

Oracle® Application Server

Enterprise Deployment Guide

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Preface

This preface describes the audience, contents and conventions used in the *Oracle Application Server Enterprise Deployment Guide*.

Intended Audience

This guide is intended for system administrators who are responsible for installing and configuring Oracle Application Server.

Documentation Accessibility

Our goal is to make Oracle products, services, and supporting documentation accessible, with good usability, to the disabled community. To that end, our documentation includes features that make information available to users of assistive technology. This documentation is available in HTML format, and contains markup to facilitate access by the disabled community. Accessibility standards will continue to evolve over time, and Oracle is actively engaged with other market-leading technology vendors to address technical obstacles so that our documentation can be accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

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Related Documents

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

- *Oracle Application Server Installation Guide*
- *Oracle Internet Directory Administrator's Guide*
- *Oracle Application Server Single Sign-On Administrator's Guide*
- *Oracle Application Server Concepts*
- *Oracle Application Server Administrator's 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.
<i>italic</i>	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.
/	A forward slash is used as a directory separator in paths, regardless of platform.

This chapter introduces Enterprise Deployment concepts, and summarizes the benefits provided by the Oracle Application Server Enterprise Deployment configurations described in other chapters of this guide. It contains the following topics:

[Section 1.1, "What is an Enterprise Deployment?"](#) on page 1-1

[Section 1.2, "Benefits of the Oracle Application Server Enterprise Deployment Configurations"](#) on page 1-2

1.1 What is an Enterprise Deployment?

An enterprise deployment is one of the Oracle Application Server configurations described in this guide, designed to support large-scale, mission-critical business software applications. The hardware and software in an Enterprise Deployment configuration delivers:

High quality service

- The system workload is managed and balanced effectively
- Applications continue to operate when resources are added or removed
- System maintenance and unexpected failures cause zero downtime

Built-in Security

- All incoming network traffic is received by the load balancing router on a single, secure port and directed to internal IP addresses within the firewall; inside the firewall, functional components are grouped within DMZs
- User accounts are provisioned and managed centrally
- Security systems are integrated
- Administrative access is isolated

Efficient software provisioning and management

- Application distribution is simple
- Systems are managed and monitored as one logical unit in a central console
- Death detection and restart mechanisms ensure availability

1.2 Benefits of the Oracle Application Server Enterprise Deployment Configurations

The Oracle Application Server configurations discussed in this guide are designed to ensure security of all transactions, maximize hardware resources, and provide a reliable, standards-compliant system for enterprise computing with a variety of applications. This section describes the security and high availability benefits of the Oracle Application Server configurations and how they are achieved.

1.2.1 Built-in Security

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

- All external communication received on port 80 is redirected to port 443.
- Communication from external clients does not go beyond the Load Balancing Router level.
- No direct communication from the Load Balancing Router to the Data tier DMZ is allowed.
- Components are separated between DMZs on the Web Tier, Application Tier, and the Data Tier.
- Direct communication between two firewalls at any one time is prohibited.
- If a communication begins in one firewall zone, it must end in the next firewall zone.
- Oracle Internet Directory is isolated in the Data tier DMZ.
- Identity Management components are in the DMZ.
- All communication between components across DMZs is restricted by port and protocol, according to firewall rules.

1.2.2 High Availability

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

Selecting a Deployment Architecture

This chapter introduces Oracle Application Server installation types and architectures and the nomenclature used in this guide to describe the Enterprise Deployment architectures. It contains the following topics:

[Section 2.1, "Creating Solutions with Oracle Application Server"](#) on page 2-1

[Section 2.2, "Enterprise Deployment Nomenclature"](#) on page 2-1

[Section 2.3, "Understanding the Enterprise Deployment Architecture"](#) on page 2-2

[Section 2.4, "What's New in myJ2EE"](#) on page 2-5

[Section 2.5, "Understanding Deployment Variants"](#) on page 2-6

[Section 2.6, "How to Use this Guide: The Enterprise Deployment Configuration Process"](#) on page 2-9

2.1 Creating Solutions with Oracle Application Server

Oracle Application Server 10g Release 3 (10.1.3) is a complete, fully integrated product that delivers a wide range of solutions to business and technology challenges. This guide presents a subset of these, in the form of recommendations based on deployments by Oracle customers.

This guide provides installation and configuration steps for the J2EE Server and Process Management installation type, using Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider/LDAP authentication.

For complete descriptions of the components comprising these installation types and selections, see the *Oracle Application Server Concepts* guide.

2.2 Enterprise Deployment Nomenclature

The naming convention for the components and computers is established in the architecture diagram on [page 2-4](#) and is used throughout this guide. Server names and their related URLs and IP addresses are provided in [Table 2-1](#). The external load balancer nomenclature is provided in [Table 2-2](#).

Table 2–1 Server Name, URL and IP Address Reference

Description	Name	URL	IP Address
Servers with 2-node Real Application Clusters database for Security Metadata Repository	INFRADBHOST1	infradbhost1.mycompany.com	xxx.xxx.xxx.225
	INFRADBHOST2	infradbhost2.mycompany.com	xxx.xxx.xxx.226
Oracle Internet Directory servers	OIDHOST1	oidhost1.mycompany.com	xxx.xxx.xxx.229
	OIDHOST2	oidhost2.mycompany.com	xxx.xxx.xxx.230
Application middle tier servers	APPHOST1	apphost1.mycompany.com	xxx.xxx.xxx.233
	APPHOST2	apphost2.mycompany.com	xxx.xxx.xxx.234
Web tier servers (myJ2EECompany)	WEBHOST1	webhost1.mycompany.com	xxx.xxx.xxx.235
	WEBHOST2	webhost2.mycompany.com	xxx.xxx.xxx.236

Table 2–2 External Load Balancer Name, URL and IP Address Reference

Description	URL	IP Address
Virtual IP Address (myJ2EECompany)	myapp.mycompany.com:443	xxx.yyy.zzz.220
Internal Load Balancer for LDAP traffic	oid.mycompany.com:389/636	xxx.yyy.zzz.12
Failover Virtual IP Addresses (VIPs)	oid.mycompany.com:389/636	xxx.yyy.zzz.13

2.3 Understanding the Enterprise Deployment Architecture

This section briefly describes the Enterprise Deployment architecture in this guide, including minimum hardware requirements and a diagram of the architecture.

2.3.1 myJ2EE

Figure 2–1 shows the enterprise deployment architecture for J2EE applications that use the Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider for user authentication.

The servers in the myJ2EECompany system are grouped into tiers as follows:

- **Web Tier** — WEBHOST1 and WEBHOST2, with Oracle HTTP Server installed.
- **Application Tier** — APPHOST1 and APPHOST2, with Oracle Containers for J2EE installed, and multiple OC4J instances with applications deployed.
- **Data Tier** — OIDHOST1 and OIDHOST2, with 10g Release 2 (10.1.2) Oracle Internet Directory installed, and INFRADBHOST1 and INFRADBHOST2, the two-node Real Application Clusters database.

Table 2–3, Table 2–4 and Table 2–5 identify the basic, minimum hardware requirements for the servers in the myJ2EE architecture on Windows, Linux and Solaris operating systems, respectively. The memory figures represent the memory required to install and run Oracle Application Server; however, for most production sites, you should configure at least 1 GB of physical memory.

For detailed requirements, or for requirements for a platform other than these, see the *Oracle Application Server Installation Guide* for the platform you are using.

Table 2–3 myJ2EECompany Hardware Requirements (Windows)

Server	Processor	Disk	Memory	TMP Directory	Swap
WEBHOST and APPHOST	300 MHz or higher Intel Pentium processor recommended	400 MB	512 MB	55 MB to run the installer; 256 MB needed for some installation types	512 MB
OIDHOST and INFRADBHOST	300 MHz or higher Intel Pentium processor recommended	2.5 GB	1 GB	55 MB to run the installer; 256 MB needed for some installation types	1 GB

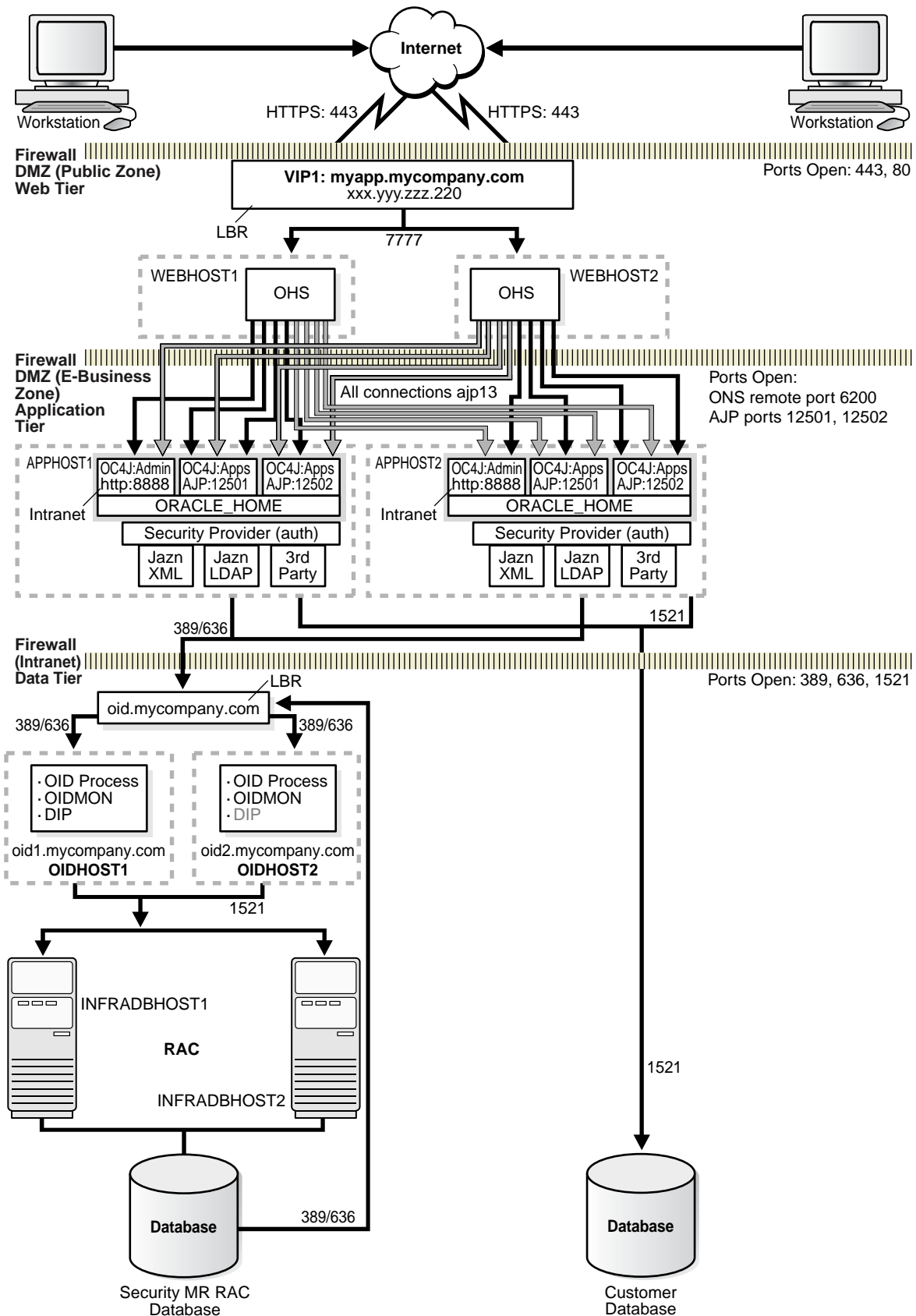
Table 2–4 myJ2EECompany Hardware Requirements (Linux)

Server	Processor	Disk	Memory	TMP Directory	Swap
WEBHOST and APPHOST	Pentium (32-bit), 450 MHz or greater	520 MB	512 MB	400 MB	1.5 GB
OIDHOST and INFRADBHOST	Pentium (32-bit), 450 MHz or greater	2.5 GB	1 GB	400 MB	1.5 GB

Table 2–5 myJ2EECompany Hardware Requirements (Solaris)

Server	Processor	Disk	Memory	TMP Directory	Swap
WEBHOST and APPHOST	450 MHz or greater; Oracle recommends a multiple CPU computer	750 MB	512 MB	250 MB	1.5 GB
OIDHOST	450 MHz or greater; Oracle recommends a multiple CPU computer	1.54 GB	1 GB	250 MB	1.5 GB
INFRADBHOST	450 MHz or greater; Oracle recommends a multiple CPU computer	3.93 GB	1 GB	250 MB	1.5 GB

Figure 2-1 Enterprise Deployment Architecture for myJ2EEcompany.com



2.4 What's New in myJ2EE

The myJ2EE Enterprise Deployment Architecture functions as it did in prior releases, but clustering, request routing, and authentication and authorization have changed in Oracle Application Server 10g Release 3 (10.1.3). [Table 2–6](#) lists and compares the features and configuration methods for the prior and current releases.

Table 2–6 myJ2EE Enterprise Deployment Configuration in Prior Releases and the Current Release

Feature	In Prior Releases...	In 10g Release 3 (10.1.3)...
<p>OC4J Instance Creation</p> <p>See Section 5.2.1, "Installing the Application Tier Application Server Instances on APPHOST1 and APPHOST2" on page 5-2</p>	<p>Additional OC4J instances were created Oracle Enterprise Manager 10g Application Server Control Console</p>	<p>Additional OC4J instances are created with the <code>createinstance</code> utility in <code>ORACLE_HOME/bin</code></p>
<p>Application Server Clustering</p> <p>Note: A comprehensive discussion of clustering options, methods, concepts and terminology is provided by Chapters 8 and 9 of the <i>Oracle Containers for J2EE Configuration and Administration Guide</i>.</p>	<p>Creation: An Oracle Application Server instance was designated during installation as a member of an existing file-based or database-based farm, or the founding member of a new farm. Clusters were created within the farm using the Oracle Enterprise Manager 10g Application Server Control Console. The second instance, and all successive instances to join a cluster, adopted the founding cluster member's configuration.</p> <p>Aggregation: One or more clusters (each containing one or more instances) were members of a farm; one farm in each computer.</p> <p>Connectivity: Computers were explicitly specified in the <code>ons.conf</code> file; when computers were added or removed, the file had to be updated and the computer restarted.</p> <p>Status Viewing/Management: Oracle Enterprise Manager 10g Application Server Control Console provided status information on the cluster.</p> <p>The farm's cluster and instance configuration information was stored in the Distributed Configuration Management repository. The <code>dcmctl</code> utility was used to synchronize clusters with the repository configuration, or to update the repository with a cluster's configuration.</p>	<p>Creation: Cluster is created during installation, by providing a multicast address and port to the installer, or after installation, using Oracle Process Manager and Notification Server utilities.</p> <p>Aggregation: A cluster comprises two or more Oracle Application Server instances. The <code><discover></code> element with the instance's host name and port in the <code>ORACLE_HOME/opmn/conf/opmn.xml</code> file enables clustering.</p> <p>Connectivity: The Oracle Process Manager and Notification Server's Oracle Notification Server (ONS) maintains a cluster topology map in the <code>ORACLE_HOME/opmn/conf/opmn.xml</code> file. The instances in the cluster are connected by one of these methods:</p> <ul style="list-style-type: none"> ■ Dynamic node discovery: Each ONS instance (one in each Oracle Application Server instance) transmits a multicast message to make all other ONS instances aware of it. The ONS instances are automatically updated when an instance is added or removed. ■ Static hubs as discovery servers: One or more instances are configured as discovery servers that maintain a cluster topology map. ■ Cross-topology gateway: Gateway instances provide connectivity in topologies that span firewalls or subnets. ■ Manual node configuration: The host address and port for each instance are manually specified in the <code>ORACLE_HOME/conf/opmn.xml</code> file. <p>Status Viewing/Management: The <code>opmnctl</code> utility provides status information on components within a cluster (through the <code>opmnctl @cluster status</code> command). The Cluster Topology link in the Application Server Control Console displays the active instances in the cluster, and the active applications on each instance.</p> <p>Any change to a configuration file must be manually applied to the same configuration file of each OC4J instance in the cluster.</p>

Table 2–6 (Cont.) myJ2EE Enterprise Deployment Configuration in Prior Releases and the Current Release

Feature	In Prior Releases...	In 10g Release 3 (10.1.3)...
Application Clusters for session and state replication Note: A comprehensive discussion of clustering options, methods, concepts and terminology is provided by Chapters 8 and 9 of the <i>Oracle Containers for J2EE Configuration and Administration Guide</i> .	<p>An Oracle Application Server Cluster, containing an OC4J island (a group of OC4J instances across which HTTP session data was replicated), was created. Only Web applications could use the island configuration; EJB applications could not.</p> <p>These XML elements were used to configure clusters:</p> <ul style="list-style-type: none"> ■ <code><cluster-config></code> element in the <code>server.xml</code> file ■ <code>cluster-island</code> attribute of the <code><web-site></code> element in a <code>*web-site.xml</code> configuration file 	<p>Clustering is enabled by the <code><cluster></code> element in the <code>orion-application.xml</code> file of each application in an OC4J instance to be clustered.</p> <p>Clustering can be global for all applications in an OC4J instance, or application-level, for a given application or applications in an OC4J instance.</p> <p>You can specify the scope, timing and attributes of the replicated session or state data.</p>
Request Routing and Load Balancing	<p>The <code>mod_oc4j.conf</code> file was edited to specify routing destinations.</p> <p>The <code>loadbalancer.jar</code> file provided load balancing functionality among OC4J instances.</p>	<p>Load balancing is dynamic; no configuration is required. Oracle HTTP Server instances are updated with information on each OC4J instance (and its deployed applications) in a cluster. You can specify the OC4J instances to which the Oracle HTTP Server routes requests.</p>
Application Authentication and Authorization	<p>The Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider (also referred to as JAZN) LDAP-based provider is used for authentication and authorization to the OC4J applications.</p> <p>This provider is used without Oracle Application Server Single Sign-On, because communication to the data tier is prohibited (Oracle Application Server Single Sign-On requires Portal Services access to the database).</p>	<p>See Section 5.4, "Configuring Application Authentication and Authorization" for instructions.</p>

2.5 Understanding Deployment Variants

Figure 2–1, "Enterprise Deployment Architecture for myJ2EEcompany.com", shows a standard enterprise deployment architecture. Some characteristics of the standard enterprise deployment configuration are:

- A two-node Real Application Clusters (RAC) database on the Data Tier is used to provide high availability (multiple database instances access a shared database of data files).
- Oracle Internet Directory is installed on the Data Tier.
- Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider (on the Application Tier in Figure 2–1), is used for authentication and authorization.

Several variants exist for these and other elements of the enterprise deployment architectures. They are described in this section, categorized by the tier on which they are implemented (Data, Identity Management, Application, or Web). The variants enable you to achieve your deployment goals using fewer servers, different software, or alternative configurations.

For certain types of J2EE applications, such as JMS-based or EJB-based applications, other variants may exist. Refer to the *Oracle Containers for J2EE Configuration and Administration Guide*, the *Oracle Containers for J2EE Developer's Guide* and the *Oracle Containers for J2EE Developer's Guide* for more information on these variants.

2.5.1 Understanding Data Tier Variants

This section describes the variants for the Data Tier. The Data Tier is depicted in [Figure 2–1, "Enterprise Deployment Architecture for myJ2EEcompany.com"](#), and comprises the INFRADBHOST1 and INFRADBHOST2 computers.

2.5.1.1 Using Multimaster Replication with Oracle Internet Directory

Multimaster replication is an Oracle Internet Directory software solution that ensures read and write access to Oracle Internet Directory at all times, if at least one of the directory servers in the system remains available. When an Oracle Directory server resumes functioning after being unavailable, replication from the surviving directory server resumes automatically and synchronizes the contents between the directory servers forming the directory replication group. In addition, any changes made on one directory server instance are reflected on the second directory server instance.

To implement multimaster replication in Oracle Internet Directory, follow the instructions in the *Oracle Internet Directory Administrator's Guide*, Oracle Internet Directory Replication Administration chapter, section titled "Installing and Configuring Multimaster Replication".

2.5.1.2 Using the Oracle Application Server Cold Failover Cluster (Identity Management) Solution

The OracleAS Cold Failover Cluster (Identity Management) solution is a hardware cluster comprising two computers. The computer that is actively executing an Infrastructure installation at any given time is called the primary (hot) node. If this node fails, the hardware cluster automatically diverts Infrastructure operations to the secondary (cold) node.

Each hardware cluster node is a standalone server that runs its own set of processes, but accesses a shared storage subsystem. The cluster can access the same storage, usually disks, from both nodes, but only the primary node has active access to the storage at any given time. If the primary node fails, the hardware cluster's software grants the secondary node access to the storage.

Note: For a detailed discussion of the OracleAS Cold Failover Cluster (Identity Management) solution, see the *Oracle Application Server High Availability Guide*.

The OracleAS Cold Failover Cluster (Identity Management) solution differs from the standard configuration in the following ways:

- The Oracle Internet Directory server and the database are on the same computer, whereas in the standard configuration the first Oracle Internet Directory instance and a database instance occupy OIDHOST1 and INFRADBHOST1, while the second Oracle Internet Directory instance and a database instance occupy OIDHOST2 and INFRADBHOST2. Thus, the OracleAS Cold Failover Cluster (Identity Management) solution operates two fewer servers than the RAC configuration.
- In the event of node failure, clients will experience a brief interruption of service while the workload is diverted to the cold node.

2.5.1.2.1 Implementing the OracleAS Cold Failover Cluster (Identity Management) Solution To implement the OracleAS Cold Failover Cluster (Identity Management) solution:

1. Obtain and configure a hardware cluster.

2. Install and configure the Oracle Application Server instances on the cluster computers to use the OracleAS Cold Failover Cluster (Identity Management) solution. Follow the instructions in the *Oracle Application Server Installation Guide*, section 11.5, "Installing an OracleAS Cold Failover Cluster (Identity Management) Configuration".
3. Manage the OracleAS Cold Failover Cluster (Identity Management) solution, following the instructions from the *Oracle Application Server High Availability Guide*, section 6.3, "Managing Oracle Application Server Cold Failover Cluster (Identity Management)".

2.5.2 Understanding Web Server Tier Variants

This section describes the variants for the Web Server Tier. The Web Server Tier is depicted in [Figure 2–1, "Enterprise Deployment Architecture for myJ2EEcompany.com"](#), the Web Server Tier comprises the WEBHOST1 and WEBHOST2 computers.

2.5.2.1 Oracle Application Server Web Cache Placement, Clustering and Deployment Considerations

OracleAS Web Cache is a content-aware server accelerator, or reverse proxy server, that improves the performance, scalability, and availability of Web sites that run on Oracle Application Server.

Oracle recommends configuring multiple instances of OracleAS Web Cache to run as members of a cache cluster. A cache cluster is a loosely coupled collection of cooperating OracleAS Web Cache cache instances that provide a single logical cache.

When deploying topologies described in this document, one variant is to place OracleAS Web Cache on a separate host. This is particularly useful in environments with large amounts of cacheable content. This architecture modification provides flexibility in choosing the number of computers to operate OracleAS Web Cache, as well as defining separate hardware profile for OracleAS Web Cache servers and J2EE servers. Typically, a large amount of RAM and fast access to file storage are the most critical components in the performance of the OracleAS Web Cache server.

Another possibility is to place a firewall between OracleAS Web Cache and the Oracle HTTP Server; this would provide an additional layer of security.

For additional information on configuration variants with OracleAS Web Cache, see the *Oracle Application Server Web Cache Administrator's Guide*.

2.5.2.2 Oracle HTTP Server: Forward and Reverse Proxies

The architectures described in this guide can be deployed in environments with forward or reverse proxy servers.

Proxy scenarios change the way the clients' IP addresses are seen by the Oracle HTTP Server. This can be adjusted to better match Web applications' expectations by transferring the clients' IP addresses through proxies in HTTP headers and making the HTTP Server use the header values, either with explicit configuration or implicitly, by overall replacing the "physical" request connection information with the header values.

The Oracle HTTP Server and applications in an Oracle HTTP Server handle information about clients. Because clients are often identified by their IP addresses, scenarios in which reverse ("transparent") or forward ("normal") proxies are part of the whole system may require adjustments in how the client's IP addresses are seen by the Oracle HTTP Server.

2.5.2.3 Oracle HTTP Server as a Standalone Web Server

There are two ways to install Oracle HTTP Server on the Web Server Tier: as a standalone Web server, or as part of the Integrated Web Server, J2EE Server and Process Management installation type.

Some security plans discourage installation of any Java executables on the Web Server tier. For this reason, this guide presents the installation of the Oracle HTTP Server as a standalone Web server. The Oracle HTTP Server is managed by the opmnctl utility (invoked by the Start menu on Windows systems) instead of the Oracle Enterprise Manager 10g Application Server Control Console.

2.6 How to Use this Guide: The Enterprise Deployment Configuration Process

This guide contains instructions for configuring the myJ2EE Enterprise Deployment shown in [Figure 2-1](#), using JAZN LDAP authentication and authorization, two Oracle Internet Directory servers and a Load Balancing Router.

The configuration process for myJ2EE is as follows:

1. Install the Metadata Repository on INFRADBHOST1 and INFRADBHOST2, as described in [Section 4.1, "Installing the Oracle Application Server Metadata Repository for the Security Infrastructure"](#) on page 4-1.
2. Install Oracle Internet Directory on OIDHOST1 and OIDHOST2, as described in [Section 4.2, "Installing the Oracle Internet Directory Instances in the Data Tier"](#) on page 4-6.
3. Configure the Load Balancing Router or proxy server and related components, as described in [Section 5.3, "Configuring the Oracle HTTP Server with the Load Balancing Router"](#) on page 5-15.
4. Install an Oracle Application Server Integrated Web Server, J2EE Server and Process Management instance on APPHOST1 and APPHOST2, as described in [Section 5.2.1, "Installing the Application Tier Application Server Instances on APPHOST1 and APPHOST2"](#) on page 5-2.
5. If necessary, create additional OC4J instances in the Oracle Application Server instance on APPHOST1, as described in [Section 5.2.1, "Installing the Application Tier Application Server Instances on APPHOST1 and APPHOST2"](#) on page 5-2.
6. Deploy applications as described in [Section 5.2.3, "Deploying J2EE Applications"](#) on page 5-12.
7. Install an Oracle Application Server Integrated Web Server, J2EE Server and Process Management instance on WEBHOST1 and WEBHOST2, as described in [Section 5.2.2, "Installing the Oracle HTTP Servers on WEBHOST1 and WEBHOST2"](#) on page 5-8.
8. Configure the Oracle HTTP Server with the Load Balancing Router as described in [Section 5.3, "Configuring the Oracle HTTP Server with the Load Balancing Router"](#) on page 5-15.
9. Configure application authentication and authorization with the Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider as described in [Section 5.4, "Configuring Application Authentication and Authorization"](#) on page 5-17.

Before You Begin Installation

This chapter provides recommendations for a successful Enterprise Deployment installation. It contains these topics:

[Section 3.1, "Best Practices for Installing and Configuring Enterprise Deployments"](#) on page 3-1

[Section 3.2, "Hardware Sizing Guidelines"](#) on page 3-2

[Section 3.3, "Managing Oracle Application Server Component Connections"](#) on page 3-2

3.1 Best Practices for Installing and Configuring Enterprise Deployments

Adherence to the following practices may save you time as you install and configure the architectures described in this guide:

- Before each configuration step, make a complete file system backup of the entire Oracle home, capturing the previous step on all computers at the same time. If there is a problem at any point during installation or configuration, you can then return to the previous state by restoring the backup to all computers at the same time.

Note: On UNIX systems, when using the `tar` utility, issue the `tar` or `untar` command as the root user. Some of the executables in Oracle software are owned by root. Backing up files in this way as the root user does not change ownership of the file system, or symbolic links inside folders and subfolders.

- Try to keep user IDs, group IDs, Oracle home paths and directory structures the same on both computers for each component installed.
- Use the static ports feature of the installer when installing components, to ensure that the same ports are used on both computers for each component. (Ideally, you would use the same `staticports.ini` file for the first and second installations of a given installation type on each tier.)

3.2 Hardware Sizing Guidelines

All Enterprise Deployment configurations described in this guide use two servers for each tier to provide failover capability; however, this does not presume adequate computing resources for any application or user population. If the system workload increases such that performance is degraded, you can add servers to the configuration by repeating the instructions for the installation and configuration of the second server on the tier (WEBHOST2, APPHOST2, INFRADBHOST2) to add a third server where it is needed.

To determine hardware needs with a greater degree of precision, you might consider the options presented in [Table 3-1](#).

Table 3-1 Hardware Sizing Options

Option	Benefit	Disadvantage
Create a prototype of the deployment architecture and stress test it	<ul style="list-style-type: none"> ■ Accurate estimate; provides ability to extrapolate ■ Accommodates custom scenarios and complex implementations ■ Incorporates third-party components (firewalls, load balancing router); exposes performance and network-specific issues 	<ul style="list-style-type: none"> ■ Time and effort required to configure ■ Additional software for load simulation required
Use the iSizer tool	<ul style="list-style-type: none"> ■ Fast and easy to use ■ Works best in common implementations with one component for each server 	<ul style="list-style-type: none"> ■ Inexact results for systems with third-party components, many custom implementation details ■ Results difficult to extrapolate in multiple-component architectures

3.3 Managing Oracle Application Server Component Connections

In order to ensure consistent availability of all services, you should ensure that the connection time out values for all Oracle Application Server components are set to a lower time out value than that on the firewall and Load Balancing Router. If the firewall or Load Balancing Router drops a connection without sending a TCP close notification message, then Oracle Application Server components will continue to try to use the connection when it is no longer available.

Installing and Configuring the Security Infrastructure

This chapter provides instructions for creating the Data and Identity Management tiers, distributing the components into the DMZs shown in the Enterprise Deployment architecture depicted in [Figure 2-1, "Enterprise Deployment Architecture for myJ2EEcompany.com"](#) on page 2-4.

Before you perform the tasks in this chapter, a two-node Real Application Clusters (RAC) database must be installed. In this chapter, the server names for the database hosts are INFRADBHOST1 and INFRADBHOST2.

This chapter contains the following topics:

[Section 4.1, "Installing the Oracle Application Server Metadata Repository for the Security Infrastructure"](#) on page 4-1

[Section 4.2, "Installing the Oracle Internet Directory Instances in the Data Tier"](#) on page 4-6

[Section 4.3, "Configuring the Virtual Server to Use the Load Balancing Router"](#) on page 4-18

[Section 4.4, "Testing the Data Tier Components"](#) on page 4-19

4.1 Installing the Oracle Application Server Metadata Repository for the Security Infrastructure

You must install the 10g Release 2 (10.1.2) OracleAS Metadata Repository before you install components into the Security DMZ. Oracle Application Server provides a tool, the Oracle Application Server Repository Creation Assistant, to create the OracleAS Metadata Repository in an existing database.

The 10g Release 2 (10.1.2) OracleAS RepCA is available on the OracleAS RepCA CD-ROM or the Oracle Application Server DVD-ROM. You install the OracleAS RepCA in its own, separate Oracle home.

To install the OracleAS Metadata Repository, you must perform these steps:

1. Install the OracleAS RepCA, following the steps in [Section 4.1.1](#).
2. Ensure that the database meets the requirements specified in the "Database Requirements" section of the *Oracle Application Server Metadata Repository Creation Assistant User's Guide*. You can find this guide in the Oracle Application Server platform documentation library for the platform and version you are using. In addition, ensure that:

- The database computer has at least 512 MB of swap space available for execution of the OracleAS RepCA
 - There are no dependencies of any kind related to the `ultrasearch` directory in the database's Oracle home. The OracleAS RepCA replaces this directory with a new version, renaming the existing version of the directory to `ultrasearch_timestamp`.
3. Execute the OracleAS RepCA, following the steps in [Section 4.1.2](#) or [Section 4.1.3](#).
 - To install into a database using raw devices, follow the steps in [Section 4.1.2](#), "Installing the Metadata Repository in a Database Using Raw Devices" on page 4-3.
 - To install into a database using Oracle Cluster File System, follow the steps in [Section 4.1.3](#), "Installing the Metadata Repository in an Oracle Cluster File System (OCFS)" on page 4-4.
 4. Perform the post-installation step described in [Section 4.1.4](#).

4.1.1 Installing the OracleAS RepCA

Follow these steps to install the 10g Release 2 (10.1.2) OracleAS RepCA into its own Oracle home:

1. Insert the OracleAS RepCA CD-ROM or the Oracle Application Server DVD-ROM.

Note: If your computer does not mount CD-ROMs or DVD-ROMs automatically, you must set the mount point manually.

2. Start the installer, using the method corresponding to the installation media:
(CD-ROM)
On UNIX, issue this command: `runInstaller`
On Windows, double-click `setup.exe`
(DVD-ROM) Navigate to the `repca_utilities` directory and do one of the following:
On UNIX, issue this command: `runInstaller`
On Windows, double-click `setup.exe`
The **Welcome** screen appears.
3. Click **Next**.
The **Specify File Locations** screen appears.
4. In the **Name** field, specify a name for the OracleAS RepCA Oracle home. The Oracle home name must contain only alphanumeric characters and the underscore character, and be 128 characters or fewer.
In the **Destination** field, enter the full path to a new Oracle home in which to install the OracleAS RepCA, and click **Next**.
5. The **Launch Repository Creation Assistant** screen appears.
6. Select **No** and click **Next**.
The **Summary** screen appears.

7. Click **Install**.

The Configuration Assistants screen appears, executing the OracleAS RepCA, and indicating "In Progress".

8. When the OracleAS RepCA is no longer running, exit the OracleAS RepCA.

The **End of Installation** screen appears.

9. Click **Exit**, and then confirm your choice to exit.

4.1.2 Installing the Metadata Repository in a Database Using Raw Devices

Follow these steps to install the 10g Release 2 (10.1.2) Metadata Repository into an existing two-node Real Application Clusters (RAC) database using raw devices:

1. Create raw devices for the OracleAS Metadata Repository, using the values in [Section A.2, "Tablespace Mapping to Raw Devices Sample File"](#) on page A-2.

Tip: The command to create tablespaces is specific to the volume manager used. For example, the command to create a tablespace in VERITAS Volume Manager is `vxassist`.

2. Create a file to map the tablespaces to the raw devices. Each line in the file has the format:

```
tablespace name=raw device file path
```

You can use the sample file shown in [Example A-1, "Tablespace to Raw Device Mapping \(Sample File\)"](#) on page A-2, replacing the file paths with the paths on your system. Append a 1 to the tablespace names, as shown in the sample file.

Note: Creating the sample file is not mandatory; you can enter the tablespace values into the Specify Tablespace Information screen during execution of the OracleAS RepCA.

3. Populate the `DBCA_RAW_CONFIG` environment variable with the full path and filename of the tablespace mapping file.

4. Ensure that the database and listener are running.

5. Ensure that the `NLS_LANG` environment variable is not set to a non-English locale, or is set to `american_america.us7ascii`, with one of the following commands:

UNIX:

- `unsetenv NLS_LANG`
- `setenv NLS_LANG american_america.us7ascii`

Windows:

- `set NLS_LANG=`
- `set NLS_LANG=american_america.us7ascii`

Note: If you need to, you can set `NLS_LANG` to its original value after executing the OracleAS RepCA.

6. Start the OracleAS RepCA from the OracleAS RepCA Oracle home with this command:
runRepca
The **Welcome** screen appears.
7. Click **Next**.
The **Specify Oracle Home** screen appears.
8. In the **Oracle Home** field, specify the full path of the database Oracle home.
In the **Log File Directory** field, specify the full path of the directory on the current computer in which you want the OracleAS RepCA to write its log files. Ensure correct input for the **Log File Directory** on this screen, as you will not be able to change it after you have proceeded beyond this screen.
9. Click **Next**.
The **Select Operation** screen appears.
10. Select **Load** and click **Next**.
The **Specify Database Connection** screen appears.
11. Enter the SYS user name and password and the host and port information. For example:
`infradbhost1.mycompany.com:1521,infradbhost2.mycompany.com:1521`
12. Click **Next**.
The **Specify Storage Options** screen appears.
13. Select **Regular or Cluster File System**.
The **Specify Tablespace Information** screen appears, displaying the values from the file specified by the DBCA_RAW_CONFIG environment variable.
14. Correct the values, if necessary, and click **Next**.
The **Warning: Check Disk Space** dialog appears if your SYSTEM and UNDO tablespaces are set to autoextend.
15. Check the disk space as specified in the dialog and click **OK**.
The **Loading Repository** screen appears. The tablespaces and schemas are created and populated.
The **Success** screen appears.
16. Click **OK**.
The OracleAS RepCA exits.

If the installation was unsuccessful, or you need more information, see the *Oracle Application Server Metadata Repository Creation Assistant User's Guide*.

4.1.3 Installing the Metadata Repository in an Oracle Cluster File System (OCFS)

Follow these steps to install the 10g Release 2 (10.1.2) Metadata Repository into an existing two-node Real Application Clusters (RAC) database using an OCFS file system:

1. Ensure that the database and listener are running.

2. Start the OracleAS RepCA from the OracleAS RepCA Oracle home with this command:

```
runRepca
```

The **Welcome** screen appears.

3. Click **Next**.

The **Specify Oracle Home** screen appears.

4. In the **Oracle Home** field, specify the full path of the database Oracle home.

In the **Log File Directory** field, specify the full path of the directory on the current computer in which you want the OracleAS RepCA to write its log files. Ensure correct input for the **Log File Directory** on this screen, as you will not be able to change it after you have proceeded beyond this screen.

5. Click **Next**.

The **Select Operation** screen appears.

6. Select **Load** and click **Next**.

The **Specify Database Connection** screen appears.

7. Enter the SYS user password, select the **Real Application Clusters Database** option, and enter the host and port information. For example:

```
infradbhost1.mycompany.com:1521,infradbhost2.mycompany.com:1521
```

Enter the service name.

8. Click **Next**.

The **Specify Storage Options** screen appears.

9. Select **Regular or Cluster File System**.

The **Specify Tablespace Information** screen appears.

10. Select a directory option (**Use Same Directory for All Tablespaces** or **Use Individual Directories for Each Tablespace**) and complete the remaining fields. When specifying a directory, ensure that it is an existing, writable directory with sufficient free space. Click **Next**.

The **Warning: Check Disk Space** dialog appears if your SYSTEM and UNDO tablespaces are set to autoextend.

11. Check the disk space as specified in the dialog and click **OK**.

The **Loading Repository** screen appears. The tablespaces and schemas are created and populated.

The **Success** screen appears.

12. Click **OK**.

The OracleAS RepCA exits.

If the installation was unsuccessful, or you need more information, see the *Oracle Application Server Metadata Repository Creation Assistant User's Guide*.

4.1.4 Configuring the Time out Value in the sqlnet.ora File

You must configure the `SQLNET.EXPIRE_TIME` parameter in the `sqlnet.ora` file on the application infrastructure database.

1. Open the file `ORACLE_HOME/network/admin/sqlnet.ora` file (UNIX) or the `ORACLE_BASE/ORACLE_HOME/network/admin/sqlnet.ora` file (Windows).
2. Set the `SQLNET.EXPIRE_TIME` parameter to a value lower than the TCP session time out value for the Load Balancing Router and firewall.
3. Restart the listener by issuing these commands in `ORACLE_HOME/bin`:

```
lsnrctl stop
lsnrctl start
```

4.2 Installing the Oracle Internet Directory Instances in the Data Tier

Follow these steps to install the Oracle Internet Directory components (OIDHOST1 and OIDHOST2) into the data tier with the Metadata Repository. The procedures are very similar, but the selections in the configuration options screen differ.

Note: Ensure that the clocks are synchronized between the two computers on which you intend to install the Oracle Internet Directory instances. Errors will occur if this is not done.

4.2.1 Installing the First Oracle Internet Directory

The OracleAS Metadata Repository must be running before you perform this task. Follow these steps to install the 10g Release 2 (10.1.2) Oracle Internet Directory on OIDHOST1:

1. Ensure that the system, patch, kernel and other requirements are met. These are listed in the *Oracle Application Server Quick Installation Guide* in the Oracle Application Server platform documentation library for the platform and version you are using.
2. Ensure that ports 389 and 636 are not in use by any service on the computer by issuing these commands for the operating system you are using. (If the port is not in use, no output is returned from the command.)

On UNIX:

```
netstat -an | grep "389"
netstat -an | grep "636"
```

On Windows:

```
netstat -an | findstr :389
netstat -an | findstr :636
```

If the port is in use (if the command returns output identifying the port), you must free the port.

In UNIX:

Remove the entries for ports 389 and 636 in the `/etc/services` file and restart the services, or restart the computer.

In Windows:

Stop the component that is using the port.

3. Copy the `staticport.ini` file from the `Disk1/stage/Response` directory to the Oracle home directory.
4. Edit the `staticport.ini` file to assign the following custom ports:

```
Oracle Internet Directory port = 389
Oracle Internet Directory (SSL) port = 636
```

Note: See [Section A.3, "Using the Static Ports Feature with Oracle Universal Installer"](#) on page A-1 for more information.

5. Start the Oracle Universal Installer as follows:

On UNIX, issue this command: **runInstaller**

On Windows, double-click **setup.exe**

The **Welcome** screen appears.

6. Click **Next**.

On UNIX systems, the **Specify Inventory Directory and Credentials** screen appears.

7. Specify the directory you want to be the `oraInventory` directory and the operating system group that has permission to write to it.

8. Click **Next**.

On UNIX systems, a dialog appears, prompting you to run the `oraInstRoot.sh` script.

9. Open a window and run the script, following the prompts in the window.

10. Return to the Oracle Universal Installer screen and click **Next**.

The **Specify File Locations** screen appears with default locations for:

- The product files for the installation (Source)
- The name and path to an Oracle home (Destination)

Note: Ensure that the Oracle home directory path for `OIDHOST1` is the same as the path to the Oracle home location of `OIDHOST2`. For example, if the path to the Oracle home on `OIDHOST1` is:

```
/u01/app/oracle/product/AS10gOID
```

then the path to the Oracle home on `OIDHOST2` must be:

```
/u01/app/oracle/product/AS10gOID
```

11. Specify the **Destination Name** and **Path**, if different from the default, and click **Next**.

The **Select a Product to Install** screen appears.

Figure 4–1 Oracle Universal Installer Select a Product to Install Screen



12. Select OracleAS Infrastructure 10g, as shown in [Figure 4–1](#), and click **Next**.
The **Select Installation Type** screen appears.
13. Select **Identity Management**, as shown in [Figure 4–2](#), and click **Next**.

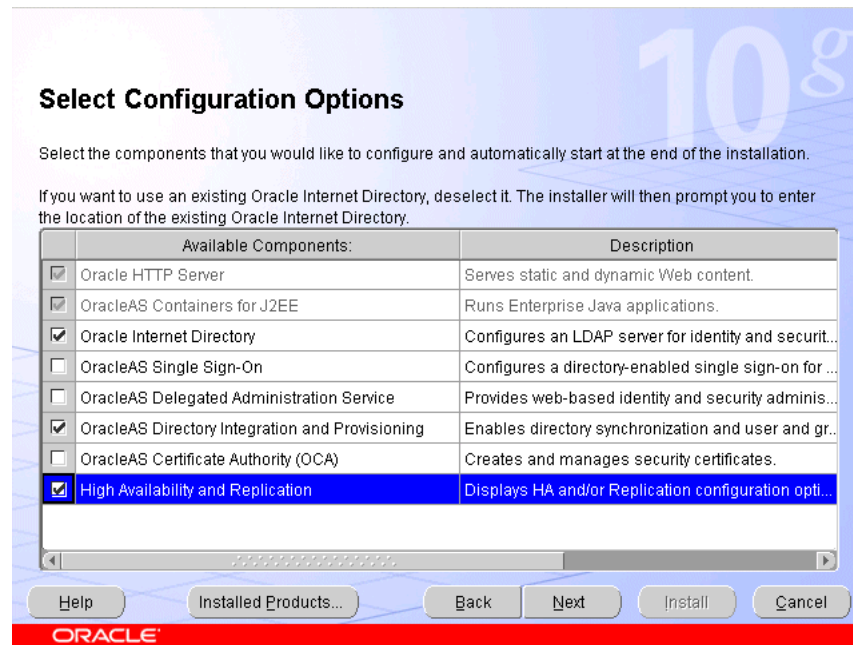
Figure 4–2 Oracle Universal Installer Select Installation Type Screen



- The **Product-Specific Prerequisite Checks** screen appears.
14. Click **Next**.
The **Confirm Pre-Installation Requirements** screen appears.

15. Ensure that the requirements are met, check the box for each, and click **Next**.
The **Select Configuration Options** screen appears.

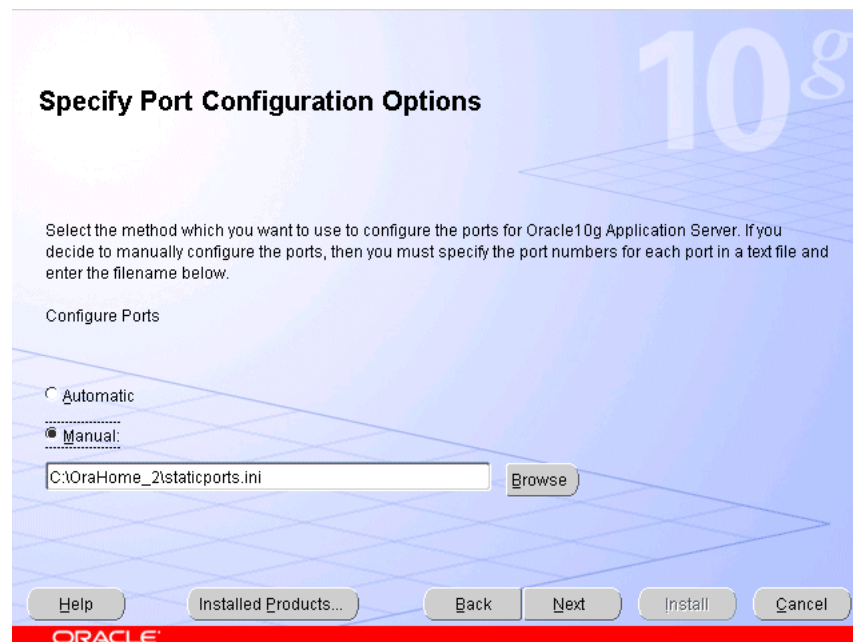
Figure 4–3 Oracle Universal Installer Select Configuration Options Screen



16. Select **Oracle Internet Directory**, **OracleAS Directory Integration and Provisioning**, and **High Availability and Replication**, as shown in [Figure 4–3](#), and click **Next**.

The **Specify Port Configuration Options** screen appears.

Figure 4–4 Oracle Universal Installer Specify Port Configuration Options Screen



17. Select **Manual**, as shown in [Figure 4-4](#), and click **Next**.

The **Specify Repository** screen appears.

18. Provide the DBA login and computer information as shown in [Figure 4-5](#) and click **Next**.

Figure 4-5 Oracle Universal Installer Specify Repository Screen

The **Select High Availability or Replication Option** screen appears.

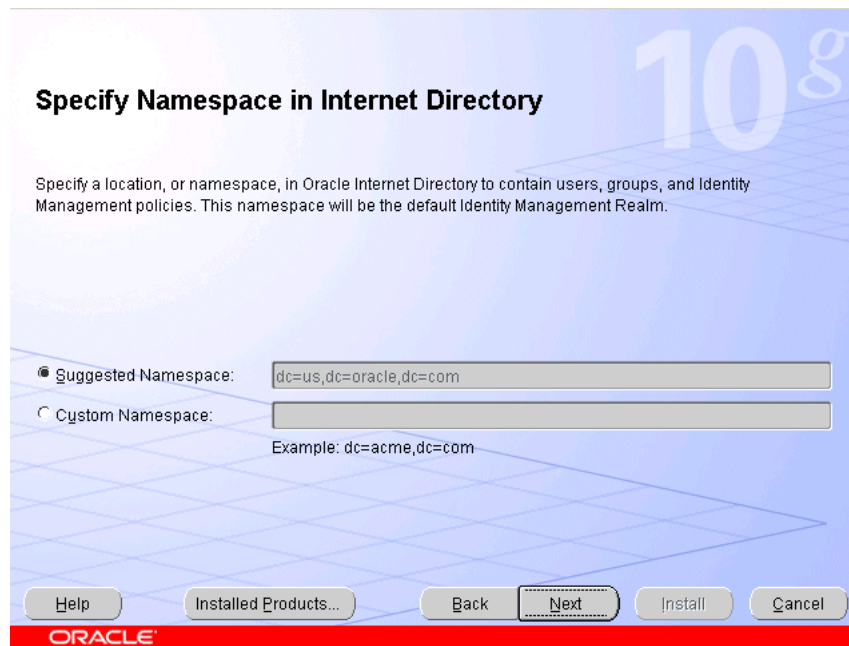
19. Select **OracleAS Cluster (Identity Management)**, as shown in [Figure 4-6](#), and click **Next**.

Figure 4–6 Oracle Universal Installer Select High Availability or Replication Option Screen



The **Specify Namespace in Internet Directory** screen appears.

Figure 4–7 Oracle Universal Installer Specify Namespace in Internet Directory



20. Click **Next** to specify the default **Suggested Namespace** shown in [Figure 4–7](#), or enter values for the **Custom Namespace** and click **Next**.

The **Specify Instance Name and ias_admin Password** screen appears.

21. Specify the instance name and password and click **Next**.

The **Summary** screen appears.

22. Review the selections to ensure that they are correct (if they are not, click **Back** to modify selections on previous screens), and click **Install**.

The **Install** screen appears with a progress bar. On UNIX systems, a dialog opens prompting you to run the `root.sh` script.

23. Open a window and run the script.

The **Configuration Assistants** screen appears. Multiple configuration assistants are launched in succession; this process can be lengthy. When it completes, the **End of Installation** screen appears.

24. Click **Exit**, and then confirm your choice to exit.

4.2.2 Installing the Second Oracle Internet Directory

The OracleAS Metadata Repository and the first Oracle Internet Directory must be running before you perform this task. Follow these steps to install the 10g Release 2 (10.1.2) Oracle Internet Directory on `OIDHOST2`:

1. Ensure that the system, patch, kernel and other requirements are met. These are listed in the *Oracle Application Server Quick Installation Guide* in the Oracle Application Server platform documentation library for the platform and version you are using.
2. Ensure that ports 389 and 636 are not in use by any service on the computer by issuing these commands for the operating system you are using. (If the port is not in use, no output is returned from the command.)

On UNIX:

```
netstat -an | grep "389"
```

```
netstat -an | grep "636"
```

On Windows:

```
netstat -an | findstr :389
```

```
netstat -an | findstr :636
```

If the port is in use (if the command returns output identifying the port), you must free the port.

In UNIX:

Remove the entries for ports 389 and 636 in the `/etc/services` file and restart the services, or restart the computer.

In Windows:

Stop the component that is using the port.

3. Copy the `staticport.ini` file from the `Disk1/stage/Response` directory to the Oracle home directory.
4. Edit the `staticport.ini` file and uncomment, and update these entries:

```
Oracle Internet Directory port = 389
Oracle Internet Directory (SSL) port = 636
```

Note: See [Section A.3, "Using the Static Ports Feature with Oracle Universal Installer"](#) on page A-1 for more information.

5. Start the Oracle Universal Installer as follows:

On UNIX, issue this command: **runInstaller**

On Windows, double-click **setup.exe**

The **Welcome** screen appears.

6. Click **Next**.

On UNIX systems, the **Specify Inventory Directory and Credentials** screen appears.

7. Specify the directory you want to be the `oraInventory` directory and the operating system group that has permission to write to it.

8. Click **Next**.

On UNIX systems, a dialog appears, prompting you to run the `oraInstRoot.sh` script.

9. Open a window and run the script, following the prompts in the window.

10. Return to the Oracle Universal Installer screen and click **Next**.

The **Specify File Locations** screen appears with default locations for:

- The product files for the installation (Source)
- The name and path to an Oracle home (Destination)

Note: Ensure that the Oracle home directory path for `OIDHOST1` is the same as the path to the Oracle home location of `OIDHOST2`. For example, if the path to the Oracle home on `OIDHOST1` is:

```
/u01/app/oracle/product/AS10gOID
```

then the path to the Oracle home on `OIDHOST2` must be:

```
/u01/app/oracle/product/AS10gOID
```

11. Specify the **Destination Name** and **Path**, if different from the default, and click **Next**.

The **Select a Product to Install** screen appears.

Figure 4–8 Oracle Universal Installer Select a Product to Install Screen

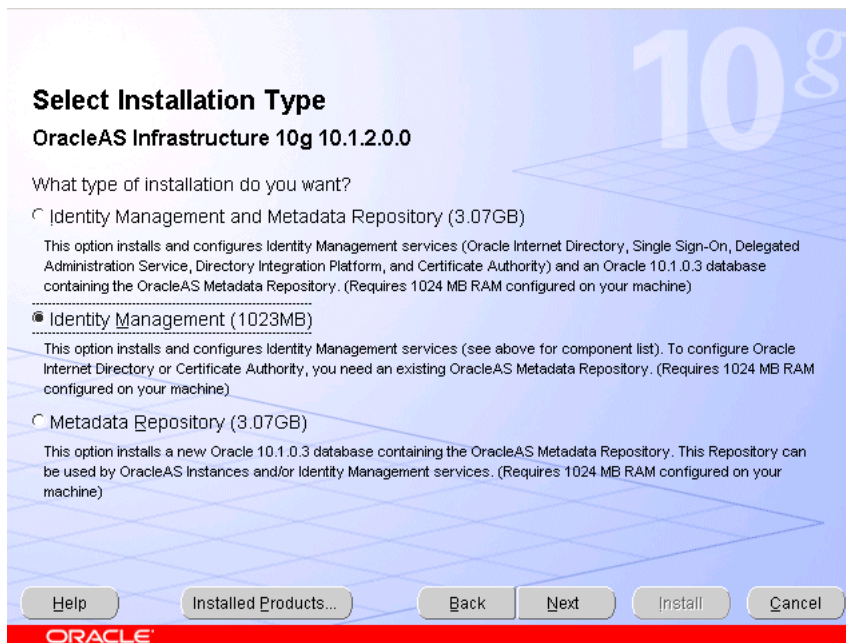


12. Select OracleAS Infrastructure 10g, as shown in Figure 4–8, and click Next.

The **Select Installation Type** screen appears.

13. Select **Identity Management**, as shown in Figure 4–9, and click Next.

Figure 4–9 Oracle Universal Installer Select Installation Type Screen



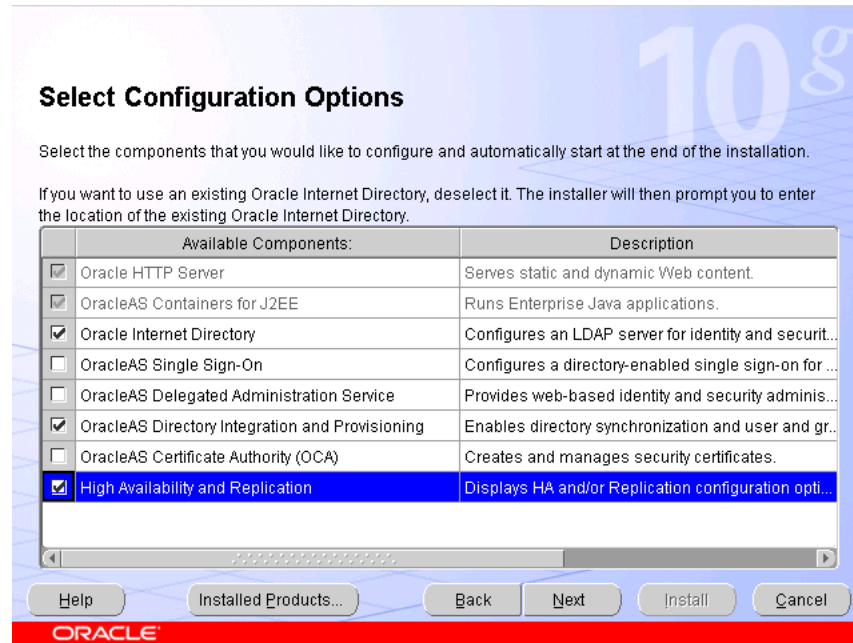
The **Product-specific Prerequisite Checks** screen appears.

14. Click Next.

The **Confirm Pre-Installation Requirements** screen appears.

15. Ensure that the requirements are met, check the box for each, and click **Next**.
The **Select Configuration Options** screen appears.

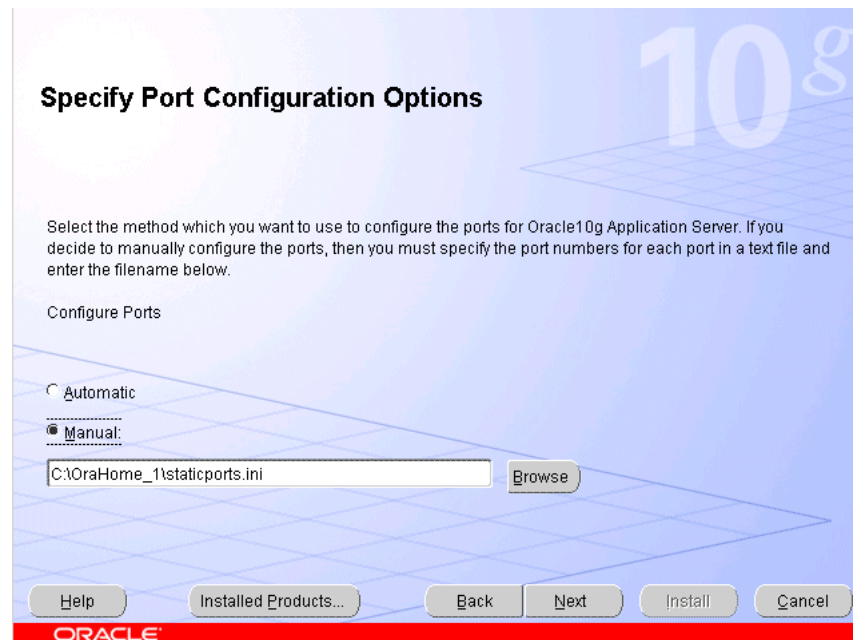
Figure 4–10 Oracle Universal Installer Select Configuration Options Screen



16. Select **Oracle Internet Directory**, **OracleAS Directory Integration and Provisioning**, and **High Availability and Replication**, as shown in [Figure 4–10](#), and click **Next**.

The **Specify Port Configuration Options** screen appears.

Figure 4–11 Oracle Universal Installer Specify Port Configuration Options Screen



17. Select **Manual**, as shown in [Figure 4–11](#), and click **Next**.

The **Specify Repository** screen appears.

18. Provide the DBA login and computer information as shown in [Figure 4–12](#) and click **Next**.

Figure 4–12 Oracle Universal Installer Specify Repository Screen

A dialog opens, prompting you to synchronize the system time of the primary Oracle Internet Directory computer and the system time on the computer on which you are installing.

19. Synchronize the system time on the computers and click **OK**.

The **Specify ODS Password** screen appears.

20. Specify the ODS password (by default, the `ias_admin` password) as shown in [Figure 4–13](#) and click **Next**.

Figure 4–13 Oracle Universal Installer Specify ODS Password Screen

Specify ODS Password

Specify the password for the ODS Schema for this Metadata Repository.

Password:

Help Installed Products... Back Next Install Cancel

ORACLE

The **Register with Oracle Internet Directory** screen appears.

21. Specify the host name and port, as shown in [Figure 4–14](#), and click **Next**.

Figure 4–14 Oracle Universal Installer Register with Oracle Internet Directory Screen

Register with Oracle Internet Directory

To register this instance of OracleAS Infrastructure with an existing Oracle Internet Directory, enter the connect information for the Internet Directory. If you do not have Oracle Internet Directory installed, return to the Select Configuration Options screen and select Oracle Internet Directory.

Hostname:

Port:

Use only SSL connections with this Oracle Internet Directory

Help Installed Products... Back Next Install Cancel

ORACLE

The **Specify OID Login** screen appears.

22. Specify the user name and password, as shown in [Figure 4–15](#), and click **Next**.

Figure 4–15 Oracle Universal Installer Specify OID Login Screen

The **Specify Instance Name and ias_admin Password** screen appears.

23. Specify the instance name and password and click **Next**.

The **Summary** screen appears.

24. Review the selections to ensure that they are correct (if they are not, click **Back** to modify selections on previous screens), and click **Install**.

The **Install** screen appears with a progress bar. On UNIX systems, a dialog opens prompting you to run the `root.sh` script.

25. Open a window and run the script.

The **Configuration Assistants** screen appears. Multiple configuration assistants are launched in succession; this process can be lengthy. When it completes, the **End of Installation** screen appears.

26. Click **Exit**, and then confirm your choice to exit.

4.3 Configuring the Virtual Server to Use the Load Balancing Router

You must configure the Load Balancing Router to perform these functions:

- Listen on `oid.mycompany.com`.
- Balance the requests received on ports 389 and 636 to `oidhost1.mycompany.com` and `oidhost2.mycompany.com` on ports 389 and 636.
- Monitor the heartbeat of the Oracle Internet Directory processes on both computers. If an Oracle Internet Directory process stops on one of the computers, the Load Balancing Router must route the LDAP traffic to the surviving computer.

Note: Some tuning of the Load Balancing Router's monitoring interval and time out values may be required to ensure system availability. If the interval or time out value is too long, the Load Balancing Router will not detect service failures in time; if it is too short, the Load Balancing Router may incorrectly infer that a server is down.

For example, suppose the Load Balancing Router maps the virtual IP address `oid.mycompany.com` to the two Oracle Internet Directory servers for round robin load balancing, and the monitoring scheme attempts an `ldapbind` at 10-second intervals.

If the Oracle Internet Directory on `APPHOST1` is down, then the Load Balancing Router directs all traffic to the Oracle Internet Directory on `APPHOST2` only.

However, there is a 10-second interval during which the Load Balancing Router is unaware that the Oracle Internet Directory on `APPHOST1` is down. There is also a 30-second time out period. During this period, the Load Balancing Router continues to direct traffic to both Oracle Internet Directory servers in round robin mode, and `ldapbind` failures will occur when it attempts connections to the Oracle Internet Directory on `APPHOST1`.

4.4 Testing the Data Tier Components

Perform these steps to test the Data Tier components:

1. Ensure that you can connect to each Oracle Internet Directory instance and the Load Balancing Router, using this command:

```
ldapbind -p 389 -h OIHOST1
```

```
ldapbind -p 389 -h OIHOST2
```

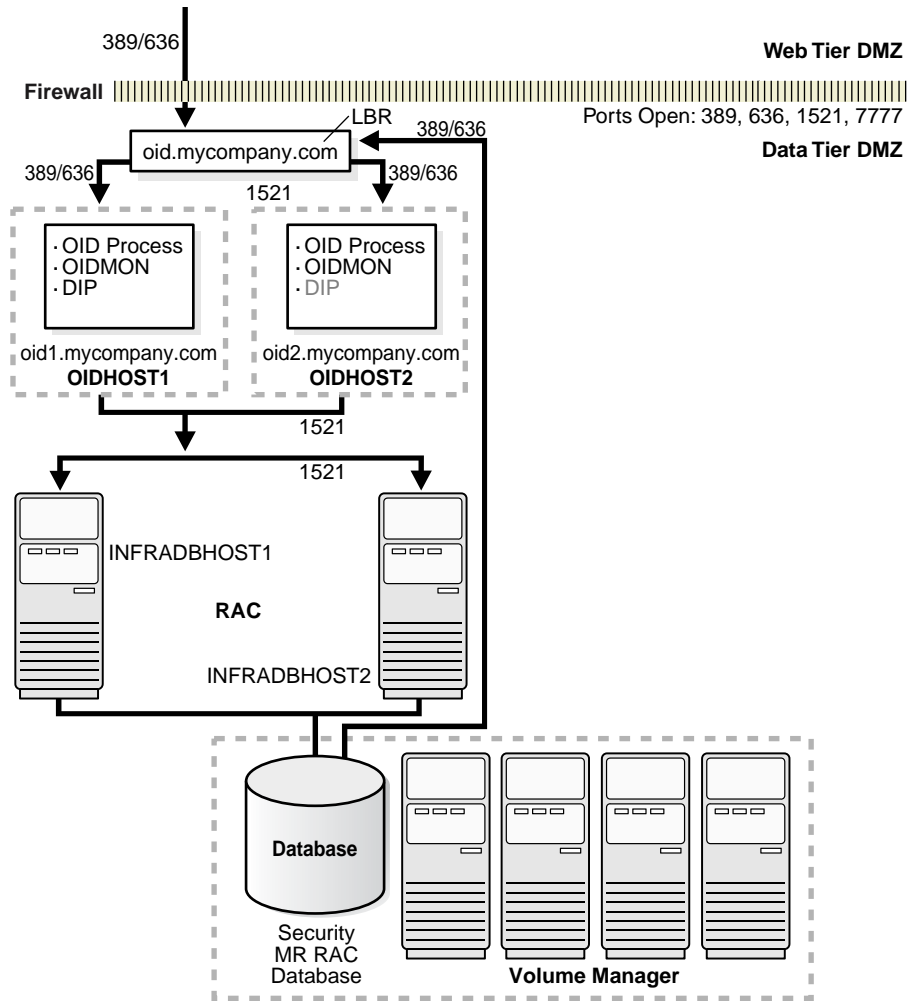
```
ldapbind -p 389 -h oid.mycompany.com
```

2. Start the `oidadmin` tool on each Oracle Internet Directory instance in `ORACLE_HOME/bin` with this command:

```
oidadmin
```

The Data Tier configuration is now as shown in [Figure 4-16](#).

Figure 4–16 Data Tier Configuration



Installing and Configuring the myJ2EECompany Application Infrastructure

This chapter provides instructions for creating the Data, Application and Web Server tiers, distributing the software components into the DMZs shown in the Enterprise Deployment architecture for myJ2EECompany shown in [Figure 2-1](#). Although Oracle Internet Directory is the LDAP server shown, you could use another server, such as iPlanet or Active Directory.

This chapter contains the following topics:

[Section 5.1, "Installing and Configuring the Security Infrastructure"](#) on page 5-1

[Section 5.2, "Installing and Configuring the Application and Web Tiers"](#) on page 5-2

[Section 5.3, "Configuring the Oracle HTTP Server with the Load Balancing Router"](#) on page 5-15

[Section 5.4, "Configuring Application Authentication and Authorization"](#) on page 5-17

5.1 Installing and Configuring the Security Infrastructure

The security infrastructure for myJ2EECompany contains the components depicted in [Figure 4-16, "Data Tier Configuration"](#). The Oracle Internet Directory administration utility `oiddas` is required for Oracle Internet Directory administration. `oiddas` is installed in the application server environment with the Oracle Internet Directory server.

To install and configure this security infrastructure:

1. Follow all instructions in [Section 4.1, "Installing the Oracle Application Server Metadata Repository for the Security Infrastructure"](#) on page 4-1.
2. Follow all instructions in [Section 4.2, "Installing the Oracle Internet Directory Instances in the Data Tier"](#) on page 4-6.
3. Follow all instructions in [Section 4.3, "Configuring the Virtual Server to Use the Load Balancing Router"](#) on page 4-18.
4. Follow all instructions in [Section 4.4, "Testing the Data Tier Components"](#) on page 4-19.

5.2 Installing and Configuring the Application and Web Tiers

The application tier consists of multiple computers hosting middle tier Oracle Application Server instances. Each instance can contain multiple Oracle Containers for J2EE instances on which you deploy applications. In the complete configuration, requests are balanced among the OC4J instances on the application tier computers to create a performant and fault tolerant application environment.

The web tier consists of Oracle HTTP Servers. [Figure 2-1, "Enterprise Deployment Architecture for myJ2EEcompany.com"](#) on page 2-4, shows the application tier (APPHOST1 and APPHOST2) and the web tier (WEBHOST1 and WEBHOST2).

5.2.1 Installing the Application Tier Application Server Instances on APPHOST1 and APPHOST2

You can install an Oracle Application Server instance consisting only of one OC4J instance, using the Advanced installation option of the Oracle Universal Installer. Follow these steps to install and create the instances on APPHOST1 and APPHOST2:

1. Ensure that the system, patch, kernel and other requirements are met as specified in the *Oracle Application Server Installation Guide*. You can find this guide in the Oracle Application Server platform documentation library for the platform and version you are using.

2. Start the Oracle Universal Installer as follows:

On UNIX, issue this command: **runInstaller**

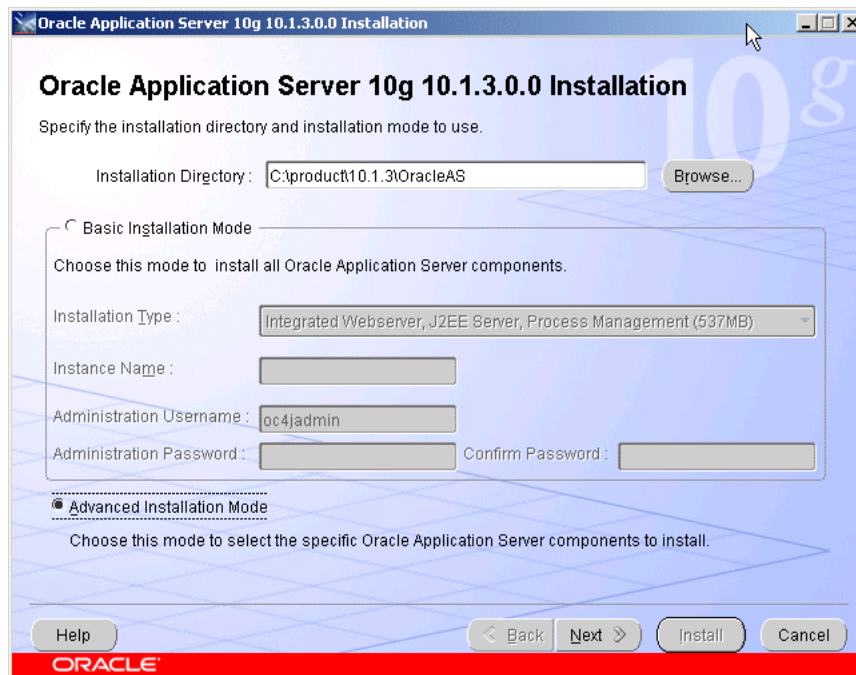
On Windows, double-click **setup.exe**

The **Oracle Application Server 10.1.3.0.0 Installation** screen appears with the Basic Installation Mode and the Integrated Web Server, J2EE Web Server and Process Management installation type selected.

3. Specify an installation directory for the instance, or leave the default.
4. Select the **Advanced Installation Mode** and click **Next**.

A confirmation dialog appears.

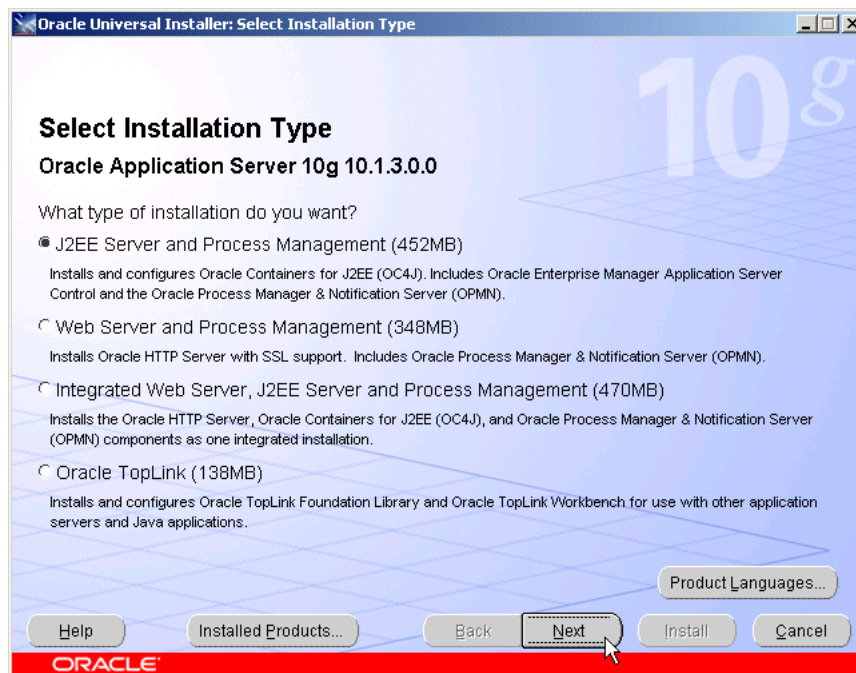
Figure 5–1 Oracle Universal Installer Oracle Application Server 10.1.3.0.0 Installation Screen with Advanced Installation Mode Selected



5. Click **Yes**.

A progress dialog appears, then the **Select Installation Type** screen appears.

Figure 5–2 Oracle Universal Installer Select Installation Type Screen



6. Select the **J2EE Server and Process Management** option and click **Next**.

The **Specify Port Configuration Options** screen appears.

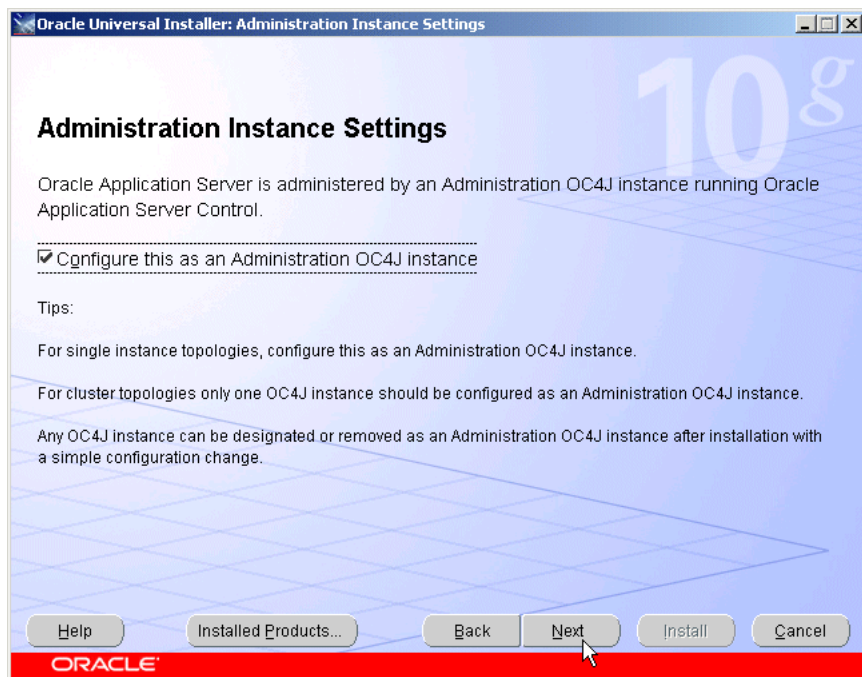
Figure 5–3 Oracle Universal Installer Specify Port Configuration Options Screen



7. Select **Automatic** and click **Next**.

The **Administration Instance Settings** screen appears.

Figure 5–4 Oracle Universal Installer Administration Instance Settings Screen



8. Check the box to designate the instance installed on APPHOST1 as an administration OC4J instance.
9. Click **Next**.

The **Administration Settings** screen appears.

Figure 5–5 Oracle Universal Installer Administration Settings Screen

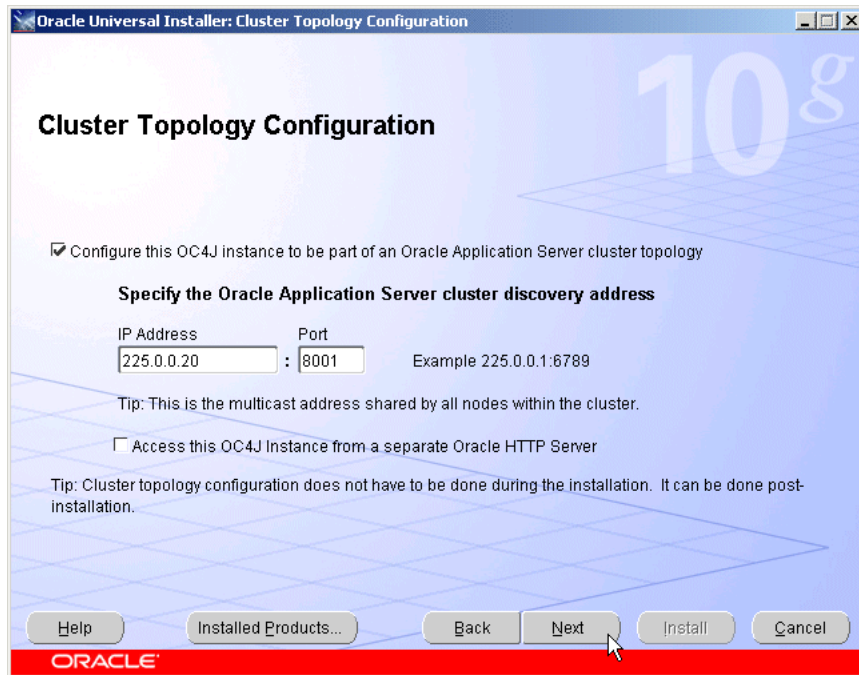
10. Specify an instance name for the application server instance.

Note: The instance name you specify will be prepended to the host name. For example, if you specify J2EE as the instance name and the host name is `server1.mycompany.com`, the instance name will be `J2EE.server1.mycompany.com`.

11. Specify and confirm the administrator password for the default OC4J instance.
12. Specify a name for the default OC4J instance created by the installer (the default is `home`), such as `Admin`, or a similar name that designates it as the instance dedicated to Application Server Control, and click **Next**.

Note: You will not deploy applications to this instance; it will not be clustered with the user-created OC4J instances on which applications are deployed.

The **Cluster Topology Configuration** screen appears.

Figure 5–6 Oracle Universal Installer Cluster Topology Configuration Screen

13. Specify the multicast address and port.
14. Leave the checkbox blank for the option **Access this OC4J instance from a separate Oracle HTTP Server** for the OC4J Admin instance installed on APPHOST1.
15. Click **Next**.
The **Summary** screen appears.
16. Click **Install**.
The **Preparing to Install** dialog appears, then the **Install** screen appears.
17. The **Configuration Assistants** screen appears. When the configuration process completes, the **End of Installation** screen appears.
18. Click **Exit**, and then confirm your choice to exit.
19. Use the `netstat` command to identify an unoccupied HTTP port:
netstat -an
20. Create one or more OC4J instances for application deployment by performing these steps:
 - a. Issue this command in `APPHOST1_ORACLE_HOME/BIN`:
createinstance -instancename *Apps* -port *HTTP port*
In the preceding command, *Apps* is the instance name and *HTTP port* is an unoccupied http port. Use the same instance name for all of the instances, so that the OC4J instances will be members of the same group.
The following message appears:
Creating OC4J instance "Apps"...

Set OC4J administrator's password for "Apps" (password text will not be displayed as it is entered):

- b. Provide and confirm a password.

Note: The instances in a group of OC4J instances must have the same password, so that the user specified in a deployment command can deploy to the entire group.

The following message appears:

```
The password for OC4J administrator "oc4jadmin" has been
set.
```

```
New OC4J instance "Apps" is created.
```

Note: An OC4J instance that you create does not have its own OC4J binary libraries; it uses the libraries installed in the instance created by the installer.

21. Start the newly created instance by issuing this command in `APPHOST1_ORACLE_HOME/OPMN/BIN`:

```
opmnctl startproc process-type=Apps
```

In the preceding command, *Apps* is the name you gave the OC4J instance when creating it.

22. Ensure that the AJP ports in the series 12501, 12502... are not in use by issuing the `netstat` command:

```
netstat -an
```

23. Specify the AJP port by issuing this command in `APPHOST1_ORACLE_HOME/OPMN/BIN`:

```
opmnctl config port update ias-component=OC4J
process-type=Apps portid=default-web-site protocol=ajp
range=12501
```

In the preceding command, *Apps* is the name you gave the OC4J instance when creating it.

24. Restart OPMN by issuing this command in `APPHOST1_ORACLE_HOME/OPMN/BIN`:

```
opmnctl reload
```

25. Verify that the installation was successful by viewing the instance in Oracle Enterprise Manager 10g. Start a browser and access the OC4J Admin instance at:

```
http://APPHOST1:8888/em
```

Note: The `ORACLE_HOME/install/readme.txt` file contains the URLs for the installation and a command to verify the status of processes.

26. Repeat Steps 1 through 24 to install the second Oracle Application Server instance on APPHOST2 and create OC4J instances, specifying the APPHOST2 host name.
27. Verify that the installation was successful by viewing the instance in Oracle Enterprise Manager 10g. Start a browser and access the OC4J Admin instance at:

http://APPHOST2:8888/em

Note: The `ORACLE_HOME/install/readme.txt` file contains the URLs for the installation and a command to verify the status of processes.

5.2.2 Installing the Oracle HTTP Servers on WEBHOST1 and WEBHOST2

Follow these steps to install the Oracle HTTP Servers:

Use the Advanced option of the Oracle Universal Installer to install the Oracle HTTP Server instances. Follow these steps on WEBHOST1 and WEBHOST2 to install the Oracle HTTP Servers:

1. Ensure that the system, patch, kernel and other requirements are met as specified in the *Oracle Application Server Installation Guide*. You can find this guide in the Oracle Application Server platform documentation library for the platform and version you are using.
2. Copy the `staticports.ini` file from the `Disk1/stage/Response` directory to a local directory, such as TMP. You will provide the path to this file during installation.
3. Edit the `staticport.ini` file to assign the following custom ports:

```
Oracle HTTP Server port = 7777
```

Notes: Ensure that these ports are not already in use by any other service on the computer. Using the Static Ports feature to install the the Application Server Tier ensures that the port assignments will be consistent, if the ports are correctly specified in the file and the port is not already in use. If a port is incorrectly specified, the Oracle Universal Installer will assign the default port. If a port is already in use, the Oracle Universal Installer will select the next available port.

See [Section A.3, "Using the Static Ports Feature with Oracle Universal Installer"](#) on page A-2 for more information.

4. Start the Oracle Universal Installer as follows:

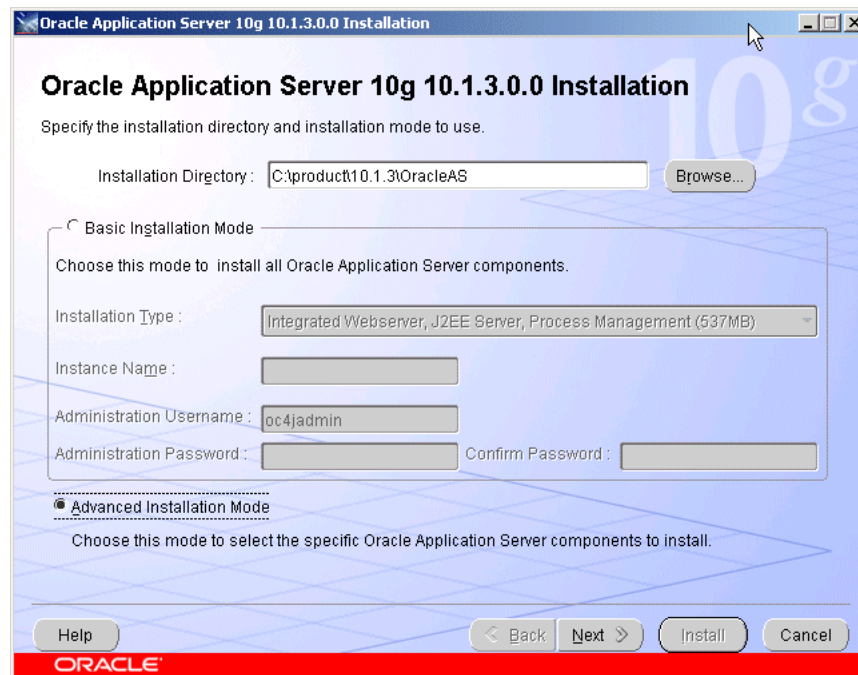
On UNIX, issue this command: **runInstaller**

On Windows, double-click **setup.exe**

The **Oracle Application Server 10.1.3.0.0 Installation** screen appears with the Basic Installation Mode and the Integrated Web Server, J2EE Web Server and Process Management installation type selected.

5. Specify an installation directory for the instance.
6. Select **Advanced Installation Mode**.

Figure 5–7 Oracle Universal Installer Oracle Application Server 10.1.3.0.0 Installation Screen with Advanced Installation Mode Selected

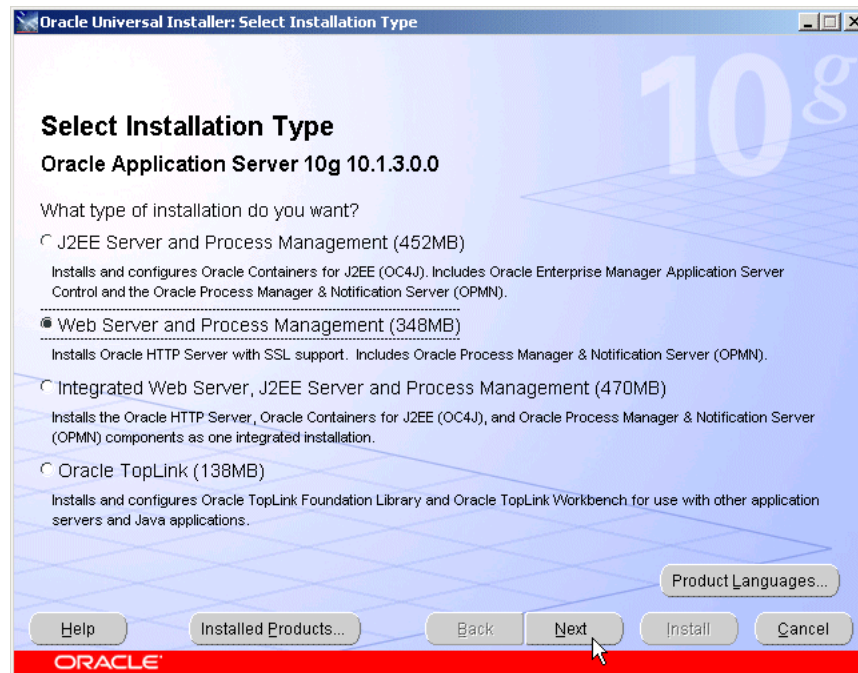


7. Click **Install**.

The **Select Installation Type** screen appears.

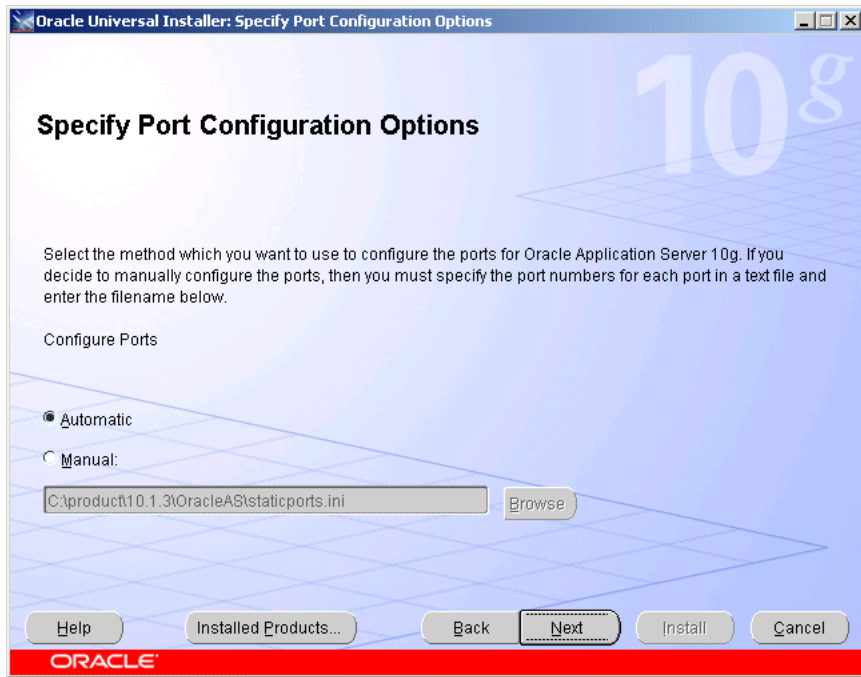
8. Select **Web Server and Process Management** and click **Next**.

Figure 5–8 Oracle Universal Installer Select Installation Type Screen



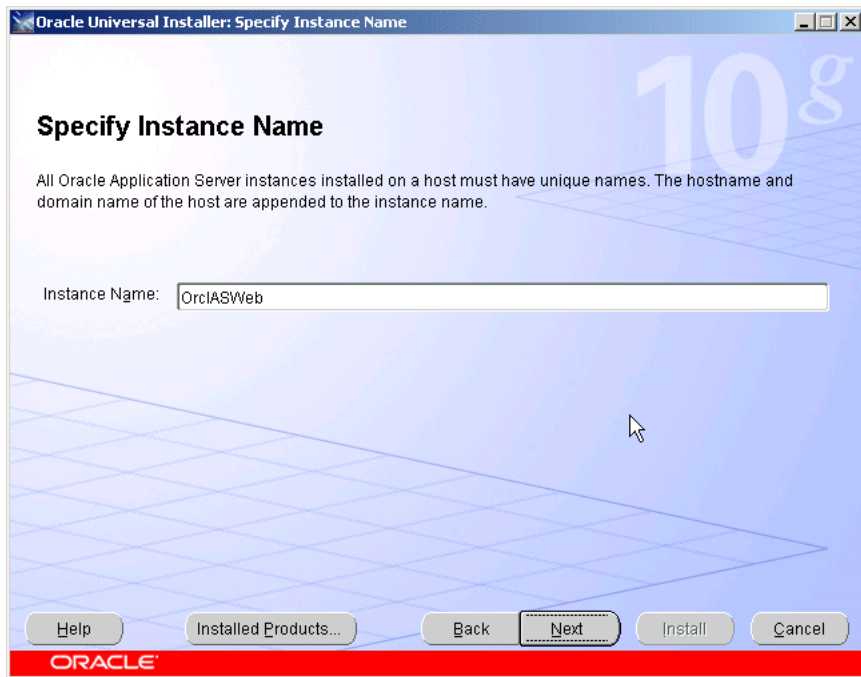
The **Specify Port Configuration Options** screen appears.

Figure 5–9 Oracle Universal Installer Specify Port Configuration Options Screen

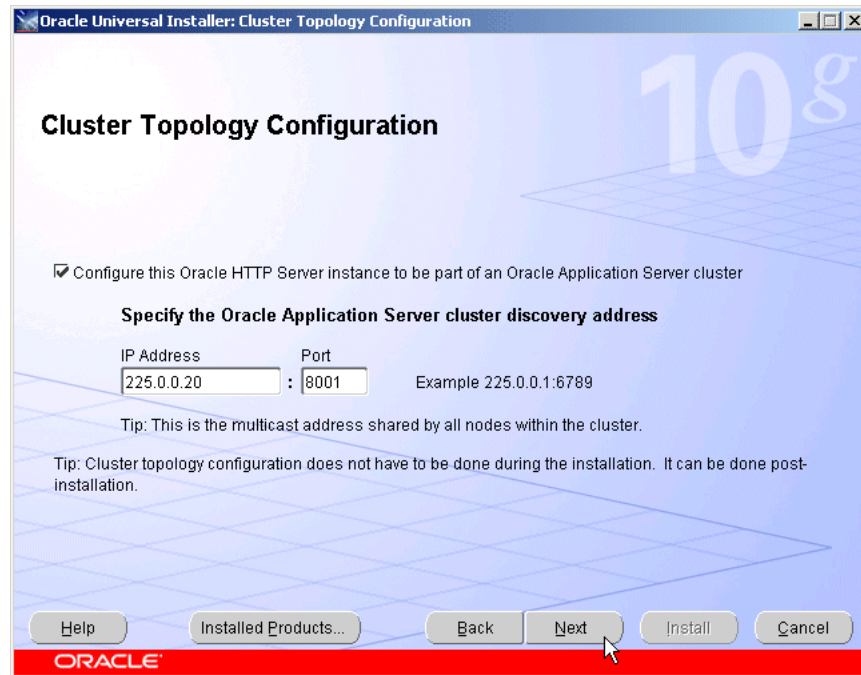


9. Select **Manual**, specify the location of the `staticports.ini` file, and click **Next**.
The **Specify Instance Name** screen appears.

Figure 5–10 Oracle Universal Installer Administration and Management Settings Screen



10. Specify the instance name and click **Next**.
The **Cluster Topology Configuration** screen appears.

Figure 5–11 Oracle Universal Installer Cluster Topology Configuration Screen

11. Check the box to configure the instance to be part of an Oracle Application Server cluster.
12. Specify the multicast address and port and click **Next**.
The **Summary** screen appears.
13. Click **Install**.
14. The **Configuration Assistants** screen appears. When the configuration process completes, the **End of Installation** screen appears.
15. Click **Exit**, and then confirm your choice to exit.
16. Verify that the installation was successful by viewing the Oracle HTTP Server instance. Start a browser and access:

`http://hostname:7777`

Note: The `ORACLE_HOME/install/readme.txt` file contains the URLs for the installation and a command to verify the status of processes.

17. Repeat the preceding steps to install and verify successful installation of the second instance on WEBHOST2.

5.2.3 Deploying J2EE Applications

Follow the steps in this section to deploy applications. You can perform this step before or after configuring clusters.

Deploying Applications with the Oracle Enterprise Manager 10g Application Server Control Console

You can use Application Server Control Console to deploy applications. Follow these steps:

1. Access the Application Server Control Console at:
`http://APPHOST1.us.oracle.com:8888/em`
The **Login** page appears.
2. Provide the password that was set during installation and click **Login**.
The **OC4J:home** page appears.
3. Click the **Cluster Topology** link.
The Cluster Topology page appears.
4. Identify in the **Members** list the OC4J instance in which you will deploy applications. Ensure that a green upward arrow appears in its Status column, indicating that it is running.

Note: You can deploy an application into multiple instances that belong to the same group. Instances in a group have the same name and password. For instructions on creating a group, see the *Oracle Application Server Administrator's Guide*, Section 2.3.6, "Using Application Server Control to Create and Manage Groups".

If a group exists, you can scroll down to the Groups section to see the list of instances in the group. To deploy to the group, click the Group name and continue with Step 8.

5. If necessary, start the OC4J instance by clicking the **Select** checkbox at the beginning of the row and then clicking the **Start** button preceding the **Members** list.

The **Processing: Starting** screen appears with this message:

The selected topology members are being started.

The Cluster Topology screen appears with a message that the topology member was started.

6. Click the link for the OC4J instance for application deployment.

The OC4J screen for the instance appears.

7. Click the **Applications** link.

The Applications page for the instance appears.

8. Click **Deploy**.

The Deploy: Select Archive screen appears.

9. Provide the location of the archive and click **Next**.

The Deploy: Application Attributes screen appears.

Provide the application name and click **Next**.

The Deploy: Deployment Settings screen appears.

10. (Optional) Perform deployment tasks or deployment plan editing, or save the current settings as a deployment plan.

11. Click **Deploy**.

The Processing: Deploy screen appears with progress messages.

Deploying Applications on the Command Line

To deploy applications into OC4J instances using the command line, follow these steps:

1. Issue this command in `APPHOST1_ORACLE_HOME\jdk\bin\java` (the parameters are shown on separate lines for readability only):

```
java -jar admin_client.jar uri admin ID admin password
-deploy -file full_path -deploymentName app_name
[-bindAllWebApps [Web site name]]
[-targetPath full_path] [-parent app_name]
[-deploymentDirectory full_path]
[-iiopClientJar full_path]
```

Note: Ideally, you should include the `-bindAllWebApps` subswitch to bind all Web modules within the EAR to the Web site through which they will be accessed. If no Web site is specified, modules will be bound to the default Web site.

The EAR file is deployed to the `ORACLE_HOME/j2ee/instance name/applications/` directory by default. The deployed EAR file is also copied to this directory. Each successive deployment will cause this EAR file to be overwritten.

5.2.4 Configuring the Cluster Gateway

Because there is a firewall between the Web Server and Process management instances clustered on the Web tier and the J2EE Server and Process Management instances clustered on the Application tier, you must configure a cross-topology gateway to enable communication between the clusters. In the gateway configuration, one server on each side of the firewall is an entry point into the cluster. These instructions designate APPHOST1 and WEBHOST1 as the gateway servers, but any server may be designated the gateway server. The remote port is used for communication with the gateway server; it is designated in the `<gateway>` subelement in `opmn.xml` as shown in bold.

Follow these steps to specify gateway servers on the Application Tier and the Web Tier:

1. Open the `APPHOST1_ORACLE_HOME/opmn/conf/opmn.xml` file.
2. Create the `<gateway>` subelement as shown in the example:

```
<notification-server>
  <port local="6101" remote="6201" request="6004"/>
  <ssl enabled="true" wallet-file="$ORACLE_HOME\opmn\conf\ssl.wlt\default"/>
  <topology>
```

```

<discover list="*225.0.0.20:8001"/>
  <gateway
list="apphost1.mycompany.com:6200&apphost2.mycompany.com:6200&webhost1.mycompan
y.com:6200&webhost2.mycompany.com:6200"/>
  </topology>
</notification-server>
...

```

Note: 6201 is the OPMN remote port on APPHOST1, and 6202 is the OPMN remote port on WEBHOST1. You must view the `opmn.xml` file on each server to determine the port values needed for the configuration.

3. Issue this command in `APPHOST1_ORACLE_HOME/opmn/bin`:

```
opmnctl reload
```

4. Copy the `<gateway>` subelement to the `WEBHOST1_ORACLE_HOME/opmn/conf/opmn.xml` file.
5. Issue this command in `WEBHOST1_ORACLE_HOME/opmn/bin`:

```
opmnctl reload
```

Note: For more information, see "Configuring Cross-Topology Gateways" in Chapter 8 of the *Oracle Containers for J2EE Configuration and Administration Guide*.

5.2.5 Configuring the Firewall for the Application Tier

After you have installed all of the components on the Application Tier, you will be able to identify the port numbers that need to be opened on the firewall. This depends on the number of application server instances and types of components installed. In general, the process of configuring the firewall involves these steps:

1. For each installed instance, determine the component types and their designated port ranges (for example, the OC4J home instance and any instances you create) by examining the `opmn.xml` file. [Example 5-1](#) shows components and default ports in the `opmn.xml` file. In the example, the OC4J Admin instance is listening on port 8888. Another instance, `Apps`, occupies port 12501.
2. Determine the ports in use with the `netstat` command:

```
netstat -an
```
3. Configure the firewall to open only the ports in use.

Example 5-1 Oracle Application Server components and port ranges in `opmn.xml`

```

<opmn xmlns="http://www.oracle.com/ias-instance">
  <log path="$ORACLE_HOME\opmn\logs\opmn.log" comp="internal;ons;pm"
rotation-size="1500000" />
  <debug path="$ORACLE_HOME\opmn\logs\opmn.dbg" comp="internal"
rotation-size="1500000" />
  <notification-server>
    <port local="6100" remote="6200" request="6003" />
    <ssl enabled="true" wallet-file="$ORACLE_HOME\opmn\conf\ssl.wlt\default" />
  </topology>

```

```

<discover list="*225.0.0.20:8001" />
</topology>
</notification-server>
...
<ias-component id="OC4J">
  <process-type id="Admin" module-id="OC4J" status="enabled">
    ...
    <port id="default-web-site" range="8888" protocol="http"/>
    ...
  </process-type>
  <process-type id="Apps" module-id="OC4J" status="enabled">
    ...
    <port id="default-web-site" range="12501" protocol="ajp"/>
    ...
  </process-type>
</ias-component>
...

```

Note that the AJP ports used by applications fall within the range 12501-12600. Ensure that all of the AJP ports used by OC4J applications are open on the firewall between the Web server and the application. If a port is not open, the following error occurs when access to the application from the Web tier is attempted (that is, when the URL **web host:port/application** is requested):

```

mod_oc4j: request to OC4J apphost1.us.oracle.com:12501 failed:
Connect failed (errno=110)

```

This error creates an entry in a log file in the `Apache/Apache/logs` directory.

5.3 Configuring the Oracle HTTP Server with the Load Balancing Router

The Load Balancing Router (`myapp.mycompany.com` (shown in [Figure 2-1](#), "Enterprise Deployment Architecture for myJ2EEcompany.com") must be configured to receive client requests and balance them to the two Oracle HTTP Server instances on the Web tier. See the load balancing router documentation for instructions on configuring the load balancer, and follow the instructions in this section configure the Oracle HTTP Server.

Incoming requests must be associated with the Load Balancing Router hostname and port in the myJ2EECompany configuration. To configure this, perform these steps on WEBHOST1 and WEBHOST2:

1. Open the Oracle HTTP Server configuration file:

```
ORACLE_HOME/Apache/Apache/conf/httpd.conf
```

2. Perform the following steps:

- a. Add the `LoadModule certheaders_module` directive for the appropriate platform.

UNIX Apache 1.3:

```
LoadModule certheaders_module libexec/mod_certheaders.so
```

UNIX Apache 2.0; use this directive if you plan to use Apache 2.0 on UNIX:

```
LoadModule certheaders_module modules/mod_certheaders.so
```

Windows:

```
LoadModule certheaders_module modules/ApacheModuleCertHeaders.dll
```

- b. Add the lines shown under the Apache version you are using to create a `NameVirtualHost` directive and a `VirtualHost` container for `myapp.mycompany.com` and port 443.

Apache 1.3:

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

Apache 2.0 (UNIX):

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

Notes: The `LoadModule` directives (in particular, the `LoadModule rewrite_module` directive) must appear in the `httpd.conf` file at a location preceding the `VirtualHost` directives. The server must load all modules before it can execute the directives in the `VirtualHost` container.

It is a good idea to create the `VirtualHost` directives at the end of the `httpd.conf` file.

The `LoadModule rewrite_module` directive must appear before the `LoadModule certheaders_module` directive.

3. Save the `httpd.conf` file.
4. Restart the components using these commands in `ORACLE_HOME/opmn/bin`:


```
opmnctl stopall
opmnctl startall
```


5.4 Configuring Application Authentication and Authorization

The Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider (also referred to as JAZN) LDAP-based provider is used for authentication and authorization to the OC4J applications.

In the myJ2EECompany configuration, this provider is used without Oracle Application Server Single Sign-On. This section explains how to configure the Oracle Application Server instances on the application tier to use the JAZN LDAP provider. For instructions on how to use Oracle Enterprise Manager 10g to manage the data in this provider, see Chapter 8 in the *Oracle Containers for J2EE Security Guide*.

5.4.1 Using the Oracle Application Server Java Authentication and Authorization Service (JAAS) Provider

You will need to follow the steps in this section on both Oracle Application Server instances (APPHOST1 and APPHOST2) that will use the JAZN LDAP provider. Ensure that you specify the same Oracle Internet Directory computer for APPHOST1 and APPHOST2—that is, the load balancing router for OIDHOST1 and OIDHOST2.

Before you begin the steps in this section, ensure that the middle tier instance is stopped and the Oracle Internet Directory instance is running. Start the Oracle Enterprise Manager 10g Application Server Control Console, if necessary, and perform these steps:

1. On the **OC4J:home** page, click the **Administration** link.
The **Administration Tasks** list appears.
2. In the **Security** section, click the **Go To Task** icon for **Identity Management**.
The **Identity Management:** page appears.
3. Click **Configure** if no host is configured, or click **Change** if you want to change the configured host.
The **Configure Identity Management: Connect Information** screen appears.
4. In the **Oracle Internet Directory Host** field, enter the host name of the Load Balancing Router (for example, `oid.mycompany.com`, in [Figure 2-1](#)).
5. In the **Oracle Internet Directory User DN** field, enter the Distinguished Name of the user that can log in to Oracle Internet Directory (the user must be in the IASAdmins group).
6. In the Password field, enter the Oracle Internet Directory user's password.
7. Select the checkbox to use the non-SSL connection to Oracle Internet Directory. In the **Port** field, enter 389 .
8. Click **Next**.
The **Configure Identity Management: Application Server Control** page appears.
9. Select **Use Oracle Identity Management Security Provider**.
10. Click **Next**.
The **Configure Identity Management: Deployed Applications** page appears.
11. Select the applications deployed to the OC4J instance that you want to use the Oracle Identity Management Security Provider.
12. Click **Configure**.

A message appears notifying you that the configuration was successful, and notifies you that you must restart the OC4J instance.

13. Click Restart.

The instance is restarted, and the configuration is complete.

5.4.2 Adding Administrative Users and Groups to Oracle Internet Directory for the OracleAS JAAS Provider

To use the OracleAS JAAS Provider, you must populate Oracle Internet Directory with certain user entries. In 10g Release 3 (10.1.3), the accounts and groups are managed by Mbeans. You may still need to map or create an anonymous user account. See "Summary of OC4J Accounts" in the *Oracle Containers for J2EE Security Guide*.

Sample Files and Values

This appendix contains sample files and recommended values you will use throughout the Enterprise Deployment configuration. It contains these sections:

[Section A.1, "Metadata Repository Tablespaces" on page A-1](#)

[Section A.2, "Tablespace Mapping to Raw Devices Sample File" on page A-2](#)

[Section A.3, "Using the Static Ports Feature with Oracle Universal Installer" on page A-2](#)

A.1 Metadata Repository Tablespaces

Tablespaces for raw devices in the Metadata Repository are listed in [Table A-1](#), with minimum sizes and recommended names.

Table A-1 Raw Devices for the OracleAS Metadata Repository

Tablespace	Minimum Size (MB)	Recommended Name
PORTAL	128	<i>dbname_raw_portal_128m</i>
PORTAL_DOC	64	<i>dbname_raw_portaldoc_64m</i>
PORTAL_IDX	64	<i>dbname_raw_portalidx_64m</i>
PORTAL_LOG	64	<i>dbname_raw_portallog_64m</i>
DCM	256	<i>dbname_raw_dcm_256m</i>
OCATS	64	<i>dbname_raw_ocats_64m</i>
DISCO_PTM5_CACHE	64	<i>dbname_raw_discoptm5cache_64m</i>
DISCO_PTM5_META	64	<i>dbname_raw_discoptm5meta_64m</i>
WCRSYS_TS	64	<i>dbname_raw_wcrsys_64m</i>
UDDISYS_TS	64	<i>dbname_raw_uddisys_64m</i>
OLTS_ATTRSTORE	128	<i>dbname_raw_oltsattrstore_128m</i>
OLTS_BTTRSTORE	64	<i>dbname_raw_oltsbttrstore_128m</i>
OLTS_CT_STORE	256	<i>dbname_raw_oltsctstore_256m</i>
OLTS_DEFAULT	128	<i>dbname_raw_oltsdefault_128m</i>
OLTS_SVRMGSTORE	64	<i>dbname_raw_oltssvrmgstore_64m</i>
IAS_META	256	<i>dbname_raw_iasmeta1_128m</i>
DSGATEWAY_TAB	64	<i>dbname_raw_dsgatewaytab_64m</i>

A.2 Tablespace Mapping to Raw Devices Sample File

Example A–1 shows the format of the file you use to map tablespaces to raw devices. The `DBCA_RAW_CONFIG` environment variable reads this file during tablespace creation.

Example A–1 Tablespace to Raw Device Mapping (Sample File)

```
PORTAL1=/dev/vx/rdisk/oracle/mydb_raw_portal_128m
PORTAL_DOC1=/dev/vx/rdisk/oracle/mydb_raw_portal_doc_64m
PORTAL_IDX1=/dev/vx/rdisk/oracle/mydb_raw_portal_idx_64m
PORTAL_LOG1=/dev/vx/rdisk/oracle/mydb_raw_portal_log_64m
IAS_META1=/dev/vx/rdisk/oracle/mydb_raw_ias_meta_256m
DISCO_PTM5_META1=/dev/vx/rdisk/oracle/mydb_raw_disco_meta_64m
DISCO_PTM5_CACHE1=/dev/vx/rdisk/oracle/mydb_raw_disco_cache_64m
DCM1=/dev/vx/rdisk/oracle/mydb_raw_dcm_256m
WCRSYS_TS1=/dev/vx/rdisk/oracle/mydb_raw_clip_64m
OCATS1=/dev/vx/rdisk/oracle/mydb_raw_oca_64m
UDDISYS_TS1=/dev/vx/rdisk/oracle/mydb_raw_uddi_64m
OLTS_ATTRSTORE1=/dev/vx/rdisk/oracle/mydb_raw_olts_attr_128m
OLTS_BATTRSTORE1=/dev/vx/rdisk/oracle/mydb_raw_olts_battr_64m
OLTS_CT_STORE1=/dev/vx/rdisk/oracle/mydb_raw_olts_ct_store_256m
OLTS_DEFAULT1=/dev/vx/rdisk/oracle/mydb_raw_olts_default_128m
OLTS_SVRMGSTORE1=/dev/vx/rdisk/oracle/mydb_raw_olts_svrmgstore_64m
DSGATEWAY_TAB1=/dev/vx/rdisk/oracle/mydb_raw_synd_64m
b2b_dt1=/dev/vx/rdisk/oracle/mydb_raw_b2b_dt_256m
b2b_rt1=/dev/vx/rdisk/oracle/mydb_raw_b2b_rt_256m
b2b_lob1=/dev/vx/rdisk/oracle/mydb_raw_b2b_lob_256m
b2b_idx1=/dev/vx/rdisk/oracle/mydb_raw_b2b_idx_256m
```

A.3 Using the Static Ports Feature with Oracle Universal Installer

The Static Ports feature enables you to assign ports during installation. The Oracle Universal Installer reads the `staticports.ini` file, assigning the port values to Oracle Application Server components as specified.

A sample `staticports.ini` file, shown in **Example A–2**, is provided on:

Disk 1: `mount_point/1012disk1/stage/Response/staticports.ini`

Example A–2 Sample staticports.ini File

```
# staticports.ini Template File

# This file is a template for specifying port numbers at installation time.
# To specify a port number, uncomment the appropriate line (remove #) and
# replace "port_num" with the desired port number.
# You can then launch Oracle Universal Installer with special options to use this
file.
# Please refer to Oracle Application Server 10g Installation Guide for
instructions.

#Oracle HTTP Server port = port_num
#Oracle HTTP Server SSL port = port_num
#Oracle Notification Server Request port = port_num
#Oracle Notification Server Local port = port_num
#Oracle Notification Server Remote port = port_num
```

To use the file:

1. Copy the file from Disk 1 to the `ORACLE_HOME` or `TMP` directory.

2. Edit the file to include the port numbers you want to assign during installation.
3. Provide the path to the file to Oracle Universal Installer during installation.

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