise Manager to establish or modify the connection with the Oracle DataLens Server.

1. Log in to an Oracle Fusion Middleware farm using Oracle Enterprise Manager Fusion Applications Control.
2. Expand the Fusion Applications node under Oracle Fusion Supply Chain Management.
3. Right-click the application for which a connection will be established, for example, **ProductManagementApp**.
4. Select **ADF**, then **Configure ADF Connections** from the menu.
5. On the ADF Connections Configuration page, set the connection type as `URL` and the connection name as `DSAServerURL`.
6. Click **Create Connection**. The added connection appears under URL Connections.

7. Under URL Connections, select **Edit** `DSAServerURL` and provide the **URL** for Oracle DataLens Server.

   For example, the SOA Common Properties Server URL with `/datalens` appended to the URL such as `http://<host name>:port/datalens`.

8. Click **OK**.
9. Click **Apply**.
10. Set connections for **ProductManagementCommonApp** and **ScmEssApp** applications using Step 3 to Step 10.
11. For the changes to take effect, restart the Product Management, SCM Common, and ESS servers from the Weblogic Admin Console.

25.2 Next Steps

Go to What To Do Next (page 26-1) which describes the next steps to be completed.

26
Next Steps

This section describes implementation and functional tasks that must be completed before starting using an Oracle Fusion Applications setup.
This section contains the following topics:

- Manage User Passwords for Login Access to Applications Components (page 26-1)
- Complete Common User Setup Tasks (page 26-1)
- Enable Product Offering Functionality (page 26-1)
- Troubleshoot Tips for Runtime Issues (page 26-1)
- (Optional) Install Oracle Enterprise Manager Cloud Control (page 26-3)

26.1 Manage User Passwords for Login Access to Applications Components

For complete information about setting up and managing passwords for the new environment, see Secure Oracle Fusion Applications and Provision of Identities in the *Oracle Fusion Applications Administrator's Guide*.

26.2 Complete Common User Setup Tasks

For complete information about completing common user setup tasks needed to create an implementation project, optionally create initial implementation users, and set up the basic enterprise structure needed for implementing any and all Oracle Fusion Applications offerings see the *Getting Started with Oracle Fusion Applications: Common Implementation* posted on My Oracle Support (Doc ID 1387777.1).

26.3 Enable Product Offering Functionality

Before starting using any of the product offerings already installed, complete some common implementation tasks and enable the functionality of the offerings in the environment.

A large library of product-related documentation is available for use after provisioning. See Overview in the *Oracle Fusion Functional Setup Manager User's Guide*. See also the product-specific Oracle Fusion Applications implementation guides.

26.4 Troubleshoot Tips for Runtime Issues

Follow the instructions detailed in this section for resolving known runtime issues.

26.4.1 OutOfMemory Error Due to PermGen Space (Solaris)

Problem: An OutOfMemoryError due to PermGen space is reported on the SCMCommon WebLogic Managed Server in the Oracle Fusion Supply Chain Management domain for the Solaris x64 or Solaris Sparc platform.

Solution for Solaris x64

Perform the following steps to resolve this issue on the Solaris x64 platform.

1. Check the cluster name for the managed server where the PermGen exception is reported. The cluster name can be found from the Administration Server console for the Oracle Fusion Supply Chain Management domain.
2. Edit the *$DOMAIN_HOME*`/config/fusionapps_start_params.properties` file by performing the following steps.
   a. Identify the key/value pair which is `fusion.SCMCommonCluster.SunOS-i386.memoryargs` in `fusionapps_start_params.properties`.
   b. Duplicate the entire line containing the key/value pair of `fusion.SCMCommonCluster.SunOS-i386.memoryargs` and add this as a new line in `fusionapps_start_params.properties`.
   c. Comment the original line by adding a '#' at the beginning of the line.
   d. For the line added in **Step b**, change the default value in `fusion.SCMCommonCluster.SunOS-i386.memoryargs` by replacing 512m with 756m. This is what it should look like:

      ```
      fusion.SCMCommonCluster.SunOS-i386.memoryargs=-XX:PermSize=256m
      -XX:MaxPermSize=756m -XX:+UseParallelGC -
      XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=@HEAP_DUMP_PATH@
      -XX:+ParallelGCVerbose -XX:ReservedCodeCacheSize=128m -
      XX:+UseParallelOldGC -XX:ParallelGCThreads=4
      ```

   e. Bounce the Managed Server.

An example for `SCMCommonServer_1` for Solaris x64 follows.

1. `SCMCommonCluster` is the cluster name for `SCMCommonServer_1`.
2. Add the following entry:

   ```
   fusion.SCMCommonCluster.SunOS-i386.memoryargs=-XX:PermSize=256m

   -XX:MaxPermSize756m -XX:+UseParallelGC

   -XX:+HeapDumpOnOutOfMemoryError

   -XX:HeapDumpPath=path_for_heap_dump -XX:+ParallelGCVerbose

   -XX:ReservedCodeCacheSize=128m -XX:+UseParallelOldGC

   -XX:ParallelGCThreads=4
   ```

   In this example, the entry for `fusion.default.SunOS-i386.memoryargs` is already correct.

Solution for Solaris Sparc

Perform the following steps to resolve this issue on the Solaris Sparc platform.

1. Check the cluster name for the managed server where the `PermGen` exception is reported. The cluster name can be found from the Administration Server console for the Oracle Fusion Supply Chain Management domain.
2. Edit the *$DOMAIN_HOME*`/config/fusionapps_start_params.properties` file by performimg the following steps.
   a. Identify the key/value pair which is `fusion.SCMCommonCluster.SunOS-sparc.memoryargs` in `fusionapps_start_params.properties`.
   b. Duplicate the entire line containing the key/value pair of `fusion.SCMCommonCluster.SunOS-sparc.memoryargs` and add this as a new line in `fusionapps_start_params.properties`.
   c. Comment the original line by adding a '#' at the beginning of the line.
   d. For the line added in **Step b**, change the default value in `fusion.SCMCommonCluster.SunOS-sparc.memoryargs` by replacing 512m with 756m. This is what it should look like:

      ```
      fusion.SCMCommonCluster.SunOS-sparc.memoryargs=-XX:PermSize=256m
      -XX:MaxPermSize=756m -XX:+UseParallelGC -
      XX:+HeapDumpOnOutOfMemoryError -XX:HeapDumpPath=@HEAP_DUMP_PATH@
      -XX:+ParallelGCVerbose -XX:ReservedCodeCacheSize=128m -
      XX:+UseParallelOldGC -XX:ParallelGCThreads=4
      ```

   e. Bounce the Managed Server.

An example for `SCMCommonServer_1` for Solaris Sparc follows.

1. `SCMCommonCluster` is the cluster name for `SCMCommonServer_1`.
2. Add the following entry:

   ```
   fusion.SCMCommonCluster.SunOS-sparc.memoryargs=-XX:PermSize=256m

   -XX:MaxPermSize756m -XX:+UseParallelGC

   -XX:+HeapDumpOnOutOfMemoryError

   -XX:HeapDumpPath=path_for_heap_dump -XX:+ParallelGCVerbose

   -XX:ReservedCodeCacheSize=128m -XX:+UseParallelOldGC

   -XX:ParallelGCThreads=4
   ```

   In this example, the entry for `fusion.default.SunOS-sparc.memoryargs` is already correct.

26.5 (Optional) Install Oracle Enterprise Manager Cloud Control

Oracle Enterprise Manager Cloud Control (Cloud Control) is a system management software that delivers centralized monitoring, administration, and life cycle management functionality for the complete Oracle Fusion Applications IT infrastructure from one single console. For example, monitor all the Oracle WebLogic Server domains for all the product families from one console.

See Installing Oracle Enterprise Manager Cloud Control in the *Oracle Enterprise Manager Cloud Control Basic Installation Guide* and Getting Started in the *Oracle*

Enterprise Manager Cloud Control Advanced Installation and Configuration Guide for information about Cloud Control installation.

27

Extend an Oracle Fusion Applications Environment Using Incremental Provisioning During Upgrade

This section describes the process of extending an Oracle Fusion Applications environment using incremental provisioning when upgrading from a prior release as part of the upgrade process. For more information about upgrading from a prior release of Oracle Fusion Applications, see Introduction to Oracle Fusion Applications Upgrade in the Oracle Fusion Applications Upgrade Guide.

Incremental provisioning gives the ability to extend an Oracle Fusion Applications environment during the upgrade, by adding product offerings that are not already present. Add product offerings that are available for selection in the Provisioning Wizard, including those introduced in a later release.

To use incremental provisioning, an existing Oracle Fusion Applications environment created from a prior release is necessary. This environment is used for upgrading to the current release.

Use incremental provisioning if the Oracle Fusion Applications environment is a bare metal environment. This means that the environment was created by using the Provisioning Wizard from a prior release where the product offerings were selected and the Oracle Fusion Applications provisioning process described in the guide for that release was followed.

For example: To upgrade from Release 11 to 12, the Provisioning Wizard must have been used to select the product offerings and the Oracle Fusion Applications provisioning process, described in this guide, must have been followed to create the environment for Release 11.

Use incremental provisioning if the Oracle Fusion Applications environment is created from Oracle Fusion Applications Oracle VM templates of a prior release and to add product offerings during upgrading to this release. The available selection of product offerings are the ones newly introduced up to this release (excluding any that already existing in the OVM environment).

For more information about the list of product offerings included in each of the Oracle Fusion Applications Oracle VM templates, see Introduction to Oracle VM Installation in the the *Oracle Fusion Applications Installing and Managing in an Oracle VM Environment Guide*.

Incremental provisioning cannot be performed for an Oracle Fusion Applications environment created in a current release. This means that an Oracle Fusion Applications environment cannot be provisioned for Release 12, and then decide to perform incremental provisioning to add product offerings that were not selected using the provisioning repository from the same release.

During the upgrade from a prior release to Release 12, if the environment meets one of the conditions described in Conditions for manually performing the incremental provisioning task during the incremental provisioning pause point to add the FOS

offering (page 27-2), then perform the incremental provisioning task manually during the incremental provisioning pause point to add the FOS offering. If none of the conditions are true, then skip the incremental provisioning task. For more information about incremental provisioning pause point, see Pause Point 6 - Perform Incremental Provisioning in the *Oracle Fusion Applications Upgrade Guide*.

Conditions for manually performing the incremental provisioning task during the incremental provisioning pause point to add the FOS offering:

- Bare Metal environments: The Provisioning Wizard has been run to select product offerings and provision the environment on several hosts. The environment contains any one of these product offerings: Product Management, Order Orchestration, or Material Management and Logistics from Supply Chain Management, or Procurement from Financials.
- Oracle VM environments: An environment has been created from one of the Oracle Fusion Applications Oracle VM templates not managed by Oracle Cloud and the Oracle VM template used is GSI (available since 11 *g* Release 7 (11.1.7) or FSCMH (Financial, Supply Chain Management and Human Capital Management, available prior to 11 *g* Release 6 (11.1.6). If an HCM or CRM template is used, see Verify Environment Before Proceeding to Downtime in the *Oracle Fusion Applications Upgrade Guide*.

Bare Metal: An environment that does not include any software. In the context of Oracle Fusion Applications, this means a supported version of operating system must be installed in order for the computer system to be functional prior to provisioning Oracle Fusion Applications.

Oracle VM: An environment running on virtual servers. In the context of Oracle Fusion Applications, the supported virtualization technology is Oracle VM Manager. Installing an Oracle Fusion Applications Oracle VM template creates multiple Oracle VM servers running a version of Linux operating system that comes with the Oracle VM template on the virtual servers.

As described in Oracle WebLogic Server Domains (page 2-39), incremental provisioning is capable of creating a single Managed Server instance within a cluster. It does not provide scale out capability such as creating multiple Managed Server instance within a cluster. After incremental provisioning is complete, scale out Oracle Fusion Middleware components, such as Oracle HTTP Server and Oracle SOA Suite, and product domains, such as Oracle Fusion Customer Relationship Management domain, Oracle Fusion Common domain, Oracle Fusion Human Capital Management domain, and so on. For more information about scaling out capabilities, see Complete Conditional Common High Availability Post-Installation Tasks for Oracle Identity Management (page 17-1) and Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1).

This section includes the following topics:

- Introduction to Extending an Oracle Fusion Applications Environment Using Incremental Provisioning During Upgrade (page 27-3)
- Create an Extended Provisioning Response File (page 27-3)
- Perform Incremental Provisioning (page 27-10)
- Troubleshoot Incremental Provisioning (page 27-11)
- What To Do Next (page 27-13)

27.1 Introduction to Extending an Oracle Fusion Applications Environment Using Incremental Provisioning During Upgrade

Oracle Fusion Applications Provisioning orchestrates the physical installation and configuration of the product offerings selected and deploys those offerings and their dependent middleware components to a predetermined Oracle WebLogic Server Domain. To perform the installation tasks, Provisioning requires the provisioning repository of installers, the provisioning framework, and a response file.

When incremental provisioning is used to extend an existing Oracle Fusion Applications environment running a prior release, provisioning also requires the provisioning repository of installers, the provisioning framework, and a response file. During the upgrade process, Upgrade Orchestrator installs the provisioning framework by the time upgrade reaches a pause point if the `PERFORM_INCREMENTAL_PROVISIONING` property is set to true in the `pod.properties` file. At this time, proceed with creating an extended provisioning response file to be used by incremental provisioning.

The incremental provisioning process consists of the following two tasks:

- Creating an Extended Provisioning Response File

  An extended provisioning response file contains the same provisioning response when the Oracle Fusion Applications environment is initially provisioned, and any additional information provisioning needs to extend the Oracle Fusion Applications product offerings selected to be added. Instead of entering the same information again, incremental provisioning introspects the existing Oracle Fusion Applications environment and creates the extended provisioning response file. See Create an Extended Provisioning Response File (page 27-3).

- Performing Incremental Provisioning

  See Perform Incremental Provisioning (page 27-10).

27.2 Create an Extended Provisioning Response File

To create an extended provisioning response file, start the Provisioning Wizard and select the **Create a Response File for Extending an Existing Fusion Application Environment** option.

Complete the wizard interview screens and save the response file in a location that is accessible to the various installers. Record the location, as it must be supplied when performing incremental provisioning. Note that the extended provisioning response file should be created on the Primordial host, which is the host that contains the Administration Server of the Common domain.

When a response file is created, chose a provisioning configuration and incremental provisioning then takes through a series of interview screens to specify the configuration details for the product offerings and their dependent middleware components. Save the response file and specify its location when it is ready to be used to provision a new environment.

Currently updating an extended response file **is not supported**. To make changes to the extended provisioning response file, re-create an extended provisioning response file.

MANDATORY: Select only the **Create a Response File for Extending an Existing Fusion Application Environment** option during upgrade and follow the Upgrade Orchestration flow.

27.2.1 Before Starting the Provisioning Wizard

Confirm the following before starting incremental provisioning.

- Ensure that the existing Oracle Fusion Applications environment to be extended is active and running correctly.
- Ensure to complete the required upgrade tasks, including backing up the Oracle Fusion Applications environment as part of the upgrade process and are ready to extend the environment. For more information about backing up during the upgrade process, see Back Up Fusion Applications in the *Oracle Fusion Applications Upgrade Guide*.
- To add new provisioning host(s) to the environment, ensure the host(s) is/are prepared as described in Prepare for an Installation (page 5-1).

27.2.2 Start the Provisioning Wizard

The Provisioning Wizard supports the following command line options:

Table 27-1 Provisioning Wizard Command Line Options

Command Line Option	Description	Default Value
`-invPtrLoc [inventory pointer file name]`	Location of the `oraInst.loc` file.	`/etc/oraInst.loc`
`-ignoreSysPrereqs [true|false]`	Disables validation for database, schema and hosts. Most validation errors will be ignored. **Note:** `-ignoreSysPrereqs true` is the same as `-ignoreSysPrereqs` with no value specified.	false
`-help`	Displays help text.	

Usage:

```
provisioningWizard.sh -invPtrLoc <inventory pointer location file>

-ignoreSysPrereqs {true|false}

-help
```

To start the Provisioning Wizard, do the following on the primordial host:

1. Set the *JAVA_HOME* environment variable to point to the JDK location in the provisioning repository, for example:

   UNIX:

```
export JAVA_HOME=repository_location/jdk
```

```
export PATH=$JAVA_HOME/bin:$PATH
```

This environment variable is not required while creating a response file. However, it is required for provisioning an environment. See Start the Wizard and Prepare to Install (page 13-5).

2. Verify that the `LIBPATH` value is null.
3. On UNIX systems, set the DISPLAY environment variable to an active and authorized display.
4. Run the following command on the primordial host. See Types of Hosts in a Multiple-Host Environment (page 1-14).

   UNIX:

   ```
   cd framework_location/provisioning/bin
   ```

   ```
   ./provisioningWizard.sh
   ```

   Solaris:

   ```
   cd framework_location/provisioning/bin
   ```

   ```
   bash provisioningWizard.sh
   ```

Example 27-1

```
provisioningWizard.sh -invPtrLoc /oracle/oraInst.loc
-ignoreSysPrereqs
```

27.2.3 Wizard Screens and Instructions

Table 27-2 (page 27-5) shows the steps necessary to create a response file using the Provisioning Wizard. For help with any of the screens, click **Help**.

If the correct values required are not entered, the error and warning messages are displayed at the bottom of the screen.

Table 27-2 Creating an Extended Provisioning Response File

Screen	Description and Action Required
Welcome	No action is required on this read-only screen. Click **Next** to continue.
Installation Options	Presents the list of valid installation actions that can be performed using the wizard. Select **Create a Response File for Extending an Existing Fusion Application Environment**. Click **Next** to continue.
Introspect an Existing Fusion Applications Environment	Introspects an existing Oracle Fusion Applications environment which can be extended. Ensure that all Admin servers are running before proceeding with the introspection. • **Existing Applications Base**: Specify the location for the existing *APPLICATIONS_BASE*. Click **Next** to continue.

Table 27-2 (Cont.) Creating an Extended Provisioning Response File

Screen	Description and Action Required
Additional Configurations	This screen displays the product offerings selected when the environment was originally provisioned. Select the required checkbox to start the previously provisioned offerings. **Note:** If a new offering is available for selection on this screen. **DO NOT** select the new offering on this screen because only the offerings that are already provisioned in the environment that is being extended **must** be selected. Click **Next** to continue.
Provisioning Configurations	This screen **only** displays the offerings that have not been selected when the environment was provisioned. To see the details of the provisioned environment, use the **Click here to view the configurations that are already provisioned and started** link available on the screen. To extend the existing Oracle Fusion Applications environment, select one or more offerings, either within a configuration, or from the list of standalone product offerings. Select individual product offerings within a configuration, without selecting all available offerings. When individual product offerings are specified, provisioning starts the Managed Servers *only for the offerings that have been selected*. However, because interdependent details have been specified for the entire configuration, additional functionality can be turned on later. The additional functionality are turned on by using the Oracle Fusion Applications Functional Setup Manager to start the other Managed Servers. Click **Details** in the message pane to see a breakdown of servers for each offering. After clicking **Next**, selections cannot be changed on this screen. To make changes, click **Cancel**, open a new wizard session, and create a new response file for extending the existing Oracle Fusion Applications environment. Click **Next** to continue.

Table 27-2 (Cont.) Creating an Extended Provisioning Response File

Screen	Description and Action Required
Response File Description	Enter information to describe this response file. This description is not associated in any way with the executable response file, or the summary file, that has been saved at the end of the response file creation process. • **Response File Name**: Specify a name to identify this response file. • **Response File Version**: Assign a version number to this response file. The version is intended for documentation only. • **Created By**: Defaults to the operating system user who invoked the wizard. Set when the response file is initially created and cannot be modified for the current response file. • **Created Date**: Defaults to the date that the response file was initially created and saved. Set when the response file was initially created and cannot be modified for the current response file. • **Response File Description**: Provide a description of this response file. Click **Next** to continue.
Installation Location	This screen displays the credentials for the Node Manager and the location of the various directories required for installation and configuration actions. Click **Next** to continue.
System Port Allocation	Read-only screen displaying the **Applications Base Port** and **Other Ports**: Node Manager. Click **Next** to continue.
Database Configuration	Read-only screen displaying the database parameters established when the Oracle Database was installed. Click **Next** to continue.
Schema Passwords	The database that is installed contains preloaded schemas required for runtime execution. This read-only screen displays the schema password details. Click **Next** to continue.
ODI Password Configuration	Read-only screen displaying the ODI supervisor password. The ODI Supervisor Password is the Supervisor Password that is entered on the **Custom Variables** page during execution of Oracle Fusion Applications RCU, under the Primary and Work Repository component. Click **Next** to continue.
Domain Topology Configuration	Read-only screen displaying the domain topology configuration option chosen while provisioning the environment. The types of possible topologies are: • **Basic Topology**: One host for all domains • **Medium Topology**: One host per domain • **Advanced Topology**: One host per application and middleware component Click **Next** to continue.

Table 27-2 (Cont.) Creating an Extended Provisioning Response File

Screen	Description and Action Required
Common Domain	If applicable, specify values for the new selected domain and its middleware dependencies. All hosts must use the same operating system and share a common mount point for network storage. The host specified for the Admin Server is the default for all servers. The values for the previously selected configuration cannot be changed. • **Host Name**: Specify the host where the Managed Servers for this domain is installed and configured. Note that this host cannot be the same Oracle Identity Management host. • **Port**: Port for internal communications only. The wizard assigns values based on values on the **System Port Allocation** screen. Port values can be edited. However, these values must be unique within the domain and fall within the range previously specified. For example, in a range of 7401 to 7800, a value of 8444 generates an error. • **UCM Intradoc Server Port**: Port where the Universal Content Management Server listens. • **InBound Refinery Server Port**: Used for calling top-level services. Click **Next** to continue.
Product Family Domains	Specify values for this domain and its middleware dependencies. All hosts must use the same operating system and share a common mount point for network storage. The host specified for the Admin Server is the default for all servers. The default host can be changed. • **Host Name**: Specify the host where the Managed Servers for this domain is installed and configured.. Note that this host cannot be the same Oracle Identity Management host. • **Port**: Port for internal communications only. The wizard assigns values based on values on the **System Port Allocation** screen. Port values can be edited. However, these values must be unique within the domain and fall within the range previously specified. For example, in a range of 7401 to 7800, a value of 8444 generates an error. Click **Next** to continue.
Web Tier Configuration	Read-only screen displaying the values selected during the provisioning of the environment. Click **Next** to continue.

Table 27-2 (Cont.) Creating an Extended Provisioning Response File

Screen	Description and Action Required
Virtual Hosts Configuration	If applicable, specify values for the new domain that is selected. The values for the previously selected configuration cannot be changed. Specify the configuration parameters for the domains to be installed on the virtual hosts that is selected on the **Web Tier Configuration** screen. **Note:** If the environment has a Load Balancer enabled, the fields on this page are editable and populated with default values that may not be valid for the environment. Review and overwrite the default values with the values applicable to the environment. Review the settings from the original provisioning summary file and enter those values. Click **Next** to continue.
Load Balancer Configuration	Read-only screen displaying the Load Balancer configuration details. Load balancing enables the distribution of a workload evenly across two or more hosts, network links, CPUs, hard drives, or other resources. Click **Next** to continue.
Web Proxy Configuration	Read-only screen displaying the Web Proxy configuration details. Click **Next** to continue.
IDM Properties File	Read-only screen displaying the IDM Properties file details. Click **Next** to continue.
Identity Management Configuration	Read-only screen displaying the Oracle Identity Management configuration details. Click **Next** to continue.
Access and Policy Management Configuration	Read-only screen displaying the Access and Policy Management configuration details to integrate the Oracle Fusion Applications environment with Oracle Identity Management. Click **Next** to continue.

Table 27-2 (Cont.) Creating an Extended Provisioning Response File

Screen	Description and Action Required
Summary	Verify that the installation represented on this screen is correct. Click **Back** to return to the interview screens that require changes. Complete the following information: • **Provisioning Response File Name**: Specify a unique file name for this response file. This is the executable file that is supplied to the wizard when prompted for other options. • **Provisioning Summary**: Specify a unique name for the summary details file. This file cannot be used to execute the response file. • **Directory**: Enter the directory path where this response file and the summary file are saved. Choose a location that is visible to all servers accessing shared storage. Make sure the location is not read-only. Record the name of the response file and its location. Supply it to the system administrator to use when performing system maintenance tasks. Click **Finish** to save the response file and the summary. The response file is complete and can be used as the basis for extending the exiting Oracle Fusion Applications environment. If the Oracle Fusion Applications environment is being upgraded, follow the steps in Update Status to Success (Incremental Provisioning) in the *Oracle Fusion Applications Upgrade Guide* to proceed with the upgrade.

27.3 Perform Incremental Provisioning

After the extended provisioning response file is created, perform incremental provisioning to extend the existing Oracle Fusion Applications environment. The incremental provisioning process is the same as provisioning a new Oracle Fusion Applications Environment as described in Provision a New Oracle Fusion Applications Environment (page 13-1), except that the provisioning phases are based on the extended provisioning response file.

In the extended provisioning response file previously created, the configuration details necessary to run a physical installation of Oracle Fusion Applications product offerings were specified. For full-scale environments, typically the offerings must be provisioned on multiple hosts, and the installation must be run from a shared drive that is accessible to all hosts.

Incremental provisioning goes through the same provisioning process to create a new Oracle Fusion Applications environment. The installation provisioning process is run in phases, in an assigned order. Complete each phase, in order, on each host, before moving to the next phase. All phases must be completed successfully on all the hosts in the environment to create a fully operational applications environment.

When the preverify phase is successful on the primordial host and the webtier host is placed in the DMZ, place a copy of the response file, the generated provisioning plan (*APPLICATIONS_BASE*`/provisioning/plan/provisioning.plan`), and a copy

of the introspect response file (`introspect.rsp`, located in *`APPLICATIONS_BASE`*`/provisioning/introspect/introspect.rsp` in the webtier host in the DMZ.

After incremental provisioning completes successfully, follow the steps in Update Status to Success (Incremental Provisioning) in the *Oracle Fusion Applications Upgrade Guide* to proceed with the upgrade.

27.4 Troubleshoot Incremental Provisioning

If an issue is encountered while performing incremental provisioning, follow the same guidelines and steps described in Troubleshoot an Oracle Fusion Applications Environment (page 14-1) to resolve the issues.

The following section describes troubleshooting for specific issues that might be encountered with incremental provisioning.

- If the environment does not already have any one of the Oracle Sales, Oracle Marketing, or Oracle Financials offerings, and to add at least one of them through incremental provisioning, then confirm that the true-type fonts are installed at `/usr/share/X11/fonts/TTF`. If the true-type fonts are missing, install them before proceeding to the next step.

27.4.1 Troubleshoot Response File Creation Errors

Problem

The creation of the extended provisioning response file fails with the following password validation error for Node Manager confirm password, BI RPD confirm password and OAM webgate confirm password:

```
Confirm Password: The password must contain only alphanumeric and
punctuation characters. Trailing or leading whitespace characters are
not allowed.
```

Solution

Manually update the `introspect.rsp` file to reflect correct confirm passwords:

1. Run the wizard and proceed until the introspection page
2. Click next to complete introspection
3. Close the wizard at the **Additional Configurations** screen
4. Update the $PROVTMP/introspect.rsp (Default /tmp/introspect.rsp) file for these properties. Copy the value of *PWD and paste to *PWDCONFIRM:

```
INSTALL_NODEMNGR_PWD=<copy_this_value>
INSTALL_NODEMNGR_PWDCONFIRM=<paste_the_value_from
INSTALL_NODEMNGR_PWD>

INSTALL_BIRPD_PWD=<copy_this_value>
INSTALL_BIRPD_PWDCONFIRM=<paste_the_value_from INSTALL_BIRPD_PWD>

OAM_WEBGATE_PWD=<copy_this_value>
OAM_WEBGATE_PWDCONFIRM=<paste_the_value_from OAM_WEBGATE_PWD>
```

> **Note:**
>
> For Linux, the default location for the `introspect.rsp` file is `/tmp/introspect.rsp`. For Solaris, the default location for the `introspect.rsp` file is `/var/tmp`.

5. Set the env variable:

   ```
   export SKIP_INTROSPECTION=true
   ```

6. Rerun the wizard and go through all the pages to create the response file.

27.4.2 Troubleshoot Preverify Phase Errors

The following section describes the steps to troubleshoot preverify phase errors.

- If the webtier host is located in DMZ, then invoke the preverify phase on the webtier host with the `-ignoreSyspreqs` argument.

27.4.3 Troubleshoot Install Phase Errors

The following section describes the steps to troubleshoot install phase errors.

27.4.3.1 Install Phase Errors Caused by Configuration Changes Done by Other Privileged Users

Do not make configuration changes to the Oracle Fusion Applications environments using super user (root) or other privileged users. Such changes alter file permissions, causing issues that are hard to troubleshoot and result in severe errors as shown in the following example.

Example

The install phase of performing incremental provisioning fails with the following error message in the provisioning log file:

```
[2014-10-09T10:33:01.762+00:00] [runProvisioning-install] [NOTIFICATION]
[FAPROV-01214] [runProvisioning-install] [tid: 10]
[ecid: 0000KZoTsKmDĝ95RfL6id1KDaGu000001,0] [arg: /u02/instance] [arg: /u01/
APPLTOP/instance/provisioning/restart/backup_install/instance.tar]
Compressing /u02/instance to backup /u01/APPLTOP/instance/provisioning/restart/
backup_install/instance.tar

[2014-10-09T10:33:02.771+00:00] [runProvisioning-install] [WARNING] []
[runProvisioning-install] [tid: 12]
[ecid: 0000KZoU18nDĝ95RfL6id1KDaGu000004,0]
[exec] /bin/tar: /CommonDomain_webtier_local/config/OHS/ohs1/webgate/config/
oblog_config_wg.xml.09222014:
Cannot open: Permission denied

[2014-10-09T10:33:16.858+00:00] [runProvisioning-install] [WARNING] []
[runProvisioning-install] [tid: 12]
[ecid: 0000KZoU18nDĝ95RfL6id1KDaGu000004,0] [exec] /bin/tar: Error exit
delayed from previous errors

[2014-10-09T10:33:16.868+00:00] [runProvisioning-install] [NOTIFICATION] []
```

```
[runProvisioning-install] [tid: 10]
[ecid: 0000KZoTsKmDĝ95RfL6id1KDaGu000001,0] [delete] Deleting: /u01/APPLTOP/
instance/provisioning/restart/backup_install/instance.tar

[2014-10-09T10:33:16.906+00:00] [runProvisioning-install] [NOTIFICATION]
[FAPROV-01214] [runProvisioning-install]
[tid: 10] [ecid: 0000KZoTsKmDĝ95RfL6id1KDaGu000001,0] [arg: /u02/instance]
[arg: /u01/APPLTOP/instance/provisioning/restart/backup_install/instance.tar]
Compressing /u02/instance to backup /u01/APPLTOP/instance/provisioning/restart/
backup_install/instance.tar

[2014-10-09T10:33:17.028+00:00] [runProvisioning-install] [WARNING] []
[runProvisioning-install] [tid: 13]
[ecid: 0000KZoU4b^Dĝ95RfL6id1KDaGu000005,0]
[exec] /bin/tar: ./CommonDomain_webtier_local/config/OHS/ohs1/webgate/config/
oblog_config_wg.xml.09222014:
Cannot open: Permission denied

[2014-10-09T10:33:18.422+00:00] [runProvisioning-install] [WARNING] []
[runProvisioning-install] [tid: 13]
[ecid: 0000KZoU4b^Dĝ95RfL6id1KDaGu000005,0] [exec] /bin/tar: Error exit
delayed from previous errors
```

These errors are caused by the OHS configuration being changed by a user other than the user that provisioned the Oracle Fusion Applications environment prior to performing incremental provisioning. In this case the file, *APPLICATIONS_CONFIG*/OHS/ohs1/webgate/config/oblog_config_wg.xml.09222014, was altered and is now owned by the root user.

Resolution

Perform the following steps to resolve this issue.

1. Change the ownership of the file in question, to the user who created the Oracle Fusion Applications environment.
2. Follow the steps in Recovery After Failure (page 14-4).
3. Rerun the install phase of incremental provisioning.

27.5 Next Steps

After successfully extending the Oracle Fusion Applications environment, resume the Upgrade Orchestrator process to complete the upgrade. For more information about the upgrade process, see Update Status to Success (Incremental Provisioning) in the *Oracle Fusion Applications Upgrade Guide* to proceed with the upgrade.

DO NOT start using the environment unless the upgrade process is successfully completed.

To scale out the Oracle Fusion Applications environment to make it high availability, follow the required steps after completing the upgrade. For more information about scaling out, see Complete Conditional Common High Availability Post-Installation Tasks for Oracle Fusion Applications (page 18-1).

28

Uninstall an Oracle Fusion Applications Environment

This section describes the actions necessary to remove an existing Oracle Fusion Applications environment from a system. It includes step-by-step instructions and provides important information about the ramifications of taking this action.
This section includes the following topics:

- Introduction to Uninstall an Oracle Fusion Applications Environment (page 28-1)
- Prerequisites to Uninstall an Oracle Fusion Applications Environment (page 28-2)
- Uninstall Oracle Fusion Applications Using the Provisioning Wizard (page 28-2)
- Uninstall Oracle Fusion Applications From the Command Line (page 28-5)
- Clean Up After Uninstalling Oracle Fusion Applications (page 28-5)
- Uninstall Oracle Identity Management (page 28-6)
- Delete the Database (page 28-6)
- Uninstall the Oracle Identity Management Provisioning Framework (page 28-6)
- Uninstall the Oracle Fusion Applications Provisioning Framework (page 28-7)

28.1 Introduction to Uninstall an Oracle Fusion Applications Environment

During the uninstallation process, components that were installed using the Provisioning Wizard are removed. The Oracle Fusion Applications database and the Oracle Identity Management components are not removed. To remove the Oracle Fusion Applications database, see Delete the Database (page 28-6). The Oracle Identity Management environment, including the Oracle Identity Management databases is not removed.

Note the following characteristics of the uninstallation process:

- Run the `deinstall` process on *all* hosts. Use the Provisioning Wizard `deinstall` option for the Primordial host, and the command line option for the Primary host and Secondary host. Products installed from the command line must be uninstalled from the command line.
- Start the Provisioning Wizard on the same host (primordial) where it was started at the time of installation. Monitor the process on all hosts using the primordial host interface.
- All binaries, regardless of patch level, are removed.

It is not possible to partially uninstall an environment by selecting specific components to uninstall.

28.2 Prerequisites to Uninstall an Oracle Fusion Applications Environment

Always use the provisioning `deinstall` option (the Provisioning Wizard option or the command line) rather than simply deleting the *`APPLICATIONS_BASE`*, *`APPLICATIONS_CONFIG`*, and the `oraInventory` directories manually. This is especially important for the web tier. Two of its instances share the same `oraInventory` location.

Before beginning the uninstallation process, complete these tasks:

1. Stop any processes that are running in the environment.
2. Shut down all Managed Servers, the Administration Server, and the Node Manager on all hosts. See Stop the Entire Environment in Order in the *Oracle Fusion Applications Administrator's Guide*.
3. Stop Oracle HTTP Server with this command: *`APPLICATIONS_CONFIG/CommonDomain_webtier`*`/bin/opmnctl shutdown`.
4. Stop the Oracle Business Intelligence components that are controlled by Oracle Process Manager and Notification Server with this command: *`APPLICATIONS_CONFIG/BIInstance`*`/bin/opmnctl shutdown`.
5. Shut down Global Order Promising (GOP) (if provisioned):

   UNIX: *`APPLICATIONS_CONFIG/gop_1`*`/bin/opmnctl shutdown`.
6. Stop the Java EE components using Oracle Enterprise Manager Fusion Middleware Control. See Starting and Stopping Java EE Applications Using WLST in the *Oracle Fusion Middleware Administering Oracle Fusion Middleware*.

See Start and Stop Components in the *Oracle Fusion Applications Administrator's Guide*.

28.3 Uninstall Oracle Fusion Applications Using the Provisioning Wizard

To perform an uninstallation using the Provisioning Wizard, start the wizard from the primordial host and complete the uninstallation interview screens.

28.3.1 Start the Provisioning Wizard

To start the Provisioning Wizard, do the following from the primordial host:

1. Set the *`JAVA_HOME`* environment variable to point to the JDK location in the provisioning repository, for example:

   UNIX:

   `export` *`JAVA_HOME=REPOSITORY_LOCATION`*`/jdk`

   `export PATH=$JAVA_HOME/bin:$PATH`
2. Verify that the LIBPATH value is null.
3. Run the following command on the primordial host:

UNIX:

```
cd FAPROV_HOME/provisioning/bin
./provisioningWizard.sh
```

Solaris: use `bash provisioningWizard.sh` instead of `./provisioningWizard.sh`.

28.3.2 Wizard Interview Screens and Instructions

Table 28-1 (page 28-3) shows the steps necessary to uninstall an Oracle Fusion Applications environment with the Provisioning Wizard. For help with any of the interview screens, click **Help**.

If the correct values required are not entered, error and warning messages are displayed at the bottom of the screen.

Table 28-1 Deinstalling an Oracle Fusion Applications Applications Environment

Screen	Description and Action Required
Welcome	No action is required on this read-only screen. Click **Next** to continue.

Table 28-1 (Cont.) Deinstalling an Oracle Fusion Applications Applications Environment

Screen	Description and Action Required
Specify Central Inventory Location	This screen displays only if one or more of the following conditions are not met: • The `-invPtrLoc` option is used to specify the central inventory location. Thus, default value for the platform is not used. Note that the default value for Linux platforms is `/etc/oraInst.loc`. For Solaris, the default value is `/var/opt/oracle/oraInst.loc`. • The Central Inventory Pointer File is readable. • The Central Inventory Pointer File contains a value for `inventory_loc`. • The `inventory_loc` directory is writable. • The `inventory_loc` directory has at least 150K of space. • `inventory_loc` is not an existing file. Specify the location of the **Central Inventory Directory** that meets the previous criteria. The `inventory_loc` directory can be created by the `createCentralInventory.sh` script and does not have to exist at the time its location is specified. For non-Windows platforms, in the **Operating System Group ID** field, select or enter the group whose members are granted access to the inventory directory. All members of this group can install products on this host. Click **OK** to continue. The **Inventory Location Confirmation** dialog prompts to run the *`inventory_directory`*`/createCentralInventory.sh` script as root, to confirm that all conditions are met and to create the default inventory location file, such as `/etc/oraInst.loc`. After this script runs successfully, return to the interview and click **OK** to proceed with the installation. To continue the installation without root access, select **Continue installation with local inventory**. Click **OK** to proceed with the installation. For more information about inventory location files, see Oracle Universal Installer Inventory in the *Oracle Universal Installer User's Guide*. Click **Next** to continue.
Installation Options	Presents a list of valid installation actions that can be performed using the Provisioning Wizard. Select **Deinstall an Applications Environment**. Enter the directory path in the **Response File** field to the response file associated with the environment that needs to be deinstalled. Or click **Browse** to navigate to the response file location. Click **Next** to continue.
Summary	Displays the application and middleware components to be uninstalled. The processes associated with these components must be shut down manually. See Prerequisites to Uninstall an Oracle Fusion Applications Environment (page 28-2). Click **Deinstall** to begin uninstalling the applications and middleware components.

Table 28-1 (Cont.) Deinstalling an Oracle Fusion Applications Applications Environment

Screen	Description and Action Required
Deinstallation Progress	The uninstallation process runs on the primordial host. Uninstall from the command line on any primary or secondary hosts provisioned in the environment. See Uninstall Oracle Fusion Applications From the Command Line (page 28-5). The following symbols help track the deinstall progress: • **Block**: Processing has not yet started on this host for the named phase. • **Clock**: Performing the build for a phase. • **Check mark**: The build was completed successfully. • **x** mark: The build has failed for this phase. Correct the errors before continuing. • **Restricted** symbol: The validation process has stopped due to a failure within another process. Click an **x** or a **Restricted** symbol to display information about failures. Click the host-level **Log** file for details about this phase. Click a build **Log** file to see details specific to that build. If the uninstallation fails, a **Retry** button is enabled, allowing to try the uninstall again. See Recovery After Failure (page 14-4) for information about retry, cleanup, and restore actions. Click **Next** to continue.
Deinstallation Complete	Review the list of components removed from this environment. Click **Save** to create a text file that contains the details. See Clean Up After Uninstalling Oracle Fusion Applications (page 28-5) for information about manual tasks necessary to complete the uninstallation process. Click **Finish** to dismiss the screen.

28.4 Uninstall Oracle Fusion Applications From the Command Line

If a primary or secondary host have been provisioned, run the `deinstall` command on those hosts from the command line, using the same procedure used during provisioning. If the primordial host is no longer available, the entire uninstall process must be run from the command line.

Run the `deinstall` command as `root` (with administration privileges) as follows:

UNIX: `runProvisioning.sh -responseFile` *`response_file_location`* `-target deinstall`

If the web tier has been deployed in a DMZ, run the Oracle Universal Installer (OUI) manually on that host to uninstall. See Introduction to Oracle Universal Installer (OUI) in the *Oracle Universal Installer User's Guide*.

28.5 Clean Up After Uninstalling Oracle Fusion Applications

The remaining cleanup tasks are as follows:

UNIX:

1. If processes are set up to run as a service, verify the */etc/services* file and remove the corresponding entries from the file.
2. If processes are set up to run as a service, verify the */etc/inetd.conf* file and remove the corresponding process entries from the file.
3. Clean up or remove the *APPLICATIONS_BASE* directory.
4. Clean up or remove the application configuration (*APPLICATIONS_CONFIG*) directory. If local application configuration is enabled, clean up or remove also the local application configuration directories.

Deinstalling Oracle Fusion Applications does not remove the `beahomelist` file or the `bea` directory under:

UNIX: `user_home/bea/beahomelist`

For information about how this file is used, see Backup Artifacts and Updating Oracle Inventory in the *Oracle Fusion Middleware Administrator's Guide*.

28.6 Uninstall Oracle Identity Management

Follow these instructions to clean up an Oracle Identity Management provisioned environment, before starting another round of provisioning.

Linux or UNIX:

1. On each host, kill all Oracle Identity Management processes. Restarting the host is recommended.
2. On each host, delete the contents of the directory `IDM_LOCAL_CONFIG`.
3. Delete the contents of the directories `IDM_BASE` and `IDM_CONFIG` on shared storage.
4. Drop the database schema using Oracle Fusion Middleware Repository Creation Utility. When dropping the schema, ensure to select the ODS schema, as it is not selected by default. Oracle Identity Management Provisioning faisl during the next run if this step is not performed correctly.
5. Rerun provisioning.

28.7 Delete the Database

To delete the database, use Database Configuration Assistant (DBCA) to delete an instance of the database and then remove the database software. See Deleting a Database Using DBCA and Removing Oracle Database Software in *Oracle Database 2 Day DBA*.

28.8 Uninstall the Oracle Identity Management Provisioning Framework

Follow the instructions described in this section to uninstall the Oracle Identity Management provisioning framework.

1. Stop all services running under *IDMLCM_HOME*. Since there is no script for killing processes under *IDMLCM_HOME*, kill all the processes running under *IDMLCM_HOME* manually.
2. Change directory to *IDMLCM_HOME*`/oui/bin` and execute the following command:

   UNIX:

   ```
   runInstaller -deinstall -jreLoc <JAVA_HOME>
   ```

3. On the Oracle Universal Installer screen, proceed as follow in Table 28-2 (page 28-7):

Table 28-2 Provisioning Framework Deinstallation Screen Flow

Screen	Description and Action Required
Welcome	No action is required on the read-only screen. Click **Next** to continue.

Deinstall Oracle Home	Verify that the directory path is correct. Click **Save** to create a text file with the details of the configuration that is being deinstalled.
	Click **Deinstall** to continue. On the **Warning** screen, click **Yes** to remove the software files and the provisioning Oracle home directory. Click **No** to remove only the software files, or **Cancel** to return to the previous screen.
	If **No** is clicked, remove the files manually. For example, if the provisioning framework directory is `/d1/Oracle/Provisioning`, use this syntax:
	(UNIX)
	`cd /d1/oracle/provisioning`
	`rm -rf provisioning`

Deinstallation Progress	The progress of the deinstallation is monitored. Click **Cancel** to stop the process. Click **Next** to continue.
Deinstallation Complete	Review the summary of the deinstallation and the components that were deinstalled. Click **Finish** to exit.

If the `JAVA_HOME` environment variable is not set, retrieve it from *REPOSITORY_LOCATION/installers/jdk/jdk.zip*, unzip it to any location and set the `JAVA_HOME`.

28.9 Uninstall the Oracle Fusion Applications Provisioning Framework

Uninstalling Oracle Fusion Applications involves removing the Oracle Fusion Applications Provisioning Oracle home. The deinstaller attempts to remove the Oracle home from which it was started, and removes only the software in the Oracle home.

Before removing the Oracle Fusion Applications Provisioning Oracle home, ensure that it is not in use. After removing the software, provisioning a new Oracle Fusion Applications environment is not longer possible.

28.9.1 Run the Provisioning Framework Deinstaller

To start the deinstaller, navigate to:

UNIX: *FAPROV_HOME*/oui/bin and use this command:

```
runInstaller -deinstall -jreLoc REPOSITORY_LOCATION/jdk
```

The **Uninstall** menu is a Windows shortcut to the `setup.exe -deinstall` command. Do not use the `Start -> All Programs -> Oracle - OHnnnn -> Oracle Installation Products -> Uninstall` menu option on Windows operating systems, where nnnn is a number. This **Uninstall** menu is also a shortcut to the `setup.exe` program but does not have the `-deinstall` command line option. Therefore, it is not deinstall the provisioning framework.

The deinstaller described in this section removes the provisioning framework to provision the Oracle Fusion Applications environment. It does not uninstall the Oracle Fusion Applications environment. To uninstall an Oracle Fusion Applications environment, refer to Uninstall Oracle Fusion Applications Using the Provisioning Wizard (page 28-2) or Uninstall Oracle Fusion Applications From the Command Line (page 28-5) before removing the provisioning wizard from the system.

28.9.2 Deinstaller Screens and Instructions

Table 28-3 (page 28-8) contains instructions for uninstalling the provisioning framework. For help with any of the interview screens, click **Help**.

Table 28-3 Provisioning Deinstaller Screen Flow

Screen	Description and Action Required
Welcome	No action is required on this read-only screen. Click **Next** to continue.
Deinstall Oracle Home	Verify that the directory path is correct. Click **Save** to create a text file with the details of the configuration to be deinstalled. Click **Deinstall** to continue. On the **Warning** screen, select whether the deinstaller should remove the Oracle home directory in addition to removing the software. Click **Yes** to remove the software files and the provisioning Oracle home directory. Click **No** to remove only the software files, or click **Cancel** to return to the previous screen. If **No** is clicked, remove the framework software files manually. For example, use this syntax if the directory is `/d1/oracle/provisioning`: UNIX: `cd /d1/oracle/provisioning` `rm -rf provisioning`
Deinstallation Progress	Monitor the progress of the deinstallation. Click **Cancel** to stop the process. Click **Next** to continue.
Deinstallation Complete	Click **Finish**.

Glossary

applications base

The top-level directory for the Oracle Fusion Applications binaries. You specify a name for this directory at the time of provisioning. This directory includes two mount points: `/net/mount1/appbase` for components that will remain read-only after provisioning, and `/net/mount2` (`APPLICATIONS_CONFIG`) to contain instances that are configurable after provisioning. This structure aids performance issues and accommodates a "lock-down" of binaries after provisioning. It ensures that the configurable components remain available.

BPEL

Business Process Execution Language; a standard language for defining how to send XML messages to remote services, manipulate XML data structures, receive XML messages asynchronously from remote services, manage events and exceptions, define parallel sequences of execution, and undo parts of processes when exceptions occur.

cleanup

The installation phase that shuts down processes started during a failed phase and performs the necessary cleanup actions. If the automated cleanup fails, you must manually stop all processes except the Node Manager on all hosts including OPMN and Java EE processes before you can run the restore action. Note, however, that you must stop *all* processes if you are running the cleanup action on the Configure phase

CLI

Used for starting the Provisioning Wizard and running installation phases on the Primary host, Secondary host, and DMZ host (when present).

cluster

A group of Oracle WebLogic Servers that work together to provide scalability and high availability for applications. A cluster appears as a single Oracle WebLogic Server instance. The Managed Server instances that constitute a cluster can run on the same

host or be located on different hosts. Applications are deployed to the cluster, which implies deployment to every Managed Server within the cluster.

Configure

The installation phase that creates domains, Managed Servers, and clusters. Configures data sources and performs Node Manager registration of servers on the primordial host and primary host.

Configure-secondary

The installation phase that performs the configuration actions on a primary or secondary host (or both), registers Managed Servers with the Node Manager on secondary hosts, and creates a web tier instance. If there are no primary or secondary hosts, or if there are only primary hosts, this phase runs, but takes no action.

cube

A block of data that contains three or more dimensions. An Essbase database is a cube.

DMZ

Acronym for demilitarized zone. An isolated internal network used for servers that are accessed by external clients on the Internet, such as web servers, to provide a measure of security for internal networks behind the firewall.

DMZ host

A host that cannot access the shared storage within the firewall. This type of host is typically used to install the Oracle HTTP Server so that restrictions on communication with components within the firewall can be enforced.

e-mail bounce

An e-mail that is returned due to a temporary or permanent error condition.

financial reporting book

Comprised of reports and other documents such as text, PDF, PowerPoint, Excel and Word files. When run, the report data is dynamically retrieved from the database; the snapshot data remains static.

FTP

Acronym for File Transfer Protocol. A system for transferring computer files, generally by the Internet.

global area

The region across the top of the user interface. It provides access to features and tools that are relevant to any page you are on.

home directory

A directory that contains one or more Oracle Fusion Middleware homes or Oracle Fusion Applications homes. This directory has no functional significance other than as a grouping of related Oracle product offerings.

idmsetup.properties

A properties file, `idmsetup.properties`, is automatically generated during the provisioning of an Oracle Identity Management environment. This file includes some of the configuration values that you must supply to the Provisioning Wizard when you create a response file. These values must be included in your response file to integrate Oracle Identity Management components with an Oracle Fusion Applications environment.

Select the **Load IDM Configuration from IDM Properties file** option available on the **IDM Properties File** screen of the Provisioning Wizard, if you want the values on the Identity Management Configuration screen and the Access and Policy Management Configuration screen to default to the values in the IDM properties file. You must however review these screens to ensure that all values are accurate before proceeding to the next screen.

The properties file is created in:*`SHARED_CONFIG_DIR`*`/fa/idmsetup.properties`, where `SHARED_CONFIG_DIR` is the shared configuration location that you selected in the **Install Location Configuration** page of the Oracle Identity Management Provisioning Wizard.

For more information about the IDM properties file, see Passing Configuration Properties File to Oracle Fusion Applications (page 10-23).

Install

The installation phase that installs middleware and applications components and applies database patches shipped with provisioning (for databases created with the wizard).

Managed Server

A server which hosts components and associated resources that constitute each product configuration. The domains are predefined to ensure that product offerings and their dependencies are always stored in a standardized arrangement.

MTA

Acronym for mail transfer agent. A software program that transfers electronic mail messages from one computer to another.

offering

A comprehensive grouping of business functions, such as Sales or Product Management, that is delivered as a unit to support one or more business processes.

Oracle Fusion Applications Search

A special type of search based on technology that differs from that of most other searches in Oracle Fusion Applications. Oracle Fusion Applications Search is available in the global area and other places.

point of view

User selected dimensions that are not included in the grids at the row, column or page levels for a particular report. Only these dimensions can be overridden at run time, unless user also specifically defined Prompt for the dimensions on the grid.

Postconfigure

Installation phase which configures Oracle SOA Suite composite deployment and Oracle HTTP Server, and populates policies and grants. Configures middleware and applications that require servers to be online.

Preconfigure

The installation phase that updates the Oracle Application Development Framework (Oracle ADF) configuration.

Preverify

The installation phase that checks to see that the prerequisites for an installation are met.

Primary host

The host on which the Administration Server of a domain runs.

Primordial host

The host that contains the Common domain (and specifically the Administration Server of the Common domain). There is one, and only one, primordial host per shared drive.

product offerings

Groups of features within an installation of Oracle Fusion Applications which represent the highest-level collection of functionality that you can license and implement.

provisioning configuration

A collection of one or more product offerings.

Provisioning Command-line Interface (CLI)

See CLI.

provisioning repository

A repository which contains all the installers required to provision a new Oracle Fusion Applications environment. You download the repository from the Oracle Fusion Applications Product Media Package and extract the files to a location of your choice, for example *repository_location*/installers. The repository must be located on a networked drive or a shared hard disk so that it is accessible to all the hosts in your new environment.

provisioning summary file

A file which contains details that describe the installation. It is automatically created by provisioning after the installation is complete and includes a link to the Oracle Fusion Applications home page.

Provisioning Wizard

A question-and-answer interview that guides you through the process of installing a database, creating or updating a response file, and installing or deinstalling the components of an Oracle Fusion Applications environment.

response file

A collection of configuration details you specify about installation locations, product offerings and middleware (technology stack) dependencies. In addition, you enter connection parameters for the database and identity management components that you set up as prerequisites. You use the Provisioning Wizard interview to create and execute the response file.

restore

The installation phase consisting of the necessary restore actions required for a given provisioning phase. This action deletes and restores the instance directory, and, if necessary (and available), restarts the Common Domain Administration Server and Oracle HTTP Server.

Secondary host

Location where the Managed Servers for any application reside when they are not on the same host as the Administration Server of the same domain. Typically used when a domain spans two physical servers.

SOA

Abbreviation for service-oriented architecture.

Startup

Installation phase that starts the Administration Server and the Managed Server on the current host. Performs online configuration, including global unique identifier (GUID) reconciliation and Financial/IPM configuration.

Validate

Installation phase that validates the deployment configuration and starts the Managed Server.

WebLogic Server Domain

A logically related group of Oracle WebLogic Server resources that is managed as a unit. It consists of an Administration Server and one or more Managed Server.

WSDL

Abbreviation for Web Services Description Language. It is an XML format that provides a model for describing Web services.

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