Oracle® Database

Installation Guide

11*g* Release 2 (11.2) for Microsoft Windows

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ORACLE®

Oracle Database Installation Guide 11*g* Release 2 (11.2) for Microsoft Windows

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Preface

This guide explains how to install and configure Oracle Database for Microsoft Windows (32-bit) and Microsoft Windows x64. This guide also provides information about Optimal Flexible Architecture, cloning an Oracle home, troubleshooting installation issues, and the process to remove the database software.

> **See Also:** "Oracle Database Software Requirements" for information about supported operating systems

This preface contains these topics:

- Audience
- Documentation Accessibility
- Accessing Documentation
- Related Documentation
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Audience

Oracle Database Installation Guide for Microsoft Windows is intended for anyone installing Oracle Database on a single computer. Additional installation guides for Oracle Real Application Clusters, Oracle Grid Infrastructure, Oracle Database Examples, and Oracle Enterprise Manager Grid Control are available on Oracle Technology Network at:

http://www.oracle.com/technetwork/indexes/documentation/index.html

To use this document, you need the following:

- A supported Microsoft Windows operating system installed and tested on your computer system
- Administrative privileges on the computer where you are installing the Oracle Database software
- Familiarity with object-relational database management concepts

> **See Also:**
>
> - *Oracle Database Quick Installation Guide for Microsoft Windows (32-Bit)* to install Oracle Database using the default settings
> - *Oracle Database Quick Installation Guide for Microsoft Windows x64* to install Oracle Database using the default settings

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit
http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

Accessing Documentation

The documentation for this release includes platform-specific documentation and generic product documentation.

Platform-Specific Documentation

Platform-specific documentation includes information about installing and using Oracle products on particular platforms.

The platform-specific documentation for this product is available in both Adobe portable document format (PDF) and HTML format on Oracle Technology Network at:

http://www.oracle.com/technetwork/indexes/documentation/index.html

Product Documentation

Product documentation includes information about configuring, using, or administering Oracle products on any platform. The product documentation for Oracle Database 11*g* Release 2 (11.2) is available in both HTML and PDF formats on Oracle Technology Network (OTN) at:

http://www.oracle.com/technetwork/indexes/documentation/index.html

Related Documentation

For more information, see these Oracle resources:

- *Oracle Database Concepts*
- *Oracle Database New Features Guide*
- *Oracle Database Licensing Information*
- *Oracle Database Readme*
- *Oracle Database Release Notes for Microsoft Windows*
- *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX*
- *Oracle Database Client Installation Guide for Microsoft Windows*
- *Oracle Database Examples Installation Guide*
- *Oracle Real Application Clusters Installation Guide*
- *Oracle Grid Infrastructure Installation Guide*
- *Oracle Automatic Storage Management Administrator's Guide*
- *Oracle Enterprise Manager Grid Control Basic Installation Guide*

- *Oracle Database Platform Guide for Microsoft Windows*
- *Oracle Database Upgrade Guide*
- *Oracle Database 2 Day DBA*

For information about Oracle error messages, see *Oracle Database Error Messages*. Oracle error message documentation is available only in HTML. If you only have access to the Oracle Database 11*g* Release 2 (11.2) Online Documentation Library, you can browse the error messages by range. Once you find the specific range, use your browser's "find in page" feature to locate the specific message. When connected to the Internet, you can search for a specific error message using the error message search feature of the Oracle online documentation.

Many books in the documentation set use the sample schemas of the seed database, which is installed by default when you install Oracle. For information about how these schemas were created and how you can use them yourself, see *Oracle Database Sample Schemas.*

To download free release notes, installation documentation, white papers, or other collateral, visit the Oracle Technology Network. You must register online before using Oracle Technology Network; registration is free and can be done at

http://www.oracle.com/technetwork/community/join/overview/index.html

If you already have a user name and password for Oracle Technology Network, then you can go directly to the documentation section of the Oracle Technology Network Web site at

http://www.oracle.com/technetwork/indexes/documentation/index.html

Conventions

The following text conventions are used in this document:

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

What's New in Oracle Database 11*g* Release 2 (11.2)

This section describes new features that are documented in this guide and provides pointers to additional information.

- Oracle Database 11g Release 3 (11.2.0.3) Enhancements

- Oracle Database 11g Release 2 (11.2.0.2) New Features

- Oracle Database 11g Release 2 (11.2.0.1) New Features

- Deprecated in Oracle Database 11g Release 2 (11.2)

- Desupported in Oracle Database 11g Release 2 (11.2)

Oracle Database 11g Release 3 (11.2.0.3) Enhancements

Starting with Oracle Database 11*g* Release 2 (11.2.0.3) you can enter the Proxy Realm information while providing details for downloading software updates. The proxy realm identifies the security database used for authentication. If you do not have a proxy realm, then you do not need to provide an entry for the Proxy Username, Proxy Password, and Proxy Realm fields. It is case-sensitive.

This proxy realm is for software updates download only.

Oracle Database 11*g* Release 2 (11.2.0.2) New Features

The following new features or enhancements are provided with Oracle Database 11*g* Release 2 (11.2.0.2):

- Enhanced Patch Set Installation

- New Software Updates Option

- In-Place Upgrade of Oracle Database Client

Enhanced Patch Set Installation

Starting with the release of the 11.2.0.2 patch set for Oracle Database 11*g* Release 2, Oracle Database patch sets are full installations of the Oracle Database software. Note the following changes with the new patch set packaging:

- Direct upgrades from previous releases (11.x, 10.x) to the most recent patch set are supported.

- Out-of-place patch set upgrades, in which you install the patch set into a new, separate Oracle home, are the best practices recommendation. In-place upgrades are supported, but not recommended.

- New installations consist of installing the most recent patch set, rather than installing a base release and then upgrading to a patch release.

> **See Also:** My Oracle Support Note 1189783.1, "Important Changes to Oracle Database Patch Sets Starting With 11.2.0.2", available from the following URL:
>
> https://support.oracle.com/CSP/main/article?cmd=show&type=NO T&doctype=ANNOUNCEMENT&id=1189783.1

New Software Updates Option

New functionality for software updates is available starting with Oracle Database 11*g* Release 2 (11.2.0.2). Use the Software Updates feature to dynamically download and apply software updates as part of the Oracle Database installation. You can also download the updates separately using the `-downloadUpdates` option and later apply them during the installation by providing the location where the updates are present.

> **See Also:** "Software Updates Option" on page 1-10

In-Place Upgrade of Oracle Database Client

This functionality is available starting with Oracle Database 11*g* Release 2 (11.2.0.2). Use the In-Place Upgrade feature of Oracle Database Client to upgrade an existing Oracle Database Client 11*g* Release 2 (11.2) version with the latest Oracle Database Client version.

> **See Also:** *Oracle Database Client Installation Guide for Microsoft Windows* for more information about In-Place Upgrade

Oracle Database 11*g* Release 2 (11.2.0.1) New Features

The following new features or enhancements are provided with Oracle Database 11*g* Release 2 (11.2.0.1):

- New Oracle Grid Infrastructure Installation Option
- New Desktop and Server Class Options
- Daylight Saving Time Upgrade of Timestamps with Timezone Data Type
- SYSASM Privilege
- New Tool to Configure Custom Installation Options
- Deinstallation Tool
- Intelligent Data Placement
- Oracle Automatic Storage Management Cluster File System
- Data Pump Export and Data Pump Import
- Use Oracle Restart to Automatically Restart Your Database
- SRVCTL Support for a Single-Instance Database in a Cluster

New Oracle Grid Infrastructure Installation Option

Oracle Database 11*g* Release 2 introduces the Oracle Grid Infrastructure installation. For single-instance databases, Oracle Grid Infrastructure includes Oracle Automatic Storage Management (Oracle ASM), the listener, and Oracle Restart. Oracle Restart is a new feature that provides the ability to monitor, manage, and automatically restart on failure of the Oracle Database environment including the Oracle Database instance, Oracle Automatic Storage Management instance, and listeners. In a clustered environment, Oracle Grid Infrastructure includes Oracle Clusterware, Oracle ASM, and the listener.

Oracle Grid Infrastructure is only available on 64-bit Windows.

To use Oracle Grid Infrastructure for a standalone server, you must install the Oracle software from the Oracle Grid Infrastructure media before you install the database.

> **See Also:** Chapter 3, "Oracle Grid Infrastructure for a Standalone Server"

New Desktop and Server Class Options

Oracle Database 11*g* Release 2 introduces a new option that enables you to specify the type of system on which the database is installed. If you are installing on a laptop or a desktop, then select the Desktop Class option; otherwise, select the Server Class option to install on a server. These options are available on the System Class screen.

There is no difference in the software that is installed after you select any one option but the Desktop Class option installs a single-instance database without the advanced configuration options.

> **See Also:** "Interactive Installation Types" on page 1-9 for more information about the desktop and server class options

Daylight Saving Time Upgrade of Timestamps with Timezone Data Type

When time zone version files are updated due to daylight saving time changes, TIMESTAMP WITH TIMEZONE (TSTZ) data could become stale. In previous releases, database administrators ran the SQL script `utltzuv2.sql` to detect TSTZ data affected by the time zone version changes and then performed extensive manual procedures to update the TSTZ data.

With this release, TSTZ data is updated transparently with very minimal manual procedures using newly provided DBMS_DST PL/SQL packages. In addition, there is no longer a need for clients to patch their time zone data files.

> **See Also:**
>
> - *Oracle Database Upgrade Guide* for information about preparing to upgrade Timestamp with Time Zone data
>
> - *Oracle Database Globalization Support Guide* for information about how to upgrade the Time Zone file and Timestamp with Time Zone data
>
> - *Oracle Call Interface Programmer's Guide* for information about performance effects of clients and servers operating with different versions of Time Zone files

SYSASM Privilege

Starting with 11*g* Release 2, Oracle ASM administration must be done with the `SYSASM` privilege. The `SYSASM` privilege also can be granted using password authentication on the Oracle ASM instance.

You can designate `OPERATOR` privileges (a subset of the `SYSASM` privileges, including starting and stopping Oracle ASM) to members of the `ORA_OPER` for Oracle ASM group.

Using the `SYSASM` privilege for Oracle ASM administration creates a clearer division of responsibility between Oracle ASM administration and database administration.

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for more information about the `SYSASM` privilege, `ASMSNMP` account, and `ORA_DBA` operating system group

New Tool to Configure Custom Installation Options

Oracle Universal Installer no longer provides the custom installation option of individual components. Use the `chopt` tool, a command-line utility that is located in the *ORACLE_HOME*\bin directory, to configure the database options.

> **See Also:** "Enabling and Disabling Database Options" on page 5-13

Deinstallation Tool

Use the new deinstallation tool (`deinstall`) available as an Oracle Technology Network download (before installation) and in the Oracle home directory (after installation) to remove Oracle Database software.

See "About the Deinstallation Tool" on page 7-1 for more detailed information

Intelligent Data Placement

The Intelligent Data Placement feature enables you to specify disk regions on Oracle ASM disks to ensure that frequently accessed data is placed on the outermost (hot) tracks which provide higher performance.

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for more information about Oracle ASM Intelligent Data Placement

Oracle Automatic Storage Management Cluster File System

Oracle Automatic Storage Management Cluster File System (Oracle ACFS) is a new multiplatform, scalable file system, and storage management design that extends Oracle ASM technology, to support data that cannot be stored in Oracle ASM, in both single instance and cluster configurations. Additionally, Oracle ACFS provides snapshot functionality for a point-in-time copy of an Oracle ACFS system.

The software required for Oracle Automatic Storage Management Cluster File System is installed with the Oracle Grid Infrastructure installation.

> **See Also:**
>
> - "Oracle ACFS and Oracle ADVM Support"
> - *Oracle Automatic Storage Management Administrator's Guide* for more information about Oracle ACFS

Data Pump Export and Data Pump Import

Data Pump provides a legacy mode in which you can use original Export and Import parameters when performing Data Pump Export and Import operations.

> **See Also:** *Oracle Database Utilities* for more information about Data Pump legacy mode

Use Oracle Restart to Automatically Restart Your Database

Oracle Restart is a new feature included in this release to enhance the availability of Oracle databases in a single-instance environment. If you install Oracle Restart and there is a temporary failure of any part of the Oracle Database software stack, including the database, listener, and Oracle ASM instance, Oracle Restart automatically restarts the failed component. In addition, Oracle Restart starts all these components when the database host computer is restarted. The components are started in the proper order, taking into consideration the dependencies among components.

> **See Also:** Chapter 4, "Configuring Automatic Restart of an Oracle Database" in the *Oracle Database Administrator's Guide* for more information about Oracle Restart

New Method of Installing Oracle Automatic Storage Management

In past releases, Oracle ASM was installed as part of the Oracle Database installation. With Oracle Database 11*g* Release 2 (11.2), Oracle ASM is installed when you install the Oracle Grid Infrastructure components and shares an Oracle home with Oracle Clusterware when installed in a cluster such as with Oracle Real Application Clusters or with Oracle Restart on a single-instance database.

To upgrade an existing Oracle ASM, you must upgrade Oracle ASM by running an Oracle Grid Infrastructure upgrade. If Oracle ASM is not installed and you want to use Oracle ASM as your storage option, then you must complete an Oracle Grid Infrastructure installation before you start Oracle Database installation.

> **See Also:** "Oracle Grid Infrastructure" for more information about installing the Oracle Grid Infrastructure software

SRVCTL Support for a Single-Instance Database in a Cluster

SRVCTL has been enhanced to support single-instance databases with Oracle Restart on standalone servers and on clusters with Oracle Clusterware. SRVCTL is a command-line interface used to manage Oracle Database processes (database instance, listener, Oracle ASM instance) when using Oracle Restart. With SRVCTL, you can manage the Oracle Restart configuration, see the status of processes managed by Oracle Restart, and start or stop processes such as Oracle Database.

> **See Also:** Chapter 4, "Configuring Automatic Restart of an Oracle Database" in the *Oracle Database Administrator's Guide* for more information about SRVCTL commands

Deprecated in Oracle Database 11*g* Release 2 (11.2)

The following are not supported or available with Oracle Database 11*g* Release 2:

- Installing data files directly on raw devices is no longer available during installation with Oracle Universal Installer or Database Configuration Assistant. You must use a file system or Oracle ASM.

- Custom installation option

- Windows Server 2000

- Oracle Ultra Search

Desupported in Oracle Database 11g Release 2 (11.2)

The following feature is no longer supported with Oracle Database 11g Release 2 (11.2):

The `-cleanupOBase` flag of the deinstallation tool is desupported. There is no replacement for this flag.

1

Overview of Oracle Database Installation

This chapter describes the different installation types of Oracle Database and issues to consider before you install Oracle Database:

- New Oracle Products and Features Installed with This Release
- Planning Your Installation
- Installation Considerations
- Migration Considerations
- Oracle Database Installation Methods
- Software Updates Option
- Oracle Database Editions
- Database Configuration Options
- Database Storage Options
- Database Management Options
- Database Backup and Recovery Options
- Email Notification Options
- Upgrade Considerations

1.1 New Oracle Products and Features Installed with This Release

There are many new features and products installed with this release. See the What's New in Oracle Database 11g Release 2 (11.2) chapter.

1.2 Planning Your Installation

The Oracle Database installation process consists of six steps:

1. **Read the release notes**: Read the Oracle Database release notes before you begin the installation. The release notes are available with the platform-specific documentation. The latest version of the release notes is available on Oracle Technology Network at

   http://www.oracle.com/technetwork/indexes/documentation/index.html

2. **Review the licensing information:** Although the installation media in your media pack contain many Oracle components, you are permitted to use only those components for which you have purchased licenses.

Oracle Support Services does not provide support for components for which licenses have not been purchased.

> **See Also:** *Oracle Database Licensing Information*

3. **Plan the installation**: This overview chapter describes the Oracle products that you can install and issues that you must consider before starting the installation.

    You also may want to see Appendix G, which covers frequently asked questions about installing Oracle Database components, such as how to install Oracle Database if your site uses Oracle applications or if you need multiple Oracle Database client connections.

    If you plan to perform multiple installations, see Appendix C for information about silent or response file installations, and cloning the Oracle home.

    Oracle Database Client is installed separately. You cannot install Oracle Database Client during an Oracle Database installation.

4. **Complete preinstallation tasks**: Chapter 2 describes tasks that you must complete before installing Oracle Database. Additionally, see Chapter 3 for Oracle Restart preinstallation tasks.

5. **Install the software**: Use the following sections to install Oracle Database:

   - Chapter 4 describes how to use Oracle Universal Installer to install Oracle Database and how to clone an Oracle home.

   - Chapter 3 describes how to use Oracle Universal Installer to install Oracle Grid Infrastructure for a standalone server and Oracle Automatic Storage Management from the Oracle Grid Infrastructure media.

   - Chapter 7 describes how to remove Oracle Database software.

   - Appendix C describes how to perform silent or response file installations, which you may want to use to perform multiple installations of Oracle Database.

   - Appendix D describes how to install and use Oracle components in different languages.

   - Appendix F provides troubleshooting advice in case you encounter problems with the installation.

6. **Complete postinstallation tasks**: Chapter 5 describes postinstallation tasks.

7. **Get started using Oracle Database**: Use the following sections to get started using Oracle Database:

   - Chapter 6 describes how to check the contents of the installed Oracle Database, how to start the database and various other Oracle tools, and how to locate various files.

   - "Cloning an Oracle Home" on page 4-19 describes how you can clone an existing Oracle Database home.

   - Appendix B on the Optimal Flexible Architecture, which is a set of guidelines that ensure reliable Oracle installations that require little maintenance.

   - Appendix D describes globalization support information.

   - Appendix E explains how to manage Oracle Database port numbers.

1.3 Installation Considerations

This section contains information that you should consider before deciding how to install this product. It contains the following sections:

- Installation Differences Between Windows and UNIX Systems
- Recommended File System
- Managing User Accounts with User Account Control
- Hardware and Software Certification
- Multiple Oracle Homes Support
- Oracle Grid Infrastructure for a Standalone Server
- Oracle Cluster Synchronization Services
- Oracle Universal Installer Overview
- Oracle Base Directory
- Oracle Home Directory
- Installing Oracle Database Vault in an Oracle Data Guard Environment
- Oracle Database Vault Default Audit Policy and Initialization Parameters

1.3.1 Installation Differences Between Windows and UNIX Systems

If you are experienced with installing Oracle components in UNIX environments, note that many manual setup tasks required on UNIX are not required on Windows. The key differences between UNIX and Windows installations are:

- Startup and shutdown services

  With Windows, Oracle Universal Installer creates services at installation time that can be configured to automatically start the Oracle software components when the host computer starts. On Linux and UNIX systems, database or system administrators must manually configure the `oratab` file.

- Environment variables

  With Windows, Oracle Universal Installer sets environment variables such as *PATH*, *ORACLE_BASE*, *ORACLE_HOME*, and *ORACLE_SID* in the registry. In UNIX systems, you must manually set these environment variables.

  If you have multiple Oracle homes installed, then only the SID of the last Oracle home is set in the registry. See *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about managing Oracle homes.

- Operating System Groups

  On Windows systems, Oracle Universal Installer creates the `ORA_DBA`, `ORA_OPER`, `ORA_SID_DBA` and `ORA_SID_OPER` groups, which are used for operating system authentication for Oracle instances. On Linux and UNIX systems, you must create these operating system groups manually, and they are used for granting permission to access various Oracle software resources and for operating system authentication. Windows does not use an Oracle Inventory group.

- Account for running Oracle Universal Installer

  With Windows, you log in with Administrator privileges. You do not need a separate account. On Linux and UNIX systems, you must create and use a

software owner user account, and this user must belong to the Oracle Inventory group.

> **See Also:** "Oracle Database Windows/UNIX Differences" appendix in *Oracle Database Platform Guide for Microsoft Windows*

1.3.2 Recommended File System

Oracle strongly recommends that you install the Oracle database home (Oracle database binaries, trace files, and so on) on Oracle ACFS or NTFS; the database files themselves must be placed on Oracle ASM if using Oracle ACFS; otherwise they can be placed on NTFS. Usage of Oracle ACFS and Oracle ASM or NTFS instead of FAT32 is recommended to ensure security of these files.

> **See Also:** "File Permissions" in *Oracle Database Platform Guide for Microsoft Windows* for information about the default permissions when using Oracle Universal Installer and Database Configuration Assistant to install the Oracle Database software

1.3.3 Managing User Accounts with User Account Control

To ensure that only trusted applications run on your computer, Windows Vista, Windows Server 2008, Windows Server 2008 R2, Windows 7, Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2 provide User Account Control. If you have enabled this security feature, then, depending on how you have configured it, Oracle Universal Installer prompts you for either your consent or your credentials when installing Oracle Database. Provide either the consent or your Windows Administrator credentials as appropriate.

You must have Administrator privileges to run some Oracle tools, such as Database Configuration Assistant, Net Configuration Assistant, and OPatch, or to run any tool or application that writes to any directory within the Oracle home. If User Account Control is enabled, and you are logged in as the local Administrator, then you can successfully run each of these commands in the usual way. However, if you are logged in as "a member of the Administrator group," then you must explicitly invoke these tasks with Windows Administrator privileges. All the Oracle shortcuts that require Administrator privileges start as "Administrator" automatically when you click the shortcuts. However, if you run the above tools from a Windows command prompt, you must run them from an Administrator command prompt. OPatch does not have a shortcut and has to be run from an Administrator command prompt.

> **See Also:** "Running Tools with Windows User Account Control" in *Oracle Database Platform Guide for Microsoft Windows* for more information.

To start a command prompt window with Windows Administrator privileges:

1. On your desktop, create a shortcut for the command prompt window. An icon for that shortcut appears on the desktop.

2. Right-click the icon for the newly created shortcut, and specify **Run as administrator**.

When you open this window, the title bar reads Administrator: Command Prompt. Commands run from within this window are run with Administrator privileges.

1.3.4 Hardware and Software Certification

The platform-specific hardware and software requirements included in this installation guide were current at the time this guide was published. However, because new platforms and operating system software versions might be certified after this guide is published, review the certification matrix on the My Oracle Support (formerly Oracle*MetaLink*) Web site for the most up-to-date list of certified hardware platforms and operating system versions. This Web site also provides compatible client and database versions, patches, and workaround information for bugs. The My Oracle Support (formerly Oracle*MetaLink*) Web site is available at

https://support.oracle.com/

You must register online before using My Oracle Support. After logging in, from the menu options, select the **Certifications** tab. On the Certifications page, use the **Certification Search** options to search by **Product**, **Release**, and **Platform**. You can also search using the **Certification Quick Links** options such as **Product Delivery**, and **Lifetime Support**.

> **See Also:** "Windows Certification and Web Browser Support" on page 2-8

1.3.4.1 Third-Party Database Certification for Oracle SQL Developer

You can use Oracle SQL Developer to view metadata and data of several non-Oracle databases. See "Database Certification for SQL Developer (Oracle and Third-Party)" in *Oracle SQL Developer Installation Guide* for more information.

1.3.5 Multiple Oracle Homes Support

Oracle Database supports multiple Oracle homes. You can install this release or previous releases of the software more than once on the same system, in different Oracle home directories. This allows flexibility in deployment and maintenance of the database software. For example, it enables you to run different versions of the database simultaneously on the same system, or it enables you to upgrade specific database instances on a system without affecting other running databases. However, when you have installed multiple Oracle Homes on a single system, there is also some added complexity introduced that you must consider allowing these Oracle Homes to coexist.

> **See Also:** My Oracle Support (formerly Oracle*MetaLink*) Note 460054.1 for more details about multiple Oracle home environment issues

1.3.5.1 Installing Oracle Database on a System with Existing Oracle Software

You must install this product into a new Oracle home directory. You cannot install products from one release of Oracle Database into an Oracle home directory of a different release. For example, you cannot install Oracle Database 11g Release 2 (11.2) software into an existing Oracle9*i* Oracle home directory.

You can install this release more than once on the same system if each installation is installed in a separate Oracle home directory.

1.3.6 Oracle Grid Infrastructure for a Standalone Server

The Oracle Grid Infrastructure for a standalone server provides the infrastructure to include your single instance database in an enterprise grid architecture. Oracle

Database 11*g* Release 2 (11.2) combines these infrastructure products into one software installation called the Oracle Grid Infrastructure home. On a single instance database, the Oracle Grid Infrastructure home includes Oracle Restart and Oracle Automatic Storage Management (Oracle ASM) software.

To use Oracle Automatic Storage Management or Oracle Restart, you must first install Oracle Grid Infrastructure for a standalone server before you install and create the database. Otherwise, you must manually register the database with Oracle Restart.

> **See Also:** Chapter 3, "Oracle Grid Infrastructure for a Standalone Server" for more information about installing Oracle Grid Infrastructure for a standalone server

1.3.7 Oracle Cluster Synchronization Services

When you install the Oracle Grid Infrastructure for a standalone server, Oracle Universal Installer configures the single-node version of Oracle Cluster Synchronization Services (CSS).

The CSS service is required to enable synchronization between an Oracle ASM instance and the database instances that rely on it for database file storage. Because the service must be running before an Oracle ASM instance or database instance starts, it is configured to start automatically by Oracle Restart before the Oracle ASM instance is started. It must be running if an Oracle database is using Oracle ASM for database file storage.

For single-instance installations, the CSS is installed-in and runs from the Oracle Grid Infrastructure home which is the same home that runs Oracle ASM.

> **Note:** On cluster systems with Oracle RAC installations, the CSS is configured during the Oracle Clusterware installation. If the system is running Oracle Clusterware, then refer to *Oracle Real Application Clusters Installation Guide* for information about removing Oracle RAC or Oracle Clusterware.

> **See Also:** "Oracle Automatic Storage Management" on page 1-13

1.3.8 Oracle Universal Installer Overview

Oracle Universal Installer is a Java-based graphical user interface (GUI) tool that enables you to install Oracle software. Oracle Universal Installer provides the following capabilities:

- Component and suite installations
- Globalization support
- Distributed installation support
- Unattended silent installations using response files
- Removal of installed components
- Multiple Oracle homes support

Oracle Universal Installer can run a silent or response file installation of Oracle software using response files. See Appendix C, "Installing and Configuring Oracle Database Using Response Files" for more information.

You must use the Oracle Universal Installer 11*g* to install components into an Oracle Database 11g Release 2 (11.2) Oracle home directory.

Oracle Universal Installer automatically installs the Oracle version of the Java Runtime Environment (JRE). This version is required to run Oracle Universal Installer and several Oracle assistants. Do *not* modify the JRE, unless doing so with a patch provided by My Oracle Support (formerly Oracle*MetaLink*). Visit the following site to find Oracle patches to download:

https://support.oracle.com/

When Oracle Universal Installer runs, it creates an `dbhome_n` directory, which keeps track of the components you are installing. Do not modify the contents of this directory. By default, this directory is located at the same directory level as `ORACLE_HOME`.

1.3.9 Oracle Base Directory

If you install Oracle Database 11*g* Release 2 (11.2) on a computer with no other Oracle software installed, Oracle Universal Installer creates an Oracle base directory for you. If Oracle software is installed, then one or more Oracle base directories exist. In the latter case, Oracle Universal Installer offers you a choice of Oracle base directories to install Oracle Database.

In a default Windows installation, the Oracle base directory appears as follows:

`DRIVE_LETTER:\app\username`

> **Note:** You can choose to create an Oracle base directory, even if other Oracle base directories exist on the system.

1.3.10 Oracle Home Directory

This section covers the following topics:

- Contents of the Oracle Home Environment
- Multiple Oracle Home Components

1.3.10.1 Contents of the Oracle Home Environment

The Oracle home directory is located under the Oracle base directory. For example, in a default Windows installation, if you name the Oracle home directory `dbhome_1`, it appears in the Oracle base directory as follows:

`DRIVE_LETTER:\app\username\product\11.2.0\dbhome_1`

An Oracle home corresponds to the environment in which Oracle components run. This environment includes the following:

- Location of installed component files
- `PATH` variable pointing to binary files of installed components
- Registry entries
- Service names
- Program groups

Oracle homes also have a name associated with them, which is automatically assigned by the installer.

1.3.10.2 Multiple Oracle Home Components

You can install all Oracle components in multiple Oracle homes on the same computer. However, some components can only support one active instance at a time. The current (latest) installation renders the previous one inactive. These components are:

- Oracle Administration Assistant for Windows

- Oracle Counters for Windows Performance Monitor

- Oracle Objects for OLE

- Oracle Provider for OLE DB

> **Note:** Oracle Objects for OLE is not supported on Windows x64.

1.3.11 Installing Oracle Database Vault in an Oracle Data Guard Environment

If you plan to use Oracle Data Guard with Oracle Database Vault, then refer to Note 754065.1 on the My Oracle Support (formerly Oracle*MetaLink*) Web site at the following URL:

https://support.oracle.com/

1.3.12 Oracle Database Vault Default Audit Policy and Initialization Parameters

Oracle Database Vault installs a baseline database auditing policy. This policy covers the access control configuration information stored in Database Vault database tables, information stored in Oracle Catalog (rollback segments, tablespaces, and so on), the use of system privileges, and Oracle Label Security configuration. When you install Oracle Database Vault, the security specific database initialization parameters are initialized with default values.

> **See Also:** *Oracle Database Vault Administrator's Guide* for more information about the database audit policy

1.4 Migration Considerations

Oracle Database 11*g* Release 2 (11.2) database for 32-bit Windows can be migrated to an Oracle Database 11*g* Release 2 (11.2) database for 64-bit Windows. See the "Migrating an Oracle Database 11g Release 2 (11.2) Database" section in the *Oracle Database Platform Guide for Microsoft Windows* for migration information.

1.5 Oracle Database Installation Methods

You can choose different installation methods to install Oracle Database, which are as follows:

- Interactive Installation Types

- Automated Installation Methods Using Response Files

1.5.1 Interactive Installation Types

When you use the interactive method to install Oracle Database by selecting the **Create and configure a database** option, Oracle Universal Installer displays a series of screens that enable you to specify all the required information to install the Oracle Database software and create a database.

Oracle Universal Installer provides you the following options:

- Desktop Class: Select this option if you are installing on a laptop or desktop class system. This option includes a starter database and allows minimal configuration. This option is designed for those who want to get up and running with the database quickly.

- Server Class: Select this option if you are installing on a server class system, such as what you would use when deploying Oracle in a production data center. This option allows for more advanced configuration options. Advanced configuration options available using this option include Oracle RAC, Oracle Automatic Storage Management, backup and recovery configuration, integration with Enterprise Manager Grid Control, and more fine-grained memory tuning, among others.

  Furthermore, the Server Class option provides you with the following installation types:

  – Typical: Select this installation method to quickly install Oracle Database. This installation type requires minimal user input. It installs the software and optionally creates a general-purpose database using the information that you specify on the screen. It is the default installation type.

  – Advanced: Select this installation type to complete any of the following tasks:

    – Select a database character set or different product languages

    – Create the EXAMPLE tablespace during the installation

    – Create a database on a different file system from the software

    – Specify different passwords for administrative schemas

    – Configure automated backups or Oracle Enterprise Manager notifications

    – Configure Oracle Configuration Manager

    – In the Select Database Edition screen, if you select **Enterprise Edition**, then Oracle Universal Installer automatically selects the components most customers need for their Oracle Database installation. You can also click **Select Options** to customize components from the components list.

      See Also: "Reviewing Component-Specific Installation Guidelines" on page 4-3

1.5.2 Automated Installation Methods Using Response Files

By creating a response file and specifying this file when you start Oracle Universal Installer, you can automate some or all of the Oracle Database installation. These automated installation methods are useful if you must perform multiple installations on similarly configured systems.

When you use a response file, you can run Oracle Universal Installer in the following modes, depending on whether you specify all of the required information or not:

- **Silent Mode:** Oracle Universal Installer runs in silent mode if you use a response file that specifies all required information, and specify the `-silent` option when

starting Oracle Universal Installer. None of the Oracle Universal Installer screens are displayed.

- **Response File Mode:** Oracle Universal Installer runs in response file mode if you do not specify all required information in the response file.

For more information about these modes and about how to complete an installation using response files, see Appendix C.

1.6 Software Updates Option

Use the Software Updates feature to dynamically download and apply the latest updates released by Oracle; such as, interim patch updates, critical patch updates, Oracle Universal Installer updates, and the latest patch set updates. This functionality is available starting with Oracle Database 11*g* Release 2 (11.2.0.2).

You can choose to download the latest updates by providing your My Oracle Support credentials or you can apply previously downloaded updates. You can also download the updates separately using the *-downloadUpdates* option and later apply them during the Oracle Database installation by providing the location where the updates are present.

> **See Also:** "Installing the Oracle Database Software" for more information about the -downloadUpdates option, and dynamically applying software updates during installation

1.7 Oracle Database Editions

You can choose one of the following installation types when installing Oracle Database 11*g*:

- **Enterprise Edition:** Installs licensable Oracle Database options, and database configuration and management tools in addition to all of the products that are installed during a Standard Edition installation. It also installs products most commonly used for data warehousing and transaction processing. This option also permits you to enable or disable individual components from a components list.

- **Standard Edition:** This installation type is designed for department or workgroup-level applications and for small and medium-sized enterprises (SMEs). It is engineered to provide core relational database management services and options. It installs an integrated set of management tools, full distribution, replication, Web features, and facilities for building business-critical applications.

- **Standard Edition One:** This installation type is designed for department, workgroup-level, or web applications. From single instance environments for small business to highly distributed branch environments, Oracle Database Standard Edition One includes all the facilities necessary to build business-critical applications.

- **Personal Edition:** Installs the same software as the Enterprise Edition installation type, but supports only a single user development and deployment environment that requires full compatibility with Enterprise Edition and Standard Edition. Oracle RAC is not installed with Personal Edition.

See Also:

- You must install Oracle Database Client separately. You cannot install it during an Oracle Database installation. See *Oracle Database Client Installation Guide for Microsoft Windows* for installation instructions

- *Oracle Database Licensing Information* for more information about the features available with each Oracle Database edition and for information about licensing

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Note:

- The installation process is the same for all the database editions.

- Ensure that you install only those products for which you have a valid license.

1.8 Database Configuration Options

You can create an Oracle database during the installation process. If you choose to create an Oracle database, Oracle Universal Installer uses Oracle Database Configuration Assistant to create it. You can create one of the preconfigured database types, which are designed for a variety of different applications, modify one of the preconfigured database types, or create a customized database to suit your own requirements.

This section describes the following database configuration options:

- Preconfigured Database Types

- Installation Choices That Affect Database Creation

- Creating a Database After Installation

1.8.1 Preconfigured Database Types

Oracle provides the following preconfigured database types that you can create or customize during the installation:

- General Purpose/Transaction Processing

- Data Warehouse

See the online help provided by either Oracle Universal Installer or Oracle Database Configuration Assistant for a description of these preconfigured database types.

1.8.2 Installation Choices That Affect Database Creation

Oracle Universal Installer runs Oracle Database Configuration Assistant in one of two modes, depending on the choices that you make during the installation:

- Silent or response file mode

  If you choose the Enterprise Edition, Standard Edition, or Personal Edition as the database edition, then choose to create a preconfigured database type. Oracle Universal Installer prompts you for the minimum amount of information required to create a database of the type you choose. It then runs Oracle Database Configuration Assistant in silent or response file mode to create the database after it installs the software.

> **Note:** Oracle recommends that you use this method to create a database if you have not previously created one.

- Interactive mode

  Install the database using Oracle Universal Installer and start Oracle Database Configuration Assistant from Oracle home. Oracle Database Configuration Assistant runs in interactive mode. Using the screens in Oracle Database Configuration Assistant, you can either modify one of the preconfigured database types or customize the database.

  > **Note:** If you choose this method to create a database, click the **Help** button on any of the Oracle Database Configuration Assistant screens for a description of the information that you must specify on that screen.

1.8.3 Creating a Database After Installation

If you decide not to create a database during the installation, you can use Oracle Database Configuration Assistant to create one after you have installed the software.

> **See Also:** *Oracle Database 2 Day DBA* for more information about using Oracle Database Configuration Assistant to create a database after installation

1.9 Database Storage Options

If you choose to create a database during the installation, you can specify the following storage options for database files:

- File System
- Oracle Automatic Storage Management

> **Note:** Installing files on raw devices is no longer an option during installation. You must use a file system, or use Oracle Automatic Storage Management.

1.9.1 File System

If you choose the file system option, then Oracle Database Configuration Assistant creates the database files in a directory on a file system on your computer. Oracle recommends that the file system you choose be separate from the file systems used by the operating system or the Oracle software. The file system that you choose can be any of the following:

- A file system on a disk that is physically attached to the system

  If you are creating a database on basic disks that are not logical volumes or RAID devices, then follow the Optimal Flexible Architecture (OFA) recommendations and distribute the database files over multiple disks.

- A file system on a logical volume manager (LVM) or a RAID device

  If you are using multiple disks in an LVM or RAID configuration, then Oracle recommends that you use the stripe-and-mirror-everything (SAME) methodology

to increase performance and reliability. Using this methodology, you must not specify multiple file system mounting points for database storage.

- A network file system (NFS) mounted from a certified network attached storage (NAS) device. You also have the option to use the Direct NFS feature, which simplifies the administration of NFS configurations and also offers performance improvements.

    See Also: "Direct NFS Client" for more information about the Direct NFS feature

    If the NAS device is certified by Oracle, then you can store the database files on them.

If you choose the Advanced database creation option, then you can also choose to use the Oracle-managed files feature with the new database. If you use this feature, then you must specify only the database object name instead of file names when creating or deleting database files.

> **See Also:** *Oracle Database Administrator's Guide* for more information about Oracle-managed files

1.9.2 Oracle Automatic Storage Management

Oracle Automatic Storage Management is a high-performance storage management solution. For Oracle Database files, it simplifies the management of a dynamic database environment, such as creating and laying out databases and managing disk space.

Oracle Automatic Storage Management can be used with single database installations, multiple database installations, and in Oracle RAC environments. It can be used with databases created in Oracle Database 10*g* Release 1 (10.1.0.3 or later). However, Oracle Database 11*g* Release 2 (11.2) databases must use Oracle Automatic Storage Management from Oracle Database 11*g* Release 2 (11.2) or later. Oracle Automatic Storage Management is installed as part of the Oracle Grid Infrastructure installation. If you plan to use Oracle Automatic Storage Management, then you must install Oracle Grid Infrastructure before you install and create the database. If you want to upgrade an existing Oracle Automatic Storage Management installation, then you must upgrade Oracle Automatic Storage Management by running an Oracle Grid Infrastructure upgrade.

> **See Also:** Chapter 3, "Oracle Grid Infrastructure for a Standalone Server" for more information about installing the Oracle Grid Infrastructure software

Oracle Automatic Storage Management manages the storage of all database files, such as redo logs, control files, and data pump export files. Oracle Automatic Storage Management can manage the Oracle Database executable binary files and any other non-database file by creating a file system with Oracle Automatic Storage Management Cluster File System. Though Oracle Automatic Storage Management Cluster File System is cluster aware, it works as a file system on a single instance database also.

To use Oracle Automatic Storage Management, you allocate partitioned disks to Oracle with preferences for striping and mirroring. Oracle Automatic Storage Management manages the disk space for you, thus eliminating the need for traditional disk management tools such as logical volume managers (LVM), file systems, and the numerous commands necessary to manage both. The synchronization between Oracle

Automatic Storage Management and the database instance is handled by Oracle Cluster Synchronization Services (CSS).

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for more information about Oracle Automatic Storage Management Cluster File System

1.9.2.1 Oracle Automatic Storage Management Components

Oracle Automatic Storage Management uses the following components:

- Oracle Automatic Storage Management Disk Groups
- Oracle Automatic Storage Management Instance

Oracle Automatic Storage Management Disk Groups

A disk group is a set of disk devices that Oracle Automatic Storage Management manages as a unit. Each disk device can be an individual physical disk, a multiple disk device such as a RAID storage array or a logical volume, or a partition on a physical disk. However, mostly, disk groups consist of one or more individual physical disks. To enable Oracle Automatic Storage Management to balance I/O and storage appropriately within the disk group, ensure that all devices in the disk group have similar, if not identical, storage capacity and performance.

You can set the redundancy and striping attributes of individual file types within a disk group by using Oracle Automatic Storage Management disk group templates. When you create a disk group, Oracle Automatic Storage Management creates a set of default templates for that disk group. Default template settings depend on the disk group type. For example, the default template for control files for a normal redundancy disk group sets three-way mirroring. All other file templates are two-way mirrored. For a high redundancy disk group, the default mirroring cannot be changed; that is, all files are always three-way mirrored in a high redundancy disk group. You can modify the default templates to suit the unique needs of your site. See *Oracle Automatic Storage Management Administrator's Guide* for more information.

Oracle Automatic Storage Management spreads data evenly across all of the devices in the disk group to optimize performance and utilization. You can add or remove disk devices from a disk group without shutting down the database. When you add or remove disks, Oracle Automatic Storage Management rebalances the data files across the disk group. You can create multiple disk groups to handle specific tasks, such as backup and recovery operations, in addition to routine file storage activities.

When you add a device to a disk group, you can specify a failure group for that device. Failure groups identify disk devices that have common failure characteristics, for example, devices that are attached to the same controller. If the controller fails, then all devices attached to it become unavailable. By default, each device also belongs to its own failure group. By using the failure groups you specify, Oracle Automatic Storage Management can distribute data among the devices in the disk group to help minimize the risk of data loss caused by component failures.

Oracle Automatic Storage Management Instance

The Oracle Automatic Storage Management instance is a special Oracle instance that manages Oracle Automatic Storage Management disk groups. The Oracle Automatic Storage Management instance and the ASMSNMP account are created as part of the Oracle Grid Infrastructure home. Oracle Enterprise Manager uses this account to monitor Oracle ASM instances to retrieve data from Oracle ASM-related data dictionary views. The ASMSNMP account status is set to OPEN upon creation, and it is granted the SYSDBA privilege.

There is only one Oracle ASM instance per host regardless of the number of database instances running on that host.

> **See Also:**
>
> - "Step 3: Manually Configuring Disks for Oracle Automatic Storage Management" on page 3-11
>
> - "Managing Oracle ASM Users with Oracle Enterprise Manager" in *Oracle Automatic Storage Management Administrator's Guide* for more information about ASMSNMP user

1.10 Database Management Options

To simplify database administration, Oracle provides a Web-based management tool called Oracle Enterprise Manager.

There are two ways that you can deploy Oracle Enterprise Manager:

- Deploy Oracle Enterprise Manager centrally in your environment.

  To deploy Oracle Enterprise Manager centrally, you must install at least one Oracle Management Repository and one Oracle Management Service within your environment, then install an Oracle Enterprise Management Agent on every computer. You then can use a single HTML interface to manage and monitor software and hardware targets on all of those systems. Targets can include Oracle databases, application servers, Net listeners, and third-party software. This single interface is called Oracle Enterprise Manager Grid Control (or simply Grid Control).

  > **Note:**
  >
  > - Oracle Enterprise Manager is available separately on the Oracle Enterprise Manager Grid Control installation media.
  >
  > - For latest certification information, refer to My Oracle Support note 412431.1, "Oracle Enterprise Manager Grid Control Certification Checker", available from the following URL:
  >
  >   `https://support.oracle.com/`

- Deploy Oracle Enterprise Manager Database Control locally on the database system.

  Oracle Enterprise Manager Database Control software is installed by default with every Oracle Database installation. This local installation provides a Web-based interface called Oracle Enterprise Manager Database Control. The Database Control is similar in function to the Grid Control, but it can manage only a single database. If you want to administer multiple databases on this system, you must either configure a separate Database Control for each database, or install Oracle Enterprise Manager 11*g* Grid Control.

  > **See Also:** *Oracle Enterprise Manager Concepts* and *Oracle Enterprise Manager Grid Control Basic Installation Guide* for more information about Oracle Enterprise Manager

This section contains the following topics:

- [Management Options for Preconfigured Databases](#)
- [Management Options for Custom Databases](#)
- [Features Provided by Oracle Enterprise Manager Database Control](#)

1.10.1 Management Options for Preconfigured Databases

When you create a preconfigured database during the installation, you must select the Oracle Enterprise Manager interface to manage the database. The following options are available:

- Use Grid Control for central database management.

  This option is available only if an Oracle Management Agent is installed on the system. When Oracle Universal Installer detects Oracle Management Agent on the system, you can choose this option and specify the Oracle Management Service to manage the database.

  If an Oracle Management Agent is not installed, you must use Database Control to manage the database. However, if you install Oracle Management Agent after you install Oracle Database, you can use Grid Control to manage this database.

- Use Database Control for local database management.

  This option is selected by default if an Oracle Management Agent is not installed on the system. However, even if a Management Agent is installed, you can still configure Database Control to manage the database.

1.10.2 Management Options for Custom Databases

Install the database using Oracle Universal Installer and start Oracle Database Configuration Assistant from Oracle home. Oracle Database Configuration Assistant runs in interactive mode. Using a screen in Oracle Database Configuration Assistant, you can specify the Oracle Enterprise Manager interface to manage the database. Alternatively, you can choose not to configure the database with Enterprise Manager.

Oracle recommends that you configure the database to use Enterprise Manager during installation. However, if you choose not to configure the database to use Enterprise Manager during the installation, you can use Oracle Database Configuration Assistant after the installation to configure the database to use it.

1.10.3 Features Provided by Oracle Enterprise Manager Database Control

Oracle Enterprise Manager Database Control, which is installed by default with Oracle Database, provides a Web-based user interface that you can use to monitor, administer, and maintain an Oracle database. You can use it to perform all of your database administration tasks. You can also use it to determine information about the database, such as:

- Instance name, database version, Oracle home location, media recovery options, and other instance data
- Current instance availability
- Database alert information
- Automatic notification of security alerts
- Ability to apply patches
- Session and SQL-related performance information

■ Space usage metrics

1.11 Database Backup and Recovery Options

If you use Oracle Enterprise Manager Database Control during the installation, you can optionally enable automated database backups that use the Oracle-suggested default backup strategy.

You do not have to enable automated backups during the installation. If you prefer, you can use Oracle Enterprise Manager Database Control or Grid Control to configure automated backups after you install the software and create a database.

This section covers the following topics:

■ Enabling Automated Backups

■ Backup Job Default Settings

> **See Also:**
>
> ■ *Oracle Database 2 Day DBA* for information about using Oracle Enterprise Manager Database Control to configure or customize automated backups or to recover a backed up database
>
> ■ *Oracle Database Backup and Recovery User's Guide* for more detailed information about defining a backup strategy and backing up and recovering Oracle databases

1.11.1 Enabling Automated Backups

If you enable automated backups, Oracle Enterprise Manager schedules a daily backup job that uses Oracle Database Recovery Manager (RMAN) to back up all of the database files to an on-disk storage area called the fast recovery area. The size of the fast recovery area is determined by the size of the database you must back up. The first time the backup job runs, it creates a full backup of the database. Subsequent backup jobs perform incremental backups, which enable you to recover the database to its state at any point during the preceding 24 hours. If you want to create an online backup, you must run the backup job in ARCHIVELOG mode.

To enable automated backup jobs during installation, you must specify the following information:

■ The location of the fast recovery area

You can use either a file system directory or an Oracle Automatic Storage Management disk group for the fast recovery area. The default disk quota configured for the fast recovery area is 2 GB. For Oracle Automatic Storage Management disk groups, the required disk space depends on the redundancy level of the disk group that you choose. Chapter 2 describes how to choose the location of the fast recovery area and identifies its disk space requirements.

■ An operating system user name and password for the backup job

Oracle Enterprise Manager uses the operating system credentials that you specify when running the backup job. The user name that you specify must belong to the Windows group that identifies database administrators (the ORA_DBA group). This user also must have Logon As A Batch Job privilege.

1.11.2 Backup Job Default Settings

If you enable automated backups after choosing one of the preconfigured databases during the installation, automated backup is configured with the following default settings:

- The backup job is scheduled to run nightly at 2 a.m.

- The disk quota for the fast recovery area is 2 GB.

If you enable automated backups by using Oracle Database Configuration Assistant, either during or after the installation, you can specify a different start time for the backup job and a different disk quota for the fast recovery area.

1.12 Email Notification Options

If you choose to use Oracle Enterprise Manager Database Control during the installation, you can configure Enterprise Manager to send e-mail when specific events occur. These events can include occurrences such as disk space reaching a critical limit (a threshold), or a database shutting down unexpectedly.

If you enable e-mail notifications, you must specify the following information:

- The host name of a simple mail transport protocol (SMTP) server.

- The e-mail address that should receive the alerts.

  The e-mail address that you specify can belong to an individual, or can be a shared e-mail account, or can be a distribution list.

You can use Enterprise Manager Database Control to setup, change, or customize e-mail notifications after you have created the database.

> **Note:** The option to enable e-mail notifications is not available starting with Oracle Database 11*g* Release 2 (11.2.0.2).

1.13 Upgrade Considerations

Oracle recommends installing Oracle Database 11*g* Release 2 (11.2) into a new Oracle home directory. If you must install Oracle Database 11*g* Release 2 (11.2) into an Oracle home directory that contains previously installed Oracle8*i* or Oracle9*i* components, then use Oracle Universal Installer to remove these components before beginning a new installation.

See *Oracle Database Upgrade Guide* before deciding to upgrade an existing database. Supported upgrade paths and upgrade procedures are covered in *Oracle Database Upgrade Guide*. However, this section describes several Windows-specific issues to understand before following the instructions in *Oracle Database Upgrade Guide*.

This section contains these topics:

- Upgrading Your Operating System Before a Database Upgrade

- Oracle Automatic Storage Management Is Installed with Oracle Grid Infrastructure

- Daylight Saving Time Upgrade

- Policies for Client and Application Software Installations

- Downgrading a Database

1.13.1 Upgrading Your Operating System Before a Database Upgrade

When you upgrade to a new release of Oracle Database, the operating system requirements may have changed. If required, upgrade your operating system before upgrading Oracle Database. See Chapter 2, "Oracle Database Preinstallation Requirements" for a list of supported operating systems.

To upgrade the operating system and then perform a database upgrade, perform one of the following procedures:

- Upgrading the Operating System
- Migrating to a New Computer

1.13.1.1 Upgrading the Operating System

Upgrade the operating system. Then, upgrade the database either manually or by using Oracle Database Upgrade Assistant.

1.13.1.2 Migrating to a New Computer

Migrate to a new computer using one of the following methods:

- To upgrade the database on the new computer:

  1. Copy the database files from the computer running the previous operating system to the one running the supported operating system.

  2. Re-create the control files on the computer running the supported operating system.

  3. Manually upgrade the database using the method described in *Oracle Database Upgrade Guide*.

     Note: You cannot use Oracle Database Upgrade Assistant if you use this method. However, this method lets you easily revert to the earlier database.

- You can also upgrade the database using the Export/Import utilities method described in *Oracle Database Upgrade Guide*.

  See Also: The table on "Supported Upgrade Paths for Upgrading Oracle Database" in *Oracle Database Upgrade Guide* for information about upgrading your current database release

1.13.2 Oracle Automatic Storage Management Is Installed with Oracle Grid Infrastructure

In previous releases, Oracle Automatic Storage Management (Oracle ASM) was installed as part of the Oracle Database installation. With Oracle Database 11*g* Release 2 (11.2), Oracle Automatic Storage Management is part of an Oracle Grid Infrastructure installation, either for a cluster, or for a standalone server.

If you want to upgrade an existing Oracle Automatic Storage Management installation, then you must upgrade Oracle Automatic Storage Management by running an Oracle Grid Infrastructure upgrade. If you do not have Oracle Automatic Storage Management installed and you want to use Oracle Automatic Storage Management as your storage option, then you must complete an Oracle Grid Infrastructure installation before you start your Oracle Database installation.

> **See Also:** *Oracle Database Upgrade Guide*

1.13.3 Daylight Saving Time Upgrade

See "Daylight Saving Time Upgrade of Timestamps with Timezone Data Type" for information about Daylight Savings Time Upgrade.

1.13.4 Policies for Client and Application Software Installations

If you upgrade your Oracle Database to 11*g* Release 2 (11.2), then Oracle recommends that you upgrade the client software to Oracle Database 11*g* Release 2 (11.2) as well. Keeping the server and client software at the same release number ensures maximum stability for your applications. In addition, the latest Oracle client software may provide added functionality and performance enhancements that were not available with previous releases.

1.13.5 Downgrading a Database

Steps to downgrade a database, including steps to change the word size, are covered in *Oracle Database Upgrade Guide*.

2

Oracle Database Preinstallation Requirements

This chapter describes the tasks that you must complete before you start Oracle Universal Installer.

This guide contains information required to install Oracle Database 11*g* Release 2 (11.2). Ensure that you review information related to the platform on which you intend to install Oracle Database 11*g*.

Note:

- To use Oracle Automatic Storage Management (Oracle ASM) or Oracle Restart, you must first install Oracle Grid Infrastructure before you install and create the database. Otherwise, you must manually register the database with Oracle Restart. See "Installing Oracle Grid Infrastructure for an Existing Database" on page 3-19

- Additionally, see "Requirements for Oracle Grid Infrastructure Installation" on page 3-2 before you proceed with the database preinstallation tasks.

It includes information about the following topics:

- Oracle Database Hardware Requirements
- Oracle Database Software Requirements
- Windows Certification and Web Browser Support
- Reviewing Operating System Security Common Practices
- Confirming Host Name Resolution
- Checking the Network Setup
- Individual Component Requirements

2.1 Oracle Database Hardware Requirements

This section describes hardware component and hard disk space requirements.

- Hardware Component Requirements for Windows 32-Bit
- Hardware Component Requirements for Windows x64
- Hard Disk Space Requirements
- Verifying Hardware Requirements

2.1.1 Hardware Component Requirements for Windows 32-Bit

The following table lists the hardware components that are required for Oracle Database on Windows 32-bit.

Table 2–1   Windows 32-Bit Hardware Requirements

Requirement	Value
System Architecture	Processor: Intel (x86), AMD64, and Intel EM64T
	Note: Oracle provides 32-bit (Windows x86) and 64-bit (Windows x64) versions of Oracle Database for Microsoft Windows.
Physical memory (RAM)	1 GB minimum
	On Windows 7, Windows 8, Windows 8.1, 2 GB minimum
Virtual memory	■ If physical memory is between 2 GB and 16 GB, then set virtual memory to 1 times the size of the RAM
	■ If physical memory is more than 16 GB, then set virtual memory to 16 GB
Disk space	Typical Install Type total: 5.35 GB
	Advanced Install Types total: 4.89 GB
	See Table 2–3 for details.
Video adapter	256 colors
Screen Resolution	1024 X 768 minimum

See Also:

- "Configuring Disk Storage for Oracle Data Files and Recovery Files" on page 2-16
- "Creating Directories for Oracle Data Files or Recovery Files" on page 2-17
- "Preparing Disks for an Oracle Automatic Storage Management Installation" on page 3-5
- "Installing with Minimum Memory Requirements" on page 4-2

2.1.2 Hardware Component Requirements for Windows x64

The following table lists the hardware components that are required for Oracle Database on Windows x64.

Table 2–2   Windows x64 Hardware Requirements

Requirement	Value
System Architecture	Processor: AMD64 and Intel EM64T
	Note: Oracle provides 32-bit (Windows x86) and 64-bit (Windows x64) versions of Oracle Database for Microsoft Windows.
Physical memory (RAM)	1 GB minimum
	On Windows 7, Windows 8, Windows 8.1, 2 GB minimum

Table 2–2   (Cont.) Windows x64 Hardware Requirements

Requirement	Value
Virtual memory	■ If physical memory is between 2 GB and 16 GB, then set virtual memory to 1 times the size of the RAM ■ If physical memory is more than 16 GB, then set virtual memory to 16 GB
Disk space	Typical Install Type total: 5.39 GB Advanced Install Types total: 5.89 GB See Table 2–4 for details.
Processor for Windows x64	550 MHz minimum
Video adapter	256 colors
Screen Resolution	1024 X 768 minimum

See Also:

- "Configuring Disk Storage for Oracle Data Files and Recovery Files" on page 2-16

- "Creating Directories for Oracle Data Files or Recovery Files" on page 2-17

- "Preparing Disks for an Oracle Automatic Storage Management Installation" on page 3-5

- "Installing with Minimum Memory Requirements" on page 4-2

2.1.3 Hard Disk Space Requirements

This section lists system requirements for Windows platforms that use the NT File System (NTFS). Oracle strongly recommends that you install the Oracle database home (Oracle database binaries, trace files, and so on) on Oracle ACFS or NTFS; the database files themselves must be placed on Oracle ASM if using Oracle ACFS; otherwise they can be placed on NTFS. Usage of Oracle ACFS and Oracle ASM or NTFS instead of FAT32 is recommended to ensure security of these files.

The NTFS system requirements listed in this section are more accurate than the hard disk values reported by the Oracle Universal Installer Summary window. The Summary window does not include accurate values for disk space, the space required to create a database, or the size of compressed files that are expanded on the hard drive.

The hard disk requirements for Oracle Database components include 32 MB to install Java Runtime Environment (JRE) and Oracle Universal Installer on the partition where the operating system is installed. If sufficient space is not detected, installation fails and an error message appears.

Table 2–3 lists the disk space requirements on NTFS for Windows 32-bit.

Table 2–4 lists the disk space requirements on NTFS for Windows x64. The starter database requires 720 MB of disk space.

The figures in these tables include the starter database. FAT32 space requirements are slightly higher.

Table 2–3   Windows 32-Bit Disk Space Requirements on NTFS

Installation Type	TEMP Space	SYSTEM_DRIVE:\ Program Files\Oracle	Oracle Home	Data Files *	Total
Typical Install	500 MB	4.0 MB	3.6 GB	1.9 GB	5.99 GB
Advanced Install: All Editions	500 MB	4.0 MB	3.6 GB **	1.9 GB **	5.99 GB **

Table 2–4   Windows x64 Disk Space Requirements on NTFS

Installation Type	TEMP Space	SYSTEM_DRIVE:\ Program Files\Oracle	Oracle Home	Data Files *	Total
Typical Install	500 MB	4.0 MB	3.80 GB	1.9 GB	6.22 GB
Advanced Install: All Editions	500 MB	4.55 MB	3.80 GB **	1.9 GB **	6.22 GB **

* Refers to the contents of the `admin`, `cfgtoollogs`, `flash_recovery_area`, and `oradata` directories in the `ORACLE_BASE` directory.

** This size can be higher depending on the installation options selected, such as languages or additional components. If you choose to install Oracle Database with automated backups enabled, include at least 2 GB extra for data file disk space.

> **See Also:**   "NTFS File System and Windows Registry Permissions" in *Oracle Database Platform Guide for Microsoft Windows*

2.1.4 Verifying Hardware Requirements

To ensure that the system meets these requirements, follow these steps:

1. Determine the physical RAM size.

   For example, on a Windows Server 2003 computer, double-click **System** in the Windows Control Panel and click the **General** tab.

   On a Windows Server 2008 R2 computer, click **System and Security** in the Windows Control Panel, then click **System**.

   If the size of the physical RAM installed in the system is less than the required size, then you must install more memory before continuing.

2. Determine the size of the configured virtual memory (also known as paging file size).

   For example, on a Windows 2003 computer, double-click **System**, click the **Advanced** tab, and click **Settings** in the Performance section. Then click the **Advanced** tab.

   On a Windows Server 2008 R2 computer, click **System and Security**, then click **System**, click **Advanced System Settings**, click the **Advanced** tab on System Properties page, and then click **Settings** in the Performance section. Then select the **Advanced** tab on Performance Options page.

   The virtual memory is listed in the Virtual Memory section.

   If necessary, see your operating system documentation for information about how to configure additional virtual memory.

3. Determine the amount of free disk space on the system.

For example, on a Windows 2003 computer, double-click **My Computer**, right-click the drive where the Oracle software is to be installed, and select **Properties**.

On a Windows Server 2008 R2 computer, right-click **My Computer** and click **Open**.

4. Determine the amount of disk space available in the `temp` directory. This is equivalent to the total amount of free disk space, minus what is required for the Oracle software to be installed.

On Windows 32-bit, if there is less than 500 MB of disk space available in the `temp` directory, then delete all unnecessary files. If the temp disk space is still less than 500 MB, then set the `TEMP` or `TMP` environment variable to point to a different hard drive location.

On Windows x64, if there is less than 500 MB of disk space available in the `temp` directory, then delete all unnecessary files. If the temp disk space is still less than 125 MB, then set the `TEMP` or `TMP` environment variable to point to a different hard drive location.

For example, to change the environment variables on a Windows Server 2003 computer, double-click **System**, click the **Advanced** tab, and click **Environment Variables**.

On a Windows Server 2008 R2 computer, click **System and Security**, then click **System**, click **Advanced System Settings**, click the **Advanced** tab on System Properties page, and then click **Environment Variables**.

2.2 Oracle Database Software Requirements

Table 2–5 lists the software requirements for Oracle Database on Windows 32-bit.

Table 2–6 lists the software requirements for Oracle Database on Windows x64.

Table 2–5   Windows 32-Bit Software Requirements

Requirement	Value
Operating System	Oracle Database for 32-bit Windows is supported on the following operating systems:
	■ Windows Server 2003 - all editions
	■ Windows Server 2003 R2 - all editions
	■ Windows XP Professional
	■ Windows Vista - Business, Enterprise, and Ultimate editions
	■ Windows Server 2008 - Standard, Enterprise, Datacenter, and Web editions.
	■ Windows 7 - Professional, Enterprise, and Ultimate editions
	■ Windows 8 - Pro and Enterprise editions
	■ Windows 8.1 - Pro and Enterprise edition
	Windows Multilingual User Interface Pack is supported.
	The Server Core option is not supported for all Windows Server operating systems.
	Note: For information about Hyper-V support, visit My Oracle Support (formerly Oracle*MetaLink*) at
	https://support.oracle.com/epmos/faces/DocumentDisplay?id=1563794.1
	See Also: "Hardware and Software Certification" for information about how to access the latest system requirements
Compiler	Pro*COBOL has been tested and certified with Net Express 5.0.
	The following components are supported with the Microsoft Visual C++ .NET 2005 8.0, Microsoft Visual C++ .NET 2008 9.0, and Intel 10.1 C compilers:
	■ Oracle Call Interface
	■ External callouts
	■ Pro*C/C++
	■ XDK
	Oracle C++ Call Interface is supported with
	■ Microsoft Visual C++ .NET 2005 8.0
	■ Microsoft Visual C++ .NET 2008 9.0 - OCCI libraries are installed under `ORACLE_HOME`\oci\lib\msvc\vc9. When developing OCCI applications with MSVC++ 9.0, ensure that the OCCI libraries are correctly selected from this directory for linking and executing.
	■ Intel 10.1 C++ compiler with Microsoft Visual C++ .NET 2005 STLs.
Network Protocol	The **Oracle Net foundation layer** uses Oracle protocol support to communicate with the following industry-standard network protocols:
	■ TCP/IP
	■ TCP/IP with SSL
	■ Named Pipes

See Also:

- "Remote Desktop Services" on page 2-8

Table 2–6   Windows x64 Software Requirements

Requirement	Value
Operating System	Oracle Database for Windows x64 is supported on the following operating systems: - Windows Server 2003 - all x64 editions - Windows Server 2003 R2 - all x64 editions - Windows XP Professional x64 Edition - Windows Vista x64 - Business, Enterprise, and Ultimate editions - Windows Server 2008 x64 - Standard, Enterprise, Datacenter, and Web editions - Windows Server 2008 R2 x64 - Standard, Enterprise, Datacenter, Web, and Foundation editions - Windows 7 x64 - Professional, Enterprise, and Ultimate editions - Windows 8 x64 - Pro and Enterprise editions - Windows 8.1 x64 - Pro and Enterprise editions **Note:** Starting with Oracle Database 11*g* Release 2 (11.2.0.4), Oracle Database supports Windows Server 2012 x64 and Windows Server 2012 R2 x64 on the Standard, Datacenter, Essentials, and Foundation editions. Windows Server 2012 R2 x64 requires Windows Database bundle patch 11.2.0.4.14 or higher. **Note:** Windows Multilingual User Interface Pack is supported. **Note:** The Server Core option is not supported for all Windows Server operating systems. **See Also:** For information about Hyper-V support, visit My Oracle Support (formerly Oracle*MetaLink*) at https://support.oracle.com/epmos/faces/DocumentDisplay?id=1563794.1 **See Also:** "Hardware and Software Certification" for information about how to access the latest system requirements

Table 2–6   (Cont.) Windows x64 Software Requirements

Requirement	Value
Compiler	Pro*COBOL has been tested and certified with Net Express 5.0.
	The following components are supported with the Microsoft Visual C++ .NET 2005 8.0, Microsoft Visual C++ .NET 2008 9.0, and Intel 10.1 C compilers:
	■ Oracle Call Interface
	■ External callouts
	■ Pro*C/C++
	■ XDK
	Oracle C++ Call Interface is supported with
	■ Microsoft Visual C++ .NET 2005 8.0
	■ Microsoft Visual C++ .NET 2008 9.0 - OCCI libraries are installed under `ORACLE_HOME`\oci\lib\msvc\vc9. When developing OCCI applications with MSVC++ 9.0, ensure that the OCCI libraries are correctly selected from this directory for linking and executing.
	■ Intel 10.1 C++ compiler with Microsoft Visual C++ .NET 2005 STLs.
Network Protocol	The **Oracle Net foundation layer** uses Oracle protocol support to communicate with the following industry-standard network protocols:
	■ TCP/IP
	■ TCP/IP with SSL
	■ Named Pipes

See Also:

■ "Remote Desktop Services" on page 2-8

2.3 Windows Certification and Web Browser Support

The following sections provide certification information:

■ Remote Desktop Services

■ Web Browser Support

■ Default Share Configuration Requirement

2.3.1 Remote Desktop Services

Oracle supports installing, configuring, and running Oracle Database through Remote Desktop Services, formerly known as Terminal Services, on Windows. To install Oracle Database, Oracle recommends that you start all configuration tools from the Terminal Server console session of the server (using `mstsc/console`).

Platform-specific support information is as follows:

■ Windows Server 2003 and Windows Server 2003 R2: You can configure Windows Server 2003 and Windows Server 2003 R2 to use Terminal Services in Remote Desktop for Administration Mode or Terminal Server Mode.

■ Windows client operating systems: The Remote Desktop is only available in Single User Mode.

■ Windows Server 2008 and later: You can have multiple Remote Desktop sessions.

> **See Also:**
>
> ■ The Microsoft Web site for more information about Remote Desktop Services
>
>   http://www.microsoft.com/
>
> ■ The My Oracle Support (formerly Oracle*MetaLink*) Web site for the latest Terminal Services and Remote Desktop Services information
>
>   https://support.oracle.com/

2.3.2 Oracle Services for Microsoft Transaction Server

Oracle Services for Microsoft Transaction Server running on Windows Vista requires a minimum of Service Pack 1 or higher.

2.3.3 Web Browser Support

You do not require a web browser to install Oracle Database. However, web browsers are required to access documentation, and to use Oracle Enterprise Manager Database Control and Oracle Application Express. Web browsers must support JavaScript, and the HTML 4.0 and CSS 1.0 standards.

Oracle Enterprise Manager supports the following browsers:

■ Netscape Navigator 8.1

■ Netscape Navigator 9.0

■ Microsoft Internet Explorer 10.0 (supports Oracle Enterprise Manager Database Control 11.2.0.3 or higher)

■ Microsoft Internet Explorer 9.0

■ Microsoft Internet Explorer 8.0

■ Microsoft Internet Explorer 7.0 SP1

■ Microsoft Internet Explorer 6.0 SP2

■ Firefox 21.0 (supports Oracle Enterprise Manager Database Control 11.2.0.4)

■ Firefox 17.0.6 ESR (supports Oracle Enterprise Manager Database Control 11.2.0.4)

■ Firefox 3.6

■ Firefox 3.5

■ Firefox 3.0.7

■ Firefox 2.0

■ Safari 4.0.x

■ Safari 3.2

■ Safari 3.1

■ Google Chrome 27.0 (supports Oracle Enterprise Manager Database Control 11.2.0.4)

■ Google Chrome 4.0

■ Google Chrome 3.0

> **See Also:** *Oracle Application Express Installation Guide* for a list of browsers supported with Oracle Application Express

2.3.4 Default Share Configuration Requirement

The prerequisite checks during Oracle Database installation require that the system drive on your computer has default share configured on it. Use the `net use` command to verify, for example:

```
C:\> net use \\hostname\c$
The command completed successfully
```

Ensure that the current user, the user in the Administrator group, has all the privileges on the default share.

2.4 Reviewing Operating System Security Common Practices

Secure operating systems are an important basis for general system security. Ensure that your operating system deployment is in compliance with common security practices as described in your operating system vendor security guide.

2.5 Confirming Host Name Resolution

Typically, the computer on which you want to install Oracle Database is connected to a network. Ensure that the computer host name is resolvable through a Domain Name System (DNS), a network information service (NIS), or a centrally-maintained TCP/IP host file, such as `/etc/hosts`. Use the `ping` command to ensure that your computer host name is resolvable. For example:

```
ping myhostname
pinging myhostname.example.com [192.0.2.2] with 32 bytes of data:
Reply from 192.0.2.2: bytes=32 time=138ms TTL=56
```

If your computer host name does not resolve, then contact your system administrator.

2.6 Checking the Network Setup

Typically, the computer on which you want to install Oracle Database is connected to the network, has local storage to contain the Oracle Database installation, has a display monitor, and has a media drive.

This section describes how to install Oracle Database on computers that do not meet the typical scenario. It covers the following topics:

■ Installing Oracle Database on Computers with Multiple IP Addresses

■ Installing Oracle Database on Computers with Multiple Aliases

■ Installing Oracle Database on Nonnetworked Computers

■ Installing a Loopback Adapter

2.6.1 Installing Oracle Database on Computers with Multiple IP Addresses

You can install Oracle Database on a computer that has multiple IP addresses, also known as a multihomed computer. Typically, a multihomed computer has multiple network cards. Each IP address is associated with a host name; additionally, you can

set up aliases for the host name. By default, Oracle Universal Installer uses the ORACLE_ HOSTNAME environment variable setting to find the host name.

Clients must be able to access the computer using this host name, or using aliases for this host name. To check, ping the host name from the client computers using the short name (host name only) and the full name (host name and domain name). Both must work.

Setting the ORACLE_HOSTNAME Environment Variable

To set the ORACLE_HOSTNAME environment variable:

1. Display **System** in the Windows Control Panel.

2. In the System Properties dialog box, click **Advanced**.

3. In the **Advanced** tab, click **Environment Variables**.

4. In the Environment Variables dialog box, under System Variables, click **New**.

5. In the New System Variable dialog box, enter the following information:

   - **Variable name**: ORACLE_HOSTNAME

   - **Variable value**: The host name of the computer to use.

6. Click **OK**, then in the Environment Variables dialog box, click **OK**.

7. Click **OK** in the Environment Variables dialog box, then in the System Properties dialog box, click **OK**.

2.6.2 Installing Oracle Database on Computers with Multiple Aliases

A computer with multiple aliases is registered with the naming service under a single IP address but with multiple aliases. The naming service resolves any of those aliases to the same computer. Before installing Oracle Database on such a computer, set the ORACLE_HOSTNAME environment variable to the computer whose host name you want to use.

2.6.3 Installing Oracle Database on Nonnetworked Computers

You can install Oracle Database on a non-networked computer. If the computer, such as a laptop, is configured for DHCP and you plan to connect the computer to the network after the Oracle Database installation, perform these steps before you install Oracle Database on the non-networked computer.

1. Install a loopback adapter on the computer.

   The loopback adapter and local IP address simulate a networked computer. If you connect the computer to the network, Oracle Database still uses the local IP address and host name.

   > **See Also:** "Installing a Loopback Adapter" on page 2-12

2. Ping the computer from itself, using only the host name and using the fully qualified name, which should be in the *DRIVE_ LETTER:*\system32\drivers\etc\hosts file.

   For example, if you installed a loopback adapter on a computer called mycomputer on the mydomain.com domain, check the following:

   ```
   DRIVE_LETTER:\>ping mycomputer          Ping itself using just the
   hostname.
   ```

```
Reply from 10.10.10.10                    Returns local IP.
DRIVE_LETTER:\>ping mycomputer.mydomain.com    Ping using a fully qualified
name.
Reply from 10.10.10.10                    Returns local IP.
```

> **Note:** When you ping a computer from itself, the `ping` command should return the local IP address (the IP address of the loopback adapter).

If the `ping` command fails, contact your network administrator.

Connecting the Computer to the Network after Installation

If you connect the computer to a network after installation, the Oracle Database instance on your computer can work with other instances on the network. Remember that you must have installed a loopback adapter on your computer. Your computer can use a static IP or DHCP, depending on the network to which you are connected.

2.6.4 Installing a Loopback Adapter

When you install a loopback adapter, the loopback adapter assigns a local IP address for your computer. After the loopback adapter is installed, there are at least two network adapters on your computer: your own network adapter and the loopback adapter. To run Oracle Database on Windows, set the loopback adapter as the primary adapter.

You can change the bind order for the adapters without reinstalling the loopback adapter. The bind order of the adapters to the protocol indicates the order in which the adapters are used. When the loopback adapter is used first for the TCP/IP protocol, all programs that access TCP/IP first probe the loopback adapter. The local address is used for tools, such as Oracle Enterprise Manager. Any other applications that use a different Ethernet segment are routed to the network card.

A loopback adapter is required if:

- You are installing on a DHCP computer, or
- You are installing on a non-networked computer and plan to connect the computer to a network after installation.

> **See Also:** "Installing Oracle Database on Nonnetworked Computers" on page 2-11

This section covers the following topics:

- Checking if a Loopback Adapter Is Installed on Your Computer
- Installing a Loopback Adapter on Windows Server 2003, Windows Server 2003 R2, or Windows XP
- Installing a Loopback Adapter on Windows Vista and Windows Server 2008
- Installing a Loopback Adapter on Windows 7 and Windows Server 2008 R2
- Installing Microsoft KM-TEST Loopback Adapter on Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2
- Removing a Loopback Adapter

2.6.4.1 Checking if a Loopback Adapter Is Installed on Your Computer

To check if a loopback adapter is installed on your computer, run the `ipconfig /all` command:

```
DRIVE_LETTER:\>ipconfig /all
```

Note: Loopback Adapter installed on the computer should be made the Primary Network Adapter.

If there is a loopback adapter installed, you would see a section that lists the values for the loopback adapter. For example:

```
Ethernet adapter Local Area Connection 2:
Connection-specific DNS Suffix  . :
Description . . . . . . . . . . . : Microsoft Loopback Adapter
Physical Address. . . . . . . . . : 02-00-4C-4F-4F-50
DHCP Enabled. . . . . . . . . . . : No
IP Address. . . . . . . . . . . . : 10.10.10.10
Subnet Mask . . . . . . . . . . . : 255.255.0.0
```

2.6.4.2 Installing a Loopback Adapter on Windows Server 2003, Windows Server 2003 R2, or Windows XP

To install a loopback adapter on Windows 2003, Windows Server 2003 R2, or Windows XP:

1. Open the Windows Control Panel.

2. Double-click **Add Hardware** to start the Add Hardware wizard.

3. In the Welcome window, click **Next**.

4. In the Is the hardware connected? window, select **Yes, I have already connected the hardware**, and click **Next**.

5. In the The following hardware is already installed on your computer window, in the list of installed hardware, select **Add a new hardware device**, and click **Next**.

6. In the The wizard can help you install other hardware window, select **Install the hardware that I manually select from a list**, and click **Next**.

7. From the list of common hardware types, select **Network adapters**, and click **Next**.

8. In the Select Network Adapter window, make the following selections:

    ■ **Manufacturer**: Select **Microsoft**.

    ■ **Network Adapter**: Select **Microsoft Loopback Adapter**.

9. Click **Next**.

10. In the The wizard is ready to install your hardware window, click **Next**.

11. In the Completing the Add Hardware Wizard window, click **Finish**.

12. If you are using Windows 2003, restart your computer.

13. Right-click **My Network Places** on the desktop and choose **Properties**. This displays the Network Connections Control Panel item.

14. Right-click the connection that was just created. This is usually named "Local Area Connection 2". Choose **Properties**.

15. On the **General** tab, select **Internet Protocol (TCP/IP)**, and click **Properties**.

16. In the Properties dialog box, click **Use the following IP address** and do the following:

    a. **IP Address**: Enter a non-routable IP for the loopback adapter. Oracle recommends the following non-routable addresses:

        – `192.168.x.x` (*x* is any value between 0 and 255)

        – `10.10.10.10`

    b. **Subnet mask**: Enter `255.255.255.0`.

    c. Record the values you entered, which you need later in this procedure.

    d. Leave all other fields empty.

    e. Click **OK**.

17. Click **Close**.

18. Close **Network Connections**.

19. Restart the computer.

20. Add a line to the `DRIVE_LETTER:\ WINDOWS\system32\drivers\etc\hosts` file with the following format, after the `localhost` line:

```
IP_address    hostname.domainname    hostname
```

where:

- `IP_address` is the non-routable IP address you entered in step 16.

- `hostname` is the name of the computer.

- `domainname` is the name of the domain.

For example:

```
10.10.10.10    mycomputer.mydomain.com    mycomputer
```

21. Check the network configuration:

> **Note:** Domain name is optional.

    a. Open **System** in the Control Panel, and select the **Computer Name** tab. In Windows Vista and Windows Server 2008, the Computer Name tab is not available. In **Full computer name**, make sure you see the host name and the domain name, for example, `sales.us.example.com`.

    b. Click **Change**. In **Computer name**, you should see the host name, and in **Full computer name**, you should see the host name and domain name. Using the previous example, the host name would be `sales` and the domain would be `us.example.com`.

    c. Click **More**. In **Primary DNS suffix of this computer**, you should see the domain name, for example, `us.example.com`.

2.6.4.3 Installing a Loopback Adapter on Windows Vista and Windows Server 2008

To install a loopback adapter on Windows Vista or Windows Server 2008:

1. Open the Windows Control Panel.

2. Double-click **Add Hardware** to start the Add Hardware wizard.

3. In the Welcome window, click **Next**.

4. In the The wizard can help you install other hardware window, select **Install the hardware that I manually select from a list**, and click **Next**.

5. From the list of hardware types, select the type of hardware you are installing window, select **Network adapters**, and click **Next**.

6. In the Select Network Adapter window, make the following selections:

   - **Manufacturer**: Select **Microsoft**.

   - **Network Adapter**: Select **Microsoft Loopback Adapter**.

7. Click **Next**.

8. In the The wizard is ready to install your hardware window, click **Next**.

9. In the Completing the Add Hardware Wizard window, click **Finish**.

10. Go to step 12 of the previous section. The remaining steps are the same as given for Windows Vista.

2.6.4.4 Installing a Loopback Adapter on Windows 7 and Windows Server 2008 R2

To install a loopback adapter on Windows 7 and Windows Server 2008 R2:

1. Click **Start** and enter `hdwwiz` in the Search box.

2. Click **hdwwiz** to start the Add Hardware wizard.

3. Go to step 3 of "Installing a Loopback Adapter on Windows Server 2003, Windows Server 2003 R2, or Windows XP" on page 2-13. The remaining steps are the same as given for Windows XP.

2.6.4.5 Installing Microsoft KM-TEST Loopback Adapter on Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2

To install a loopback adapter on Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2:

1. Complete steps 1-5 of "Installing a Loopback Adapter on Windows Server 2003, Windows Server 2003 R2, or Windows XP" on page 2-13.

2. In the Select Network Adapter window, make the following selections:

   - **Manufacturer**: Select **Microsoft**.

   - **Network Adapter**: Select **Microsoft KM-TEST Loopback Adapter**.

   Then continue with the same steps as given for Windows Server 2008.

2.6.4.6 Removing a Loopback Adapter

To remove a loopback adapter:

1. Display **System** in the Windows Control Panel.

2. In the Hardware tab, click **Device Manager**. This tab is not available with Windows Vista and Windows Server 2008. Click **Device Manager** instead.

3. In the Device Manager window, expand **Network adapters**. You should see **Microsoft Loopback Adapter**.

4. Right-click **Microsoft Loopback Adapter** and select **Uninstall**.

5. Click **OK**.

6. Restart the computer.

7. Remove the line from the `DRIVE_LETTER:\WINDOWS\system32\drivers\etc\hosts` file, added after the localhost line while installing the loopback adapter on other Windows operating systems.

2.7 Individual Component Requirements

This section contains these topics:

- Configuring Disk Storage for Oracle Data Files and Recovery Files
- Creating Directories for Oracle Data Files or Recovery Files
- Oracle Database Security Strong Authentication Requirements
- Oracle Enterprise Manager Requirements
- Oracle-Managed Files Requirements
- Oracle Real Application Clusters (Oracle RAC)
- Oracle Volume Shadow Copy Service (VSS) Writer
- Preinstallation Requirement for Oracle Database Vault

> **See Also:**
>
> - Chapter 2, "Oracle Application Express Installation Requirements" and "Recommended Pre-installation Tasks" in *Oracle Application Express Installation Guide*
> - "Pre-installation Requirements" section in *Oracle Configuration Manager Installation and Administration Guide* and *Oracle Configuration Manager Prerequisites* for preinstallation requirements for Oracle Configuration Manager
> - Appendix A, "Country Codes", in *Oracle Configuration Manager Installation and Administration Guide* for a list of valid country codes that can be used while installing Oracle Configuration Manager.

2.7.1 Configuring Disk Storage for Oracle Data Files and Recovery Files

This section describes the storage options for storing Oracle data files and, optionally, Oracle database recovery files. After you choose the storage method to use for each file type, use the following sections to configure the required storage:

- Choosing a Storage Option for Oracle Data Files
- Choosing a Storage Option for Oracle Database Recovery Files
- Configuring Disk Storage

> **Note:** You do not have to use the same storage option for each file type.

2.7.1.1 Choosing a Storage Option for Oracle Data Files

If you want to create a database during the installation, you must choose one of the following storage options for the data files:

- File system

- Oracle Automatic Storage Management

The database files must be placed on Oracle ASM if using Oracle ACFS; otherwise they can be placed on NTFS.

2.7.1.2 Choosing a Storage Option for Oracle Database Recovery Files

If you want to enable automated backups during the installation, you must choose one of the following storage options for recovery files (the fast recovery area):

- File system

- Oracle Automatic Storage Management

The storage option that you choose for recovery files can be the same as or different to the option you choose for the data files. The recovery files must be placed on Oracle ASM if using Oracle ACFS; otherwise they can be placed on NTFS.

2.7.1.3 Configuring Disk Storage

For more information about these options, see the "Database Storage Options" section on page 1-12. For information about how to configure disk storage before you start the installation, see one of the following sections depending on your choice:

- To use a file system for database or recovery file storage, see the "Creating Directories for Oracle Data Files or Recovery Files" section on page 2-17.

- To use Oracle Automatic Storage Management for database or recovery file storage, see the "Preparing Disks for an Oracle Automatic Storage Management Installation" section on page 3-5.

2.7.2 Creating Directories for Oracle Data Files or Recovery Files

If you decide to place the Oracle database or recovery files on a file system, use the following guidelines when deciding where to place them:

- Guidelines for Placing Oracle Data Files on a File System

- Guidelines for Placing Oracle Recovery Files on a File System

- Creating Required Directories

2.7.2.1 Guidelines for Placing Oracle Data Files on a File System

- You can choose either a single file system or multiple file systems to store the data files:

  - If you want to use a single file system, then choose a file system on a physical device that is dedicated to the database.

    For best performance and reliability, choose a redundant array of independent disks (RAID) device or a logical volume on multiple physical devices and implement the stripe and mirror everything (SAME) methodology.

  - If you want to use multiple file systems, then choose file systems on separate physical devices that are dedicated to the database.

Select this method to distribute physical I/O and create separate control files on different devices for increased reliability. You must choose the Advanced database creation option during the installation to implement this method.

- If you intend to create a preconfigured database during the installation, then the file system (or file systems) that you choose must have at least 950 MB of free disk space.

  For production databases, you must estimate the disk space requirement depending how you plan to use database.

- For optimum performance, the file systems that you choose should be on physical devices that are used only by the database.

- The default location suggested by Oracle Universal Installer for the database file directory is a subdirectory of the Oracle base directory. However, this default location is not recommended for production databases.

2.7.2.2 Guidelines for Placing Oracle Recovery Files on a File System

> **Note:** You must choose a location for recovery files only if you intend to enable automated backups during the installation.

If you place the Oracle recovery files on a file system, use the following guidelines when deciding where to place them:

- To prevent disk failure from making both the data files and the recovery files unavailable, place the recovery files in a file system on a different physical disk from the data files.

  > **Note:** Alternatively, for both data files and recovery files, use an Oracle Automatic Storage Management disk group.

- The file system that you choose should have at least 2 GB of free disk space.

  The disk space requirement is the default disk quota configured for the fast recovery area (specified by the DB_RECOVERY_FILE_DEST_SIZE initialization parameter).

  If you choose the Advanced database configuration option, you can specify a different disk quota value. After you create the database, you can also use Oracle Enterprise Manager Grid Control or Database Control to specify a different value.

  > **See Also:** *Oracle Database Backup and Recovery User's Guide* for more information about the fast recovery area

- The default location suggested by Oracle Universal Installer for the database file directory is a subdirectory of the Oracle base directory. However, this default location is not recommended for production databases.

2.7.2.3 Creating Required Directories

> **Note:** You must complete this procedure only to place the Oracle database or recovery files on a separate file system from the Oracle base directory.

To create directories for the Oracle database or recovery files on separate file systems from the Oracle base directory, follow these steps:

1. Use Windows Explorer to determine the free disk space on the file system.

2. From the display, identify the file systems to use:

File Type	File System Requirements
Data files	Choose either: ■ A single file system with at least 950 MB of free disk space. ■ Two or more file systems with at least 950 MB of free disk space in total.
Recovery files	Choose a file system with at least 2 GB of free disk space.

If you are using the same file system for multiple types of files, then add the disk space requirements for each type to determine the total disk space requirement.

3. Note the names of the directories for the file systems that you identified.

4. If you also want to use Oracle Automatic Storage Management, see "Preparing Disks for an Oracle Automatic Storage Management Installation" on page 3-5 for instructions. Otherwise see the "Stopping Existing Oracle Services" section on page 2-19.

2.7.3 Stopping Existing Oracle Services

> **Note:** If you are installing additional Oracle Database 11*g* products in an existing Oracle home, then stop *all* processes running in the Oracle home. You must complete this task because you cannot overwrite files that are used by the running processes.

Consider the following before you install Oracle Grid Infrastructure or Oracle Database:

■ If you plan to use Oracle Restart, you must install the Oracle Grid Infrastructure before you install and create the database. When you perform a database installation, the database must use the same listener created during the Oracle Grid Infrastructure installation, thereafter you do not have to perform the steps listed in this section.

The default listener and any additional listeners must run from the Oracle Grid Infrastructure home.

■ If you have an existing Oracle Database 11*g* Release 2 (11.2) running on Oracle Automatic Storage Management, then stop any existing Oracle ASM instance. After you finish installing the Oracle Grid Infrastructure software, start the Oracle ASM instance again.

If you choose to create a database during the installation, then most installation types configure and start a default Oracle Net listener using TCP/IP port `1521` and the IPC key value `EXTPROC`. However, if an existing Oracle Net listener process is using the same port or key value, Oracle Universal Installer looks for the next available free port (for example, `1522`) and configures and starts the new listener on this available free port.

2.7.4 Oracle Database Security Strong Authentication Requirements

Ensure that you meet the hardware and software requirements so that you can use strong authentication (Kerberos, PKI) with Oracle Database.

2.7.5 Oracle Enterprise Manager Requirements

All Oracle Enterprise Manager products must belong to the same release. Older versions of Enterprise Manager are not supported with the new release.

> **Note:** All Oracle Enterprise Manager products, except Oracle Enterprise Manager Database Control, are released on the Enterprise Manager Grid Control installation media. Enterprise Manager Database Control is available on the Oracle Database installation media.

> **See Also:**
> - "Web Browser Support"
> - *Oracle Enterprise Manager Grid Control Basic Installation Guide*

2.7.6 Oracle-Managed Files Requirements

If you choose the Advanced database creation option, you can use the Oracle-managed files feature with the new database. If you use this feature, you need only specify the database object name instead of file names when creating or deleting database files. Configuration procedures are required to enable Oracle Managed Files.

> **See Also:** "Using Oracle-Managed Files" in *Oracle Database Administrator's Guide*

2.7.7 Oracle Real Application Clusters (Oracle RAC)

If you plan to install Oracle RAC or a grid computing environment, then you must first install Oracle Grid Infrastructure for a Cluster.

> **See Also:** *Oracle Real Application Clusters Installation Guide* and *Oracle Grid Infrastructure Installation Guide*, available on the Oracle Clusterware installation media

2.7.8 Oracle Volume Shadow Copy Service (VSS) Writer

Oracle Volume Shadow Copy Service Writer is supported on Windows Server operating systems. On Windows Server 2003 without Service Pack 1, you can have only one database on the system. With Service Pack 1 or higher, you can have multiple Oracle databases on the system.

> **See Also:** "Performing Database Backup and Recovery with VSS" in *Oracle Database Platform Guide for Microsoft Windows*

2.7.9 Preinstallation Requirement for Oracle Database Vault

If you want to install Oracle Database Vault, then set the `DB_BLOCK_SIZE` initialization parameter to 4096 or larger. If the value is less than 4096, then you cannot change it. The only way to change the `DB_BLOCK_SIZE` value is by re-creating the database.

> **See Also:** "Specifying Database Block Sizes" in *Oracle Database Administrator's Guide*

3

Oracle Grid Infrastructure for a Standalone Server

> **Note:** Oracle Grid Infrastructure is available only on 64-bit Windows.

The Oracle Grid Infrastructure for a standalone server is the Oracle software that provides system support for an Oracle database including volume management, file system, and automatic restart capabilities. If you plan to use Oracle Restart or Oracle Automatic Storage Management, then you must install Oracle Grid Infrastructure before you install and create the database. Oracle Grid Infrastructure for a standalone server is the software that includes Oracle Restart and Oracle Automatic Storage Management. Oracle combines the two infrastructure products into a single set of binaries that is installed as the Oracle Grid Infrastructure home.

Oracle Automatic Storage Management is a volume manager and a file system for Oracle database files that supports single-instance Oracle Database and Oracle Real Application Clusters (Oracle RAC) configurations. Oracle Automatic Storage Management also supports a general-purpose file system for your application needs, including Oracle Database binaries. Oracle Automatic Storage Management is Oracle's recommended storage management solution that provides an alternative to conventional volume managers, file systems, and raw devices.

Oracle Restart improves the availability of your Oracle database because of the following:

- When a hardware or a software failure occurs, Oracle Restart automatically starts all Oracle components, including the Oracle database instance, Oracle Net Listener, database services, and Oracle Automatic Storage Management.

- Oracle Restart starts components in the proper order when the database host is restarted.

- Oracle Restart runs periodic checks to monitor the health of Oracle components. If a check operation fails for a component, then the component is shut down and restarted.

> **Note:**
>
> - If you want to use Oracle Automatic Storage Management or Oracle Restart, then you must install Oracle Grid Infrastructure for a standalone server before you install and create the database. Otherwise, you must manually register the database with Oracle Restart.
>
> - Oracle Restart is used in single-instance (nonclustered) environments only.

This chapter contains the following sections:

- Requirements for Oracle Grid Infrastructure Installation
- Oracle ACFS and Oracle ADVM Support
- Managing Disk Groups for Older Database Versions
- Upgrading Existing Oracle Automatic Storage Management Instances
- Oracle Automatic Storage Management Installation Considerations
- Preparing Disks for an Oracle Automatic Storage Management Installation
- Installing Oracle Grid Infrastructure Using a Software-Only Installation
- Installing and Configuring the Oracle Grid Infrastructure for a Standalone Server
- Modifying Oracle Grid Infrastructure Binaries After Installation
- Manually Configuring Oracle Automatic Storage Management Disk Groups
- Testing the Oracle Automatic Storage Management Installation

3.1 Requirements for Oracle Grid Infrastructure Installation

Before you install Oracle Grid Infrastructure, ensure that your system meets the following requirements:

- Memory Requirements
- Disk Space Requirements

3.1.1 Memory Requirements

At least 1 GB of RAM (for Oracle Grid Infrastructure for a Standalone Server installations, including installations where you plan to install Oracle Database).

3.1.2 Disk Space Requirements

The following are the disk space requirements for installing Oracle Grid Infrastructure:

At least 2.2 GB of disk space

The amount of disk space available in the %TEMP% directory is equivalent to the total amount of free disk space, minus what is required for Oracle Grid Infrastructure to be installed.

If less than 1 GB free disk space is available in the %TEMP% directory, then complete the following steps:

- Delete unnecessary files from the %TEMP% directory to meet the disk space requirement.

- Set `TEMP` environment variable. Go to System Properties, then Environment Variables , "TEMP=C:\Temp\"

If you plan to install Oracle Database, then you must meet additional preinstallation requirements. See Chapter 2, "Oracle Database Preinstallation Requirements."

3.2 Oracle ACFS and Oracle ADVM Support

Oracle Automatic Storage Management Cluster File System (Oracle ACFS) extends Oracle Automatic Storage Management technology to support of all of your application data in both single host and cluster configurations. Oracle Automatic Storage Management Dynamic Volume Manager (Oracle ADVM) provides volume management services and a standard disk device driver interface to clients. Oracle Automatic Storage Management Cluster File System is layered on Oracle Automatic Storage Management through the Oracle Automatic Storage Management Dynamic Volume Manager interface.

For Oracle ASM 11*g* Release 2 (11.2.0.1), Oracle ACFS and Oracle ADVM are supported only on Windows Server 2003 64-bit and Windows Server 2003 R2 64-bit. Starting with Oracle ASM 11*g* Release 2 (11.2.0.2), Oracle ACFS and Oracle ADVM are also supported on Windows Server 2008, x64 and Windows Server 2008 R2, x64.

Table 3–1 Platforms That Support Oracle ACFS and Oracle ADVM

Release	Platform / Operating System
11.2.0.1 and later	Windows Server 2003 64-bit and Windows Server 2003 R2 64-bit
11.2.0.2 and later	Windows Server 2008 64-bit and Windows Server 2008 R2 64-bit
11.2.0.3 and later	Windows Server 2008 64-bit and Windows Server 2008 R2 64-bit

> **See Also:** For current information on platforms and releases that support Oracle ACFS and Oracle ADVM refer to My Oracle Support Note 1369107.1 at:
>
> https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=1369107.1

> **Note:** Oracle recommends that Oracle data files are installed in Oracle ASM disk groups. Installing Oracle data files on an Oracle ACFS file system is not supported. Oracle ACFS can be used as an option only when Oracle Automatic Storage Management is configured.

> **See Also:**
>
> - *Oracle Database Release Notes for Microsoft Windows* for latest information about supported platforms and releases
>
> - *Oracle Automatic Storage Management Administrator's Guide* for more information about Oracle Automatic Storage Management Cluster File System and Oracle Automatic Storage Management Dynamic Volume Manager

Oracle ACFS resources are not supported for Oracle Restart configurations on all platforms. You must manually load ACFS drivers after a system restart.

Oracle Database homes can be stored on Oracle ACFS only if the database version is Oracle Database 11*g* Release 2 or higher. Earlier releases of Oracle Database cannot be installed on Oracle ACFS.

3.3 Managing Disk Groups for Older Database Versions

Use Oracle ASM Configuration Assistant (Oracle ASMCA) to create and modify disk groups when you install earlier version of Oracle databases on Oracle Grid Infrastructure installations.

Releases before Oracle Database 11*g* Release 2 used Database Configuration Assistant to perform administrative tasks on Oracle ASM. Starting with 11*g* Release 2 (11.2), Oracle ASM is installed with Oracle Restart. You can no longer use Oracle DBCA to perform administrative tasks on Oracle ASM.

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for details about configuring disk group compatibility for databases using Oracle Database 11*g*.

3.4 Upgrading Existing Oracle Automatic Storage Management Instances

If you have an Oracle Automatic Storage Management installation from a previous release installed on your server, or in an existing Oracle Grid Infrastructure installation, you can use Oracle Automatic Storage Management Configuration Assistant to upgrade the existing Oracle Automatic Storage Management instance to 11*g* Release 2 (11.2), and subsequently configure disk groups, Oracle Automatic Storage Management volumes and Oracle Automatic Storage Management file systems.

> **Note:** You must first shut down all databases and applications using an existing Oracle Automatic Storage Management instance before upgrading it.

During installation, if you chose to use Oracle Automatic Storage Management and Oracle Automatic Storage Management Configuration Assistant detects that there is an earlier Oracle Automatic Storage Management version installed in another Oracle Automatic Storage Management home, then after installing the Oracle Automatic Storage Management 11*g* Release 2 (11.2) binaries, you can start Oracle Automatic Storage Management Configuration Assistant to upgrade the existing Oracle Automatic Storage Management instance.

3.5 Oracle Automatic Storage Management Installation Considerations

In previous releases, Oracle Automatic Storage Management (Oracle ASM) was installed as part of the Oracle Database installation. With Oracle Database 11*g* Release 2 (11.2), Oracle Automatic Storage Management is part of an Oracle Grid Infrastructure installation, either for a cluster, or for a standalone server.

If you want to upgrade an existing Oracle Automatic Storage Management installation, then you must upgrade Oracle Automatic Storage Management by running an Oracle Grid Infrastructure upgrade (upgrades of existing Oracle Automatic Storage Management installations). If you do not have Oracle Automatic Storage

Management installed and you want to use Oracle Automatic Storage Management as your storage option, then you must complete an Oracle Grid Infrastructure installation before you start your Oracle Database installation.

You must run Oracle Automatic Storage Management Configuration Assistant for installing and configuring Oracle ASM instances, disk groups, volumes, and Oracle Automatic Storage Management Cluster File System (Oracle ACFS). In addition, you can use the ASMCA command-line interface.

> **See Also:** Chapter 11, "Oracle ASM Configuration Assistant" in *Oracle Automatic Storage Management Administrator's Guide* for information about Oracle ASMCA

Apply the following guidelines when you install Oracle Automatic Storage Management:

- You must complete the steps listed under the "Preparing Disks for an Oracle Automatic Storage Management Installation" section to prepare a disk partition to use for the Oracle Automatic Storage Management disk groups.

- Ensure that at least one disk is configured appropriately in an Oracle ASM disk group before beginning the installation.

- When you install Oracle Automatic Storage Management, Oracle Automatic Storage Management Configuration Assistant creates a separate server parameter file (`SPFILE`) and password file for the Oracle Automatic Storage Management instance. As soon as Oracle Automatic Storage Management is installed, `ASMSNMP` schema and user are created. See *Oracle Automatic Storage Management Administrator's Guide* for more information.

- The Oracle Automatic Storage Management instance that manages the existing disk group runs in the Oracle Grid Infrastructure Oracle home directory.

3.6 Preparing Disks for an Oracle Automatic Storage Management Installation

If you plan to use Oracle Automatic Storage Management to manage database files for your databases, then use the procedures in this section to prepare disk groups before you install an Oracle Automatic Storage Management instance.

This section covers the following topics:

- General Steps for Configuring Oracle Automatic Storage Management

- Step 1: Identifying Storage Requirements for Oracle Automatic Storage Management

- Step 2: Creating DAS or SAN Disk Partitions for an Oracle Automatic Storage Management Instance

- Step 3: Manually Configuring Disks for Oracle Automatic Storage Management

> **Note:** Oracle does not recommend using identifiers for database object names that must be quoted. While these quoted identifiers may be valid as names in the `SQL CREATE` statement, such as `CREATE DISKGROUP "1data" ...`, the names may not be valid when using other tools that manage the database object.

3.6.1 General Steps for Configuring Oracle Automatic Storage Management

The following are the general steps to configure Oracle Automatic Storage Management:

1. Identify your site's storage requirements.

2. If you are creating a new Oracle Automatic Storage Management disk group, create partitions for direct attached storage (DAS) or storage area network (SAN) disks.

3. Use `asmtool` to stamp the disks before using them for Oracle Automatic Storage Management.

   > **See Also:** "Step 3: Manually Configuring Disks for Oracle Automatic Storage Management" on page 3-11 for more information about stamping the disks

4. Configure the disks for use with Oracle Automatic Storage Management. You must provide the Oracle Automatic Storage Management disk configuration information during the Oracle Grid Infrastructure installation.

3.6.2 Step 1: Identifying Storage Requirements for Oracle Automatic Storage Management

To identify the storage requirements for using Oracle Automatic Storage Management, you must determine how many devices and the amount of free disk space that you require. To complete this task, follow these steps:

1. Determine whether you want to use Oracle Automatic Storage Management for Oracle data files, recovery files, or both.

   > **Note:** You do not have to use the same storage mechanism for Oracle Database files and recovery files. You can use a file system for one file type and Oracle Automatic Storage Management for the other.
   >
   > If you choose to enable automated backups and you do not have a shared file system, then you must choose Oracle Automatic Storage Management for recovery file storage.

   During the database installation, if you plan to enable automated backups, then you can choose Oracle Automatic Storage Management as the storage mechanism for recovery files by specifying an Oracle Automatic Storage Management disk group for the fast recovery area. Depending how you choose to create a database during the installation, you have the following options:

   - You can run Oracle Automatic Storage Management Configuration Assistant in interactive mode to create and configure the required disk groups.

     During the database installation, if you select an installation method that runs Database Configuration Assistant in interactive mode (Advanced Installation type), then you select the disk groups that you created using Oracle ASMCA.

     You have the option to use the disk groups you created using Oracle ASMCA both for database files and recovery files, or you can choose to use different disk groups for each file type. Ideally, you should create separate Oracle Automatic Storage Management disk groups for data files and for recovery files.

- If you run Oracle ASMCA in noninteractive mode, then you must use the same Oracle Automatic Storage Management disk group for data files and recovery files. During the database installation (Typical Install type), you select the same disk group for both data files and recovery files.

   See Also:

   - "Oracle ASM Configuration Assistant Command-Line Interface" section in *Oracle Automatic Storage Management Administrator's Guide*

   - "Creating a Fast Recovery Area Disk Group"

2. Choose the Oracle Automatic Storage Management redundancy level for each Oracle Automatic Storage Management disk group you create.

   The redundancy level that you choose for the Oracle Automatic Storage Management disk group determines how Oracle Automatic Storage Management mirrors files in the disk group and determines the number of disks and amount of disk space that you require. The redundancy levels are as follows:

   - External redundancy

      An external redundancy disk group requires a minimum of one disk device. The effective disk space in an external redundancy disk group is the sum of the disk space in all of its devices.

      Because Oracle Automatic Storage Management does not mirror data in an external redundancy disk group, Oracle recommends that you use only RAID or similar devices that provide their own data protection mechanisms as disk devices in this type of disk group.

   - Normal redundancy

      To optimize performance and reliability in a normal redundancy disk group, Oracle Automatic Storage Management uses two-way mirroring for data files and three-way mirroring for control files, by default. In addition, you can choose the mirroring characteristics for individual files in a disk group. Alternatively, you can use two-way mirroring or no mirroring.

      A normal redundancy disk group requires a minimum of two failure groups (or two disk devices) if you are using two-way mirroring. The effective disk space in a normal redundancy disk group is *half* the sum of the disk space in all of its devices.

      For most installations, Oracle recommends that you use normal redundancy disk groups.

   - High redundancy

      In a high redundancy disk group, Oracle Automatic Storage Management uses three-way mirroring to increase performance and provide the highest level of reliability. A high redundancy disk group requires a minimum of three disk devices (or three failure groups). The effective disk space in a high redundancy disk group is *one-third* the sum of the disk space in all of its devices.

      While high redundancy disk groups do provide a high level of data protection, you must consider the higher cost of additional storage devices before deciding to use this redundancy level.

3. Determine the total amount of disk space that you require for the data files and recovery files.

Use the following table to determine the minimum number of disks and the minimum disk space requirements for the installation:

Redundancy Level	Minimum Number of Disks	Data Files	Recovery Files	Both File Types
External	1	1.6 GB	2.95 GB	4.55 GB
Normal	2	3.2 GB	5.90 GB	9.10 GB
High	3	4.8 GB	8.85 GB	13.65 GB

If an Oracle Automatic Storage Management instance is on the system, you can use an existing disk group to meet these storage requirements. If necessary, you can add disks to an existing disk group during the database installation.

4. Optionally identify failure groups for the Oracle Automatic Storage Management disk group devices.

> **Note:** You must complete this step only if you intend to use an installation method that runs Oracle Automatic Storage Management Configuration Assistant in interactive mode, for example, if you intend to choose the Advanced database configuration option. Other installation types do not allow you to specify failure groups.

If you intend to use a normal or high redundancy disk group, you can further protect your database against hardware failure by associating a set of disk devices in a custom failure group. By default, each device comprises its own failure group. However, if two disk devices in a normal redundancy disk group are attached to the same SCSI controller, the disk group becomes unavailable if the controller fails. The controller in this example is a single point of failure.

For instance, to avoid failures of this type, you could use two SCSI controllers, each with two disks, and define a failure group for the disks attached to each controller. This configuration would enable the disk group to tolerate the failure of one SCSI controller.

> **Note:** If you define custom failure groups, you must specify a minimum of two failure groups for normal redundancy disk groups and three failure groups for high redundancy disk groups.

5. If you are sure that a suitable disk group does not exist on the system, install or identify appropriate disk devices to add to a new disk group. Use the following guidelines when identifying appropriate disk devices:

   ■ All of the devices in an Oracle Automatic Storage Management disk group should be the same size and have the same performance characteristics.

   ■ Do not specify multiple partitions on a single physical disk as a disk group device. Oracle Automatic Storage Management expects each disk group device to be on a separate physical disk.

   ■ Although you can specify a logical volume as a device in an Oracle Automatic Storage Management disk group, Oracle does not recommend their use. Logical volume managers can hide the physical disk architecture, preventing

Oracle Automatic Storage Management from optimizing I/O across the physical devices.

> **See Also:** "Step 3: Manually Configuring Disks for Oracle Automatic Storage Management" on page 3-11 for information about completing this task

3.6.3 Step 2: Creating DAS or SAN Disk Partitions for an Oracle Automatic Storage Management Instance

In order to use a DAS or SAN disk in Oracle Automatic Storage Management, the disk must have a partition table. Oracle recommends creating exactly one partition for each disk containing the entire disk.

> **Note:** You can use any physical disk for Oracle Automatic Storage Management, if it is partitioned. However, you cannot use NAS or Microsoft dynamic disks.

This section covers the following topics.

- Step 1: Enabling Disk Automounting
- Step 2: Creating the Disk Partitions

Step 1: Enabling Disk Automounting

Before you can configure partitions or logical drives on Windows, you must enable disk automounting. Enable disk automounting when using:

- Disk partitions on both single-instance and Oracle RAC installations
- Cluster file system for Oracle RAC
- Oracle Clusterware
- Raw partitions for a single-node database installation
- Primary or logical partitions for Oracle Automatic Storage Management

To enable automounting:

1. Enter the following commands at a command prompt:

   ```
   DRIVE_LETTER:\> diskpart
   DISKPART> automount enable
   DISKPART> exit
   ```

2. Restart your computer.

Step 2: Creating the Disk Partitions

To create disk partitions, use the disk administration tools provided by the operating system or third party vendors. The following administration tools are provided by the operating system:

- The graphical user interface Disk Management snap-in to manage disks.

  To access this tool, type diskmgmt.msc at the command prompt. Alternatively, from the **Start** menu, select **Programs**, then **Administrative Tools**, then **Computer Management**. Then select the **Disk Management** node in the Storage tree.

On Windows Vista, Windows 7, Windows Server 2008, Windows Server 2008 R2, Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2, create primary partitions and logical drives in extended partitions by selecting the **New Simple Volume** option. To create a raw device, assign a drive letter and remove the letter after the partition is created. For other Windows, you must not assign the drive letter. You must select **Do not format this partition** to specify raw partition. Do not use spanned volumes or striped volumes. These options convert the volume to a dynamic disk. Oracle Automatic Storage Management does not support dynamic disks.

For other Windows, create primary partitions by selecting the **New Partition** option. Create the logical drives by selecting the **New Logical Drive** option.

- The command-line tool `diskpart.exe`, which lets you create primary partitions, extended partitions, and logical drives.

  To access this tool, enter `diskpart.exe` at the command prompt. The syntax for using `diskpart.exe` for the procedures in this section is as follows:

  ```
  DRIVE_LETTER:\> diskpart
  DISKPART> select disk diskn
  DISKPART> create partition primary | extended | logical size=sizen
  DISKPART>
  ```

  where:

  - `diskpart.exe` is the command-line tool for managing disks.

  - `diskn` is the disk number where the partitions are created.

  - `sizen` is the size of the partition, for example 500 represents 500 MB.

    See Also: The online help or documentation for the administration tool you are using

You can enter the `diskpart.exe` commands directly at the command line; alternatively, you can enter the commands in a text file, and then run `diskpart /s` using this file as a script.

You cannot create more than four primary disk partitions per disk. If you need more, you can get around this limitation by creating three primary partitions and then creating the fourth partition as an extended partition with as many logical partitions within as you need.

For example, on Windows x86-based systems, to create the disk partitions on Disk 5 and assign them each a size:

```
DISKPART> select disk 5
DISKPART> create partition primary size=500
DISKPART> ...
DISKPART> create partition extended
DISKPART> create partition logical size=800
DISKPART> ...
DISKPART> create partition logical size=500

DISKPART> select disk 5
DISKPART> create partition primary size=500
DISKPART> ...
DISKPART> create partition primary size=800
```

If you prefer to use logical drives, you can create an extended partition and then assign the logical drives within it. For example:

```
DISKPART> create partition extended
DISKPART> create partition logical size=500
DISKPART> create partition logical size=700
```

3.6.4 Step 3: Manually Configuring Disks for Oracle Automatic Storage Management

To use Oracle Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN), the disks must be stamped with a header. If you install Oracle Grid Infrastructure in interactive mode, Oracle Universal Installer configures the disks' headers during the installation process. However, if you plan to install Oracle Grid Infrastructure in response file mode, you must manually configure the disks before installation by using either `asmtoolg` (GUI version) or `asmtool` (command-line version). You can also use these tools to reconfigure the disks later on after installation. The `asmtoolg` and `asmtool` utilities only work on partitioned disks—you cannot use Oracle Automatic Storage Management on unpartitioned disks.

The `asmtoolg` and `asmtool` tools associate meaningful, persistent names with disks to facilitate using those disks with Oracle Automatic Storage Management. Oracle Automatic Storage Management uses disk strings to more easily operate on groups of disks at once, so the names that `asmtoolg` or `asmtool` creates make this easier than using Windows drive letters.

All disk names created by `asmtoolg` or `asmtool` begin with the prefix `ORCLDISK` followed by a user-defined prefix (the default is `DATA`) and a disk number for identification purposes.

Using the asmtoolg Tool (Graphical User Interface)

The `asmtoolg` tool is a graphical interface for creating device names. Use `asmtoolg` to add, change, delete, and examine the devices available for use in Oracle Automatic Storage Management.

To add or change disk stamps:

1. In the installation media labeled Oracle Grid Infrastructure 11*g* Release 2 (11.2), from the media root, go to `asmtool` directory and double-click `asmtoolg.exe`.

    If Oracle Database is installed, go to *ORACLE_HOME*\bin and double-click `asmtoolg.exe`.

    On Windows Vista, Windows Server 2008, Windows Server 2008 R2, Windows 7, Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2, if User Account Control is enabled, create a shortcut for the command prompt window on your desktop. An icon for that shortcut appears on the desktop. Right click the icon for the newly created shortcut, and specify "Run as administrator." When the command window opens, go to *ORACLE_HOME*\bin, and then type `asmtoolg`.

2. Select the **Add or change label** option, then click **Next**.

    The `asmtoolg` tool shows the devices available on the system. Unrecognized disks are labeled as "Candidate device", stamped Oracle Automatic Storage Management disks as "Stamped ASM disk", and unstamped Oracle Automatic Storage Management disks as "Unstamped ASM disks." The tool also shows disks that are recognized by Windows as a file system (such as NTFS). These are not available for use as disks and cannot be selected. In addition, Microsoft Dynamic disks are not available for use as Oracle Automatic Storage Management disks.

    If necessary, follow the steps under "Step 2: Creating DAS or SAN Disk Partitions for an Oracle Automatic Storage Management Instance" on page 3-9 to create a disk partition for the Oracle Automatic Storage Management instance.

3. In the Stamp Disks window, select the disks to stamp.

   Oracle Automatic Storage Management can generate unique stamps for all of the devices selected for a given prefix. The stamps are generated by concatenating a number with the prefix specified. For example, if the prefix is DATA, then the first Oracle Automatic Storage Management link name is ORCLDISKDATA0.

   You can also specify the stamps of individual devices.

4. Optionally, select a disk to edit the individual stamp (Oracle Automatic Storage Management link name).

5. Click **Next**.

6. Click **Finish**.

To delete disk stamps:

1. Select the **Delete labels** option, then click **Next**.

   The delete option is only available if disks exist with stamps. The delete window shows all stamped Oracle Automatic Storage Management disks.

2. In the Delete Stamps window, select the disks to unstamp.

3. Click **Next**.

4. Click **Finish**.

Using the asmtool Utility (Command Line)

The asmtool utility is a command-line interface for stamping disks. On Windows Vista and Windows Server 2008, if User Account Control is enabled, then you can create a shortcut for the command prompt window on your desktop. An icon for that shortcut appears on the desktop. Right-click the icon for the newly created shortcut, and specify "Run as administrator." Then start asmtool.

It has the following options:

Option	Description
-add	Adds or changes stamps. You must specify the hard disk, partition, and new stamp name. If the disk is a raw device or has an existing Oracle Automatic Storage Management stamp, then you must specify the -force option. Also sets Oracle Automatic Storage Management instances to rescan the available disks.
	If you must partition a disk, then follow the procedures under "Step 2: Creating DAS or SAN Disk Partitions for an Oracle Automatic Storage Management Instance" on page 3-9.
	Example:

	`asmtool -add [-force]`
	`\Device\Harddisk1\Partition1 ORCLDISKASM0`
	`\Device\Harddisk2\Partition1 ORCLDISKASM2...`

Option	Description
-addprefix	Adds or changes stamps using a common prefix to generate stamps automatically. The stamps are generated by concatenating a number with the prefix specified. If the disk is a raw device or has an existing Oracle Automatic Storage Management stamp, then you must specify the -force option. Also sets Oracle Automatic Storage Management instances to rescan the available disks.
	Example:
| | ```
asmtool -addprefix ORCLDISKASM [-force]
\Device\Harddisk1\Partition1
\Device\Harddisk2\Partition1...
``` |
| -list | List available disks. The stamp, windows device name, and disk size in megabytes are shown. Some disks may be file systems, and cannot be stamped. If the disk is a raw device or has an existing Oracle Automatic Storage Management stamp, then you must specify the -force option. |
| | Example: |
| | ```
asmtool -list [-force]
``` |
| -delete | Removes existing stamps from disks. Also sets Oracle Automatic Storage Management instances to rescan the available disks. |
| | Example: |
| | ```
asmtool -delete ORCLDISKASM0 ORCLDISKASM1...
``` |

3.7 Installing Oracle Grid Infrastructure Using a Software-Only Installation

A software-only installation only copies the Oracle Grid Infrastructure for a Standalone Server binaries to the specified location. Configuring Oracle Grid Infrastructure for a Standalone Server and Oracle ASM must be done manually after the installation has finished.

When you perform a software-only installation of Oracle Grid Infrastructure software, you must complete a few manual configuration steps to enable Oracle Restart after you install the software.

> **Note:** Oracle recommends that only advanced users perform the software-only installation, because this installation method provides no validation of the installation and this installation option requires manual postinstallation steps to enable the Oracle Grid Infrastructure software.

Performing a software-only installation involves the following steps:

1. Installing the Software Binaries

2. Configuring the Software Binaries

3.7.1 Installing the Software Binaries

1. Log in to Windows using a member of the Administrators group and run the setup.exe command from the Oracle Database 11*g* Release 2 (11.2) installation media.

2. Complete a software-only installation of Oracle Grid Infrastructure.

   See "Configuring the Software Binaries" on page 14 for information about configuring Oracle Grid Infrastructure after performing a software-only installation.

3. Verify that the server meets the installation requirements using the command `runcluvfy.bat stage -pre hacfg`. Ensure that you have completed all storage and server preinstallation requirements.

3.7.2 Configuring the Software Binaries

To configure and activate a software-only Oracle Grid Infrastructure installation for Oracle Restart, complete the following tasks:

1. Log in as a member of the Administrators group and run the `roothas.pl` script from the *Grid_home*, using the following syntax:

   ```
   Grid_home\perl\bin\perl -IGrid_home\perl\lib -IGrid_home\crs\install
   Grid_home\crs\install\roothas.pl
   ```

   For example, if your Grid home is `C:\app\oracle\product\11.2.0\grid`, then run the following script:

   ```
   C:\app\oracle\product\11.2.0\grid\perl\bin\perl -I
   C:\app\oracle\product\11.2.0\grid\perl\lib -I C:\app
   \oracle\product\11.2.0\grid\crs\install
   C:\app\oracle\product\11.2.0\grid\crs\install\roothas.pl
   ```

2. Change directory to *Grid_home*`\oui\bin`, where *Grid_home* is the path of the Oracle Grid Infrastructure home.

3. Enter the following command syntax, where *Grid_home* is the path of the Oracle Grid Infrastructure home:

   ```
   setup.exe -updateNodeList ORACLE_HOME=Grid_home
   CLUSTER_NODES= CRS=TRUE
   ```

   For example:

   ```
   C:\app\oracle\product\11.2.0\grid> setup.exe -updateNodeList ORACLE_
   HOME=C:\app\oracle\product\11.2.0\grid
   CLUSTER_NODES= CRS=TRUE
   ```

4. Use the `SRVCTL` utility along with Network Configuration Assistant and Oracle Automatic Storage Management Configuration Assistant to add the listener, the Oracle Automatic Storage Management instance, and all Oracle Automatic Storage Management disk groups to the Oracle Restart configuration.

3.8 Installing and Configuring the Oracle Grid Infrastructure for a Standalone Server

If you install Oracle Restart and then create your database, the database is automatically added to the Oracle Restart configuration, and is then automatically restarted when required. However, if you install Oracle Restart on a host computer on which a database exists, you must manually add the database, the listener, the Oracle Automatic Storage Management (Oracle ASM) instance, and other components to the Oracle Restart configuration.

> **Note:** Oracle Restart can accommodate multiple single-instance databases on a single host computer.

This section covers the following topics:

- Installing Oracle Grid Infrastructure with a New Database Installation
- Installing Oracle Grid Infrastructure for an Existing Database

3.8.1 Installing Oracle Grid Infrastructure with a New Database Installation

Perform the following steps to install the Oracle Grid Infrastructure for a standalone server and then create a database that is managed by Oracle Restart. First install Oracle Grid Infrastructure, which installs Oracle Restart and Oracle Automatic Storage Management, then configure Oracle Automatic Storage Management with at least one disk group, and then install Oracle database that stores database files in Oracle Automatic Storage Management disk groups. Click the help button on the Oracle Universal Installer page for page level assistance.

To install Oracle Grid Infrastructure for a standalone server with a new database installation:

1. Double-click `setup.exe` to start Oracle Universal Installer.

   > **Note:** You must install Oracle Grid Infrastructure for a standalone server from the Oracle Grid Infrastructure media.

   Downloading Updates Before Installation

   Starting with Oracle Database 11*g* Release 2 (11.2.0.2), if you plan to run the installation in a secured data center, then you can download updates before starting the installation by starting Oracle Universal Installer on a system that has Internet access in update download mode. To start Oracle Universal Installer to download updates before installation, enter the following command:

   ```
   setup.exe -downloadUpdates
   ```

   Provide the My Oracle Support user name and password, and provide proxy settings if needed. After you download updates, transfer the update file to a directory on the server where you plan to run the installation.

   > **See Also:**
   >
   > - *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about response file formats
   > - "Software Updates Option" on page 1-10

   > **Note:** Start Oracle Universal Installer from the terminal session where you logged in as the Oracle Grid Infrastructure software owner user and set the user's environment.

2. Starting with Oracle Database 11*g* Release 2 (11.2.0.2), you can use the Software Updates feature to dynamically download and apply latest updates. After starting

Oracle Universal Installer, in the Download Software Updates screen, select one of the following options and click **Next:**

- Use My Oracle Support credentials for download: Select this option to download and apply the latest software updates.

   Click **Proxy Settings** to configure a proxy for Oracle Universal Installer to use to connect to the Internet. Provide the proxy server information for your site, along with a user account that has access to the local area network through which the server is connecting. Starting with Oracle Database 11*g* Release 2 (11.2.0.3) you can enter the Proxy Realm information. The proxy realm information is case-sensitive. If you do not have a proxy realm, then you do not need to provide an entry for the Proxy Username, Proxy Password, and Proxy Realm fields.

   Click **Test Connection** to ensure that your proxy settings are correctly entered, and the installer can download the updates.

- Use pre-downloaded software updates: Select this option to apply the software updates previously downloaded using the -downloadUpdates flag.

- Skip software updates: Select this option if you do not want to apply any updates.

3. The Apply Software Updates screen is displayed if you select to download the software updates or provide the pre-downloaded software updates location.

   a. If you selected Use My Oracle Support credentials for download in the previous screen, select **Download and apply all updates**, and then click **Next** to apply the updates.

   By default, the download location for software updates is placed in the home directory of the Oracle installation owner you are using to run this installation. If you choose to download the software updates in another location, then click **Browse** and select a different location on your server.

   b. If you selected Use pre-downloaded software updates in the previous screen, select **Apply all updates**, and then click **Next** to apply the updates downloaded before starting the installation.

4. The Select Installation Option screen appears. Select the **Configure Oracle Grid Infrastructure for a Standalone Server** option, to install and configure Oracle Restart and Oracle Automatic Storage Management. Click **Next**.

5. On the Select Product Languages screen, select one or more languages. Move the languages from the Available Languages list to the Selected Languages list. Click **Next**.

6. Create ASM Disk Group screen lists all the stamped disks matching the default pattern, \\.\ORCLDISK. After you have created the disk partitions, the disks must be stamped with a header before they can be used by Oracle ASM. Click **Stamp Disk**.

   Click **Change Discovery Path** to select any devices for use by Oracle Automatic Storage Management but are not listed. In the Change Discovery Path window, enter a string to use to search for devices that Oracle Automatic Storage Management uses, such as \\.\ORCLDISK*, and then click **OK**.

   The Disk Group Name default is DATA. You can enter a new name for the disk group, or use the default name.

   Check with your system administrator to determine if the disks used by Oracle Automatic Storage Management are mirrored at the storage level. If so, select

External for the redundancy. If the disks are not mirrored at the storage level, then select **Normal** for the redundancy.

> **Note:** For normal redundancy, you require twice as much disk space to hold the same amount of data. For example, if your database is 100 GB, then you approximately require 200 GB of storage.

Every Oracle ASM disk is divided into allocation units (AU). An allocation unit is the fundamental unit of allocation within a disk group. Starting with Oracle Database 11*g* Release 2 (11.2.0.4), you can select the AU Size value from 1, 2, 4, 8, 16, 32, or 64 MB, depending on the specific disk group compatibility level. The default value is set to 1 MB.

7. In the Specify ASM Password screen, enter the password required to connect to the Oracle ASM instance. The Oracle Automatic Storage Management instance is managed by a privileged role called SYSASM, which grants full access to Oracle Automatic Storage Management disk groups. Oracle recommends that you create a less privileged user, ASMSNMP, with SYSDBA privileges to monitor the Oracle Automatic Storage Management instance.

   Enter password for the SYSASM and ASMSNMP user accounts. The passwords should be at least eight characters in length and include at least one alphabetic and one numeric character.

   Optionally, you can use the same password for all accounts. However, Oracle recommends that you specify a different password for each account. You must remember the passwords that you specify.

8. On the Specify Installation Location screen, enter the following details and click **Next**:

   - **Oracle base:** Enter the directory location for Oracle base. Do not include spaces in the path name.

   - **Software Location:** This field is populated by default in concurrence with Oracle base location. Do not include spaces in the path name.

9. Perform Prerequisite Checks screen, checks if the minimum system requirements are met to perform the database installation. If all the system requirements are met, then you are directed to the Summary screen. However, in a failed installation, you can review the error.

   To get a failed requirements list, click **Show Failed**. Click **Fix & Check Again**, if you want the installer to fix the problem and check the system requirements once more. If you click **Check Again**, then you can run the prerequisite check again to see if the minimum requirements are met to carry on with the database installation.

   To get a list of failed requirements, select **Show Failed** from the list. To get a list of all the prerequirement checks run by the OUI, select **Show All**. To get a list of the prerequirement checks that are successful, select **Show Succeeded.**

> **Note:**
>
> - The Fix & Check Again option generates a script that sets some system parameters to Oracle-recommended values. Oracle recommends that you do not modify the contents of this script.
>
> - Oracle recommends that you use caution in checking the **Ignore All** option. If you check this option, then Oracle Universal Installer may not confirm that your system can install Oracle Database successfully.

10. Review contents of the Summary screen, click **Install**.

    Starting with Oracle Database 11*g* Release 2 (11.2), you can save all the installation steps into a response file by clicking **Save Response File**. This file can be used for a silent installation.

11. The Setup screen displays the progress of the Oracle Grid Infrastructure installation.

12. The Finish screen displays the installation status. Click **Close** to end the installation, then **Yes** to confirm you want to exit Oracle Universal Installer.

    If you encounter any problems, refer to the configuration log for information. The path to the configuration log is displayed on the Configuration Assistants window.

13. Oracle ASMCA is installed as part of the Oracle Grid Infrastructure for a Standalone Server installation. To create additional disk groups, run the Oracle ASMCA utility. For example, you can create another disk group named RECOVERY to store the fast recovery area.

    > **Note:** To check if the Oracle High Availability Service is installed properly, run crsctl check has command from *Grid_home*\bin directory. has is a service that is installed with Oracle Restart, which is responsible for starting software services like Oracle Automatic Storage Management.

14. Install Oracle Database. Refer to "Installing the Oracle Database Software" on page 4-11 for information about installing Oracle Database.

    > **Note:**
    >
    > - If a new database is installed after a grid infrastructure installation, then the listener runs from the Oracle Grid Infrastructure home. Because Oracle Automatic Storage Management is installed as part of the Oracle Grid Infrastructure, the default listener is created and runs from the Oracle Grid Infrastructure home. If you perform a database installation, then the database uses the same listener created during the Oracle Grid Infrastructure installation.
    >
    > - If you are using Oracle Restart, then the default listener and any additional listeners must run from the Oracle Grid Infrastructure home.

3.8.2 Installing Oracle Grid Infrastructure for an Existing Database

Follow the high-level instructions in this section to install Oracle Grid Infrastructure and configure it for an existing Oracle database. Oracle Restart can only manage existing 11.2 resources and hence you can install Oracle Grid Infrastructure only for an existing 11.2 database. However, Oracle database releases before 11.2 can coexist on the same server without being managed by Oracle Restart.

To install Oracle Restart for an Existing database:

- On the same host computer as the database, use Oracle Universal Installer to install the Oracle Grid Infrastructure, and select **Install and Configure Oracle Grid Infrastructure for a Standalone Server** as the installation option.

  The Oracle Grid Infrastructure components are installed in a separate Oracle home.

  Refer to "Installing Oracle Grid Infrastructure with a New Database Installation" section on page 15 for detailed instructions.

- Go to the Grid home's `bin` directory.

  Use the `srvctl add database` command with the `-c SINGLE` flag to add the database in an Oracle Restart configuration. Also use the `srvctl add` command to add the listener, the Oracle ASM instance, all Oracle ASM disk groups, and any database services to the Oracle Restart configuration.

  > **See Also:** "srvctl add" in *Oracle Database Administrator's Guide* for more information

3.9 Modifying Oracle Grid Infrastructure Binaries After Installation

After installation, you must first stop the Oracle Restart stack to modify the software installed in your Grid home. For example, to apply a one-off patch or modify any of the DLLs used by Oracle Restart or Oracle ASM, you must follow these steps to stop and restart the Oracle Restart stack.

> **Caution:** To put the changes you make to the Oracle Grid Infrastructure home into effect, you must shut down all executables that run in the Grid home directory and then restart them. In addition, shut down any applications that use Oracle shared libraries or DLL files in the Grid home.

Prepare the Oracle Grid Infrastructure home for modification using the following procedure:

1. Log in using a member of the Administrators group and go to the directory *Grid_home*\bin, where *Grid_home* is the path to the Oracle Grid Infrastructure home.

2. Shut down the Oracle Restart stack using the following command:

    ```
    DRIVE_LETTER:\Grid_home\bin> crsctl stop has -f
    ```

    Alternatively, you can use the `roothas.pl` script to stop Oracle Restart, as shown in the following example:

    ```
    DRIVE_LETTER:\Grid_home\crs\install> perl roothas.pl -unlock
    ```

    The `roothas.pl` script stops Oracle Restart and then verifies that it is stopped.

3. After the Oracle Restart stack is completely shut down, perform the updates to the software installed in the Grid home.

4. Use the following command to restart the Oracle Restart stack:

```
DRIVE_LETTER:\Grid_home\bin> crsctl start has
```

3.10 Manually Configuring Oracle Automatic Storage Management Disk Groups

The Oracle Automatic Storage Management Configuration Assistant utility creates a new Oracle Automatic Storage Management instance if there is no Oracle Automatic Storage Management instance currently configured on this computer. After installing the Oracle Grid Infrastructure for a standalone server, you can also use Oracle Automatic Storage Management Configuration Assistant to create and configure disk groups, Oracle Automatic Storage Management Dynamic Volume Manager and Oracle Automatic Storage Management Cluster File System. If you want to create additional disk groups or manually configure Oracle Automatic Storage Management disks, then you can run the Oracle Automatic Storage Management Configuration Assistant as follows:

```
DRIVE_LETTER:\> cd ORACLE_HOME\bin
DRIVE_LETTER:\> asmca.bat
```

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for further information about Oracle Automatic Storage Management Configuration Assistant

3.11 Testing the Oracle Automatic Storage Management Installation

To test the Oracle Automatic Storage Management installation:

1. Use SQL*Plus to connect to the Oracle Automatic Storage Management instance as the SYS user with SYSASM privilege and start the instance if necessary:

```
DRIVE_LETTER:\>sqlplus /nolog
SQL> CONNECT SYS as SYSASM
Enter password: SYS_password
SQL> STARTUP
```

2. Enter the following command to view the existing disk groups, their redundancy level, and the amount of free disk space in each one:

```
SQL> SELECT NAME,TYPE,TOTAL_MB,FREE_MB FROM V$ASM_DISKGROUP;
```

> **See Also:**
> - *Oracle Database Utilities* for more information about asmcmd
> - *Oracle Automatic Storage Management Administrator's Guide* for a more detailed description of Oracle Automatic Storage Management

4

Installing Oracle Database

You can use 32-bit media for installing Oracle Database on all supported 32-bit operating systems. You can use 64-bit media for installing Oracle Database on all supported 64-bit x64 operating systems. This guide is for both Windows 32-bit and Windows x64. This chapter covers the following topics:

- Preinstallation Considerations for Installing Oracle Database

- Reviewing Component-Specific Installation Guidelines

- Accessing the Installation Software

- Database Security Options

- Installing the Oracle Database Software

- Cloning an Oracle Home

4.1 Preinstallation Considerations for Installing Oracle Database

The Oracle Database software is available on installation media or you can download it from the Oracle Technology Network (OTN) Web site. In most cases, you use the graphical user interface (GUI) provided by Oracle Universal Installer to install the software. However, you can also use Oracle Universal Installer without the GUI by supplying a response file with silent or response file mode.

> **Note:**   Windows Vista, Windows Server 2008, and later versions require Administrator privileges at the command prompt.

> **See Also:**   "Managing User Accounts with User Account Control"

Complete the requirements described in Chapter 2, "Oracle Database Preinstallation Requirements" and "Reviewing Component-Specific Installation Guidelines" on page 4-3 before you begin the installation.

Next, consider the following issues:

- Installation Consideration on Windows Vista, Windows Server 2008, and Later

- Performing Multiple Oracle Database Installations

- Installing on Systems That Already Have Oracle Components

- Installing with Minimum Memory Requirements

4.1.1 Installation Consideration on Windows Vista, Windows Server 2008, and Later

On Windows Vista, Windows Server 2008, and later versions command prompts should be opened with Administrator privileges.

4.1.2 Performing Multiple Oracle Database Installations

If you must perform multiple installations of Oracle Database, then you may want to use either of the following methods to install Oracle Database:

- **Response files**: At each node, you run Oracle Universal Installer from the command line using silent or response file mode and you supply a response file to provide information Oracle Universal Installer needs. The response file is a text file containing the settings you normally enter in the Oracle Universal Installer GUI dialog boxes.

    See Also: Appendix C, "Installing and Configuring Oracle Database Using Response Files"

- **Cloning the Oracle home of an existing Oracle Database installation**: With this method, you install one instance of Oracle Database, and then clone its Oracle home for each additional installation.

    See Also: "Cloning an Oracle Home" on page 4-19

4.1.3 Installing on Systems That Already Have Oracle Components

> **See Also:** "Upgrade Considerations" on page 1-18 before running Oracle Universal Installer

Follow these steps when other components exist on your computer:

1. Log on as a member of the Administrators group for the computer on which you want to install Oracle components.

   If you are installing on a Primary Domain Controller (PDC) or a Backup Domain Controller (BDC), log on as a member of the Domain Administrators group.

2. Delete the ORACLE_HOME environment variable if it exists. See the Microsoft online help for more information about deleting environment variables.

    > **Note:** The ORACLE_HOME environment variable is automatically set in the registry. Manually setting this variable prevents installation.

3. Back up any databases you must upgrade. Review "Upgrade Considerations" on page 1-18 for more information.

    See Also: "Pre-Installation Tasks for Installing Oracle Real Applications Clusters on Windows-Based Systems" in *Oracle Real Application Clusters Installation Guide* before running Oracle Universal Installer

4.1.4 Installing with Minimum Memory Requirements

Installations of Oracle Database on computers with RAM and virtual memory lesser than the minimum required have the following limitations:

- Computers cannot run Oracle Database Upgrade Assistant, Oracle Database Configuration Assistant, or Oracle Net Services Configuration Assistant during an Oracle Universal Installer installation session.

- Depending on how many applications run on the computer, you must further increase the paging file size or reduce the size of the System Global Area (SGA) if you run out of virtual memory. If temporary files and the paging file are both stored on the same physical drive, the space requirements for one may limit the size of another. If your system has limited free space, first install the Oracle Database software. After the installation is finished, create a database with Oracle Database Configuration Assistant.

> **Note:** Do not install the database on computer systems that barely meet the minimum memory and virtual memory requirements of 1 GB.

You can install only the database software by selecting the Install Database Software only option provided on the Select Installation Option screen.

After installation, run the appropriate configuration assistant for your needs:

- To create a new database, run Oracle Database Configuration Assistant. From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, then **Database Configuration Assistant**.

- To upgrade an existing database, run Oracle Database Upgrade Assistant. From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, then **Database Upgrade Assistant**.

4.2 Reviewing Component-Specific Installation Guidelines

Review the following guidelines before starting Oracle Universal Installer:

- Oracle Universal Installer

  Do not use Oracle Universal Installer from an earlier Oracle release to install components from this release.

- Oracle Automatic Storage Management

  In previous releases, Oracle Automatic Storage Management (Oracle ASM) was installed as part of the Oracle Database installation. With Oracle Database 11*g* Release 2 (11.2), Oracle Automatic Storage Management is part of an Oracle Grid Infrastructure installation, either for a cluster, or for a standalone server.

  If you want to upgrade an existing Oracle Automatic Storage Management installation, then you must upgrade Oracle Automatic Storage Management by running an Oracle Grid Infrastructure upgrade. If you do not have Oracle Automatic Storage Management installed and you want to use Oracle Automatic Storage Management as your storage option, then you must complete an Oracle Grid Infrastructure installation before you start your Oracle Database installation.

  > **See Also:** "Oracle Grid Infrastructure for a Standalone Server" for information about Oracle Grid Infrastructure for a standalone server

- Installations on a cluster

If Oracle Clusterware or Oracle RAC is installed on the system, Oracle Universal Installer displays the Specify Hardware Cluster Installation Mode page. You must select **Local Installation**, unless you want to install Oracle RAC.

> **See Also:** *Oracle Real Application Clusters Installation Guide*

4.2.1 Selecting the Database Character Set

Oracle Database uses the database character set for:

- Data stored in SQL character datatypes (CHAR, VARCHAR2, CLOB, and LONG).
- Identifiers such as table names, column names, and PL/SQL variables.
- Stored SQL and PL/SQL source code, including text literals embedded in this code.

Once a database is created, changing its character set is usually very expensive in terms of time and resources. Such operation may require converting all character data by exporting the whole database and importing it back. Therefore, it is important that you carefully select the database character set at installation time.

Oracle recommends Unicode AL32UTF8 as the database character set. Unicode is the universal character set that supports most of the currently spoken languages of the world. It also supports many historical scripts (alphabets). Unicode is the native encoding of many technologies, including Java, XML, XHTML, ECMAScript, LDAP. Unicode is ideally suited for databases supporting the Internet and the global economy.

As AL32UTF8 is a multibyte character set, database operations on character data may be slightly slower when compared to single-byte database character sets, such as WE8MSWIN1252. Storage space requirements for text in most languages that use characters outside of the ASCII repertoire are higher in AL32UTF8 compared to legacy character sets supporting the language. The increase in storage space concerns only character data and only data that is not in English. The universality and flexibility of Unicode usually outweighs these additional costs.

Legacy character sets should be considered when compatibility, storage requirements, or performance of text processing is critical and the database supports only a single group of languages. The database character set to be selected in such case is the character set of most clients connecting to this database.

The default character set suggested or used by Oracle Universal Installer and Database Configuration Assistant in this release is based on the language configuration of the operating system.

For most languages, the default character set is one of the Microsoft Windows character sets, for example WE8MSWIN1252. It is noteworthy that the same default is used by the database installation process on UNIX-based platforms. This results from the assumption that most clients connecting to the database run under the Microsoft Windows operating system. As the database should be able to store all characters coming from the clients and Microsoft Windows character sets have richer character repertoire than the corresponding ISO 8859 character sets, the Microsoft Windows character sets are usually the better choice. For example, the EE8MSWIN1250 character set supports the Euro currency symbol and various smart quote characters, while the corresponding EE8ISO8859P2 character set does not support them. In any case, Oracle converts the data between the database character set and the client character sets, which are declared by the NLS_LANG settings.

The list of database character sets that is presented to you for selection by Oracle Universal Installer contains only the recommended character sets. Even though Oracle Database supports many more character sets, they are either deprecated or they are binary subsets of another recommended character set. For example, WE8DEC is a deprecated character set and US7ASCII and WE8ISO8859P1 are both binary subsets of WE8MSWIN1252.

If, for compatibility reasons, you must create a database in one of the non-recommended character sets, choose the Advanced database configuration option. Database Configuration Assistant in the interactive mode gives you the opportunity to select any of the database character sets supported on Windows.

> **Caution:** AL32UTF8 is the Oracle Database character set that is appropriate for XMLType data. It is equivalent to the IANA registered standard UTF-8 encoding, which supports all valid XML characters.
>
> Do not confuse Oracle Database database character set UTF8 (no hyphen) with database character set AL32UTF8 or with character encoding UTF-8. Database character set UTF8 has been superseded by AL32UTF8. Do not use UTF8 for XML data. UTF8 supports only Unicode version 3.0 and earlier; it does not support all valid XML characters. AL32UTF8 has no such limitation.
>
> Using database character set UTF8 for XML data could cause an irrecoverable error or affect security negatively. If a character that is not supported by the database character set appears in an input-document element name, a replacement character (usually a question mark) is substituted for it. This terminates parsing and raises an exception.

4.2.2 Using an Oracle Automatic Storage Management Disk Group

This section is optional and describes how to identify disk groups and determine the free disk space that they contain. You can store either database or recovery files in an existing Oracle Automatic Storage Management disk group that you created during the Oracle Grid Infrastructure installation.

> **Note:** The Oracle Automatic Storage Management instance that manages the existing disk group runs in a different Oracle home directory.

To determine whether an existing Oracle Automatic Storage Management disk group exists, or to determine whether there is sufficient disk space in a disk group, use the following procedure:

1. In the **Services** Control Panel, ensure that the `OracleASMService+ASM` service has started.

2. Open command prompt and temporarily set the `ORACLE_SID` environment variable to specify the appropriate value for the Oracle Automatic Storage Management instance.

    For example, if the Oracle Automatic Storage Management SID, which is named `+ASM`, is located in the `asm` directory, you would enter the following setting:

    ```
    DRIVE_LETTER:\>set ORACLE_SID=+ASM
    ```

3. Connect to the Oracle Automatic Storage Management instance as the `SYS` user with the `SYSASM` privilege and start the instance if necessary:

```
DRIVE_LETTER:\>sqlplus /nolog
SQL> CONNECT SYS as SYSASM
Enter password: SYS_password
SQL> STARTUP
```

4. Enter the following command to view the existing disk groups, their redundancy level, and the amount of free disk space in each one:

```
SQL> SELECT NAME,TYPE,TOTAL_MB,FREE_MB FROM V$ASM_DISKGROUP;
```

5. From the output, identify a disk group with the appropriate redundancy level and note the free space that it contains.

6. If necessary, install, or identify the additional disk devices required to meet the storage requirements listed in the previous section.

> **Note:** If you are adding devices to an existing disk group, then Oracle recommends that you use devices that have the same size and performance characteristics as the existing devices in that disk group.

> **See Also:** "Upgrading Existing Oracle Automatic Storage Management Instances"

4.3 Accessing the Installation Software

The Oracle Database software is available on installation media or you can download it from the Oracle Technology Network Web site, or Oracle Software Cloud Web site. To install the software from the hard disk, you must either download it and unpack it, or copy it from the installation media, if you have it.

You can access and install Oracle Database by using one of the following methods:

- Installing from a Remote DVD Drive

- Installing on Remote Computers Through Remote Access Software

- Downloading Oracle Software

- Copying the Oracle Database Software to a Hard Disk

4.3.1 Installing from a Remote DVD Drive

If the computer where you want to install Oracle Database does not have a DVD drive, you can perform the installation from a remote DVD drive. You must complete the following steps:

- Step 1: On the Remote Computer, Share the DVD Drive

- Step 2: On the Local Computer, Map the DVD Drive

4.3.1.1 Step 1: On the Remote Computer, Share the DVD Drive

The remote DVD drive must allow shared access. To set this up, perform these steps on the remote computer that has the DVD drive:

1. Log in to the remote computer as an Administrator user.

   2. Start Windows Explorer.

   3. Right-click the DVD drive letter and select **Sharing** (or **Sharing and Security**).

   4. Click the **Sharing** tab and do the following:

   a. Select **Share this folder**.

   b. In **Share name**, give it a share name such as `dvd`. You use this name when you map the DVD drive on the local computer in step d of the next section.

   c. Click **Permissions**. You need at least read permission for the user who accesses the drive to install Oracle Database.

   d. Click **OK** when you are finished.

   5. Insert the Oracle Database installation media into the DVD drive.

4.3.1.2 Step 2: On the Local Computer, Map the DVD Drive

Perform these steps on the local computer to map a remote DVD drive and to run Oracle Universal Installer from the mapped drive:

   1. Map the remote DVD drive.

   a. Start Windows Explorer on the local computer.

   b. From the **Tools** menu, select **Map Network Drive** to display the Map Network Drive dialog box.

   c. Select a drive letter to use for the remote DVD drive.

   d. In **Folder**, enter the location of the remote DVD drive using the following format:

   `\\`*`remote_hostname`*`\`*`share_name`*

   where:

   – *`remote_hostname`* is the name of the remote computer with the DVD drive.

   – *`share_name`* is the share name that you entered in step 4 of the previous procedure. For example:

   `\\computer2\dvd`

   e. If you must connect to the remote computer as a different user, click **different user name**, and enter the user name.

   f. Click **Finish**.

   2. Run Oracle Universal Installer from the mapped DVD drive.

   3. Go to the "Installing the Oracle Database Software" section on page 4-11.

4.3.2 Installing on Remote Computers Through Remote Access Software

If you want to install and run Oracle Database on a remote computer (that is, the remote computer has the hard drive and runs Oracle Database components), but you do not have physical access to the computer, you still can perform the installation on the remote computer if it is running remote access software such as VNC or Symantec pcAnywhere. You also need the remote access software running on your local computer.

You can install Oracle Database on the remote computer in one of two ways:

- If you have copied the contents of the Oracle Database DVD to a hard drive, you can install the software from the hard drive.

- You can insert the DVD into a drive on your local computer, and install the software from the DVD.

4.3.2.1 Installing on Remote Computers from a Hard Drive

If you have copied the contents of the Oracle Database DVD to a hard drive, you can install the software from the hard drive.

To install the software on a remote computer from a hard drive:

1. Ensure that the remote access software is installed and running on the remote and local computers.

2. Share the hard drive that contains the Oracle Database DVD.

3. On the remote computer, map a drive letter to the shared hard drive. You use the remote access software to do this on the remote computer.

4. Through the remote access software, run Oracle Universal Installer on the remote computer. You access Oracle Universal Installer from the shared hard drive.

5. Go to the "Installing the Oracle Database Software" section on page 4-11.

4.3.2.2 Installing on Remote Computers from a Remote DVD Drive

You can insert the DVD into a drive on your local computer, and install from the DVD.

To install the software on a remote computer from a remote DVD drive:

1. Ensure that the remote access software is installed and running on the remote and local computers.

2. On the local computer, share the DVD drive.

   On the remote computer, map a drive letter to the shared DVD drive. You use the remote access software to do this on the remote computer.

   These steps are described in the "Installing from a Remote DVD Drive" section on page 4-6.

3. Through the remote access software, run Oracle Universal Installer on the remote computer. You access Oracle Universal Installer from the shared DVD drive.

4. Go to the "Installing the Oracle Database Software" section on page 4-11.

4.3.3 Downloading Oracle Software

You can download the trial version of the installation files from the Oracle Technology Network (OTN) or Oracle Software Delivery Cloud Web site and extract them on your hard disk. Ensure that you completely review and understand the terms of the license. Most downloads include the Development License. This section contains the following topics:

- Downloading the Installation Archive Files from Oracle Technology Network

- Downloading the Software from Oracle Software Delivery Cloud

- Extracting the Installation Files

4.3.3.1 Downloading the Installation Archive Files from Oracle Technology Network

To download the installation archive files from Oracle Technology Network:

1. Use any browser to access the software download page from Oracle Technology Network:

   http://www.oracle.com/technetwork/indexes/downloads/index.html

2. Navigate to the download page for the product to install.

3. On the download page, identify the required disk space by adding the file sizes for each required file.

   The file sizes are listed next to the file names.

4. Select a file system with enough free space to store and expand the archive files.

   In most cases, the available disk space must be at least twice the size of all of the archive files.

5. On the file system that you selected in step 4, create a parent directory for each product, for example OraDB11g, to hold the installation directories.

6. Download all of the installation archive files to the directory that you created in step 5.

7. Verify that the files you downloaded are the same size as the corresponding files on Oracle Technology Network. Also, verify the checksums are the same as noted on Oracle Technology Network.

8. Extract the files in each directory that you just created.

9. After you have extracted the required installation files, see Section 4.5, "Installing the Oracle Database Software."

4.3.3.2 Downloading the Software from Oracle Software Delivery Cloud

You can download the software from Oracle Software Delivery Cloud as Media Packs. A Media Pack is an electronic version of the software that is also available to Oracle customers on CD-ROM or DVD. To download the Media Pack:

1. Use any browser to access the Oracle Software Delivery Cloud Web site:

   http://edelivery.oracle.com/

2. Complete the Export Validation process by entering information (name, company, e-mail address, and country) in the online form.

3. In the Media Pack Search page, specify the Product Pack and Platform to identify the Media Pack you want to download. If you do not know the name of the Product Pack, you can search for it using the License List.

4. Optionally, select the relevant product to download from the **Results** list.

5. In the search results page, click **Readme** to download and review the Readme file for download instructions and product information.

6. After you review the Readme, choose the appropriate Media Pack from the search results to download the individual zip files. Follow the Download Notes instructions in this page. Once you download and extract the contents of the required zip files, proceed with the installation of the software.

   > **Note:** Print the page with the list of downloadable files. It contains a list of part numbers and their corresponding descriptions to refer during the installation process.

7. After you download the files, click **View Digest** to verify that the MD5 or SHA-1 checksum matches with what is listed in the media download page.

> **See Also:**
> - My Oracle Support note 549617.1 for information on how to verify the integrity of a software download at
>
>   https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=549617.1
> - *Frequently Asked Questions* section on the Oracle Software Delivery Cloud Web site for more information about Media Packs

4.3.3.3 Extracting the Installation Files

To extract the installation archive files, perform the following steps:

1. If necessary, change to the directory that contains the downloaded installation archive files.

2. The Oracle Database software is available as two zip files. Ensure that you extract both the zip files to the same directory.

When you have extracted all of the required installation files, see "Installing the Oracle Database Software".

4.3.4 Copying the Oracle Database Software to a Hard Disk

To copy the contents of the installation media to a hard disk:

1. Create a directory on your hard drive. For example:

```
C:\> mkdir \install
C:\> mkdir \install\database
```

2. Copy the contents of the installation media to the directory that you just created.

3. After you have copied all of the required installation files, see the "Installing the Oracle Database Software" section on page 4-11.

4.4 Database Security Options

During installation, you are prompted to select a database security configuration. The Secure Configuration option configures the database with database auditing options, and password policy and expiration settings.

For new database installations, the default configuration for Oracle Database 11*g* Release 2 (11.2) includes the Secure Configuration option. If you want to disable these enhanced security controls, then you can uncheck the Assert all new security settings check box in the Specify Configuration Option screen that appears during installation. Oracle Database is then installed with default options for Oracle Database 10*g* Release 2. After installation, you can change security settings by starting DBCA and modifying security settings. You can enable or disable auditing or password security settings, or revert to a previous security setting.

For database upgrades, the upgraded database retains your existing database security configuration, to ensure compatibility with existing applications. After installation, you can use DBCA to enable or disable the Secure Configuration option for testing.

> **Note:**
>
> - Oracle strongly recommends configuring your database with the Secure Configuration option either during installation, or after installation using DBCA.
>
> - If Oracle Database Vault is installed with the database, then do not check for secure configuration as the database is secured.

4.5 Installing the Oracle Database Software

In most cases, you use the graphical user interface (GUI) provided by Oracle Universal Installer to install Oracle Database. The instructions in this section explain how to run the Oracle Universal Installer GUI to perform most database installations.

> **See Also:**
>
> - If you plan to use Oracle Restart or Oracle Automatic Storage Management, then you must install Oracle Grid Infrastructure before you install and create the database. Otherwise, you must manually register the database with Oracle Restart. For information about installing Oracle Grid Infrastructure, see "Installing and Configuring the Oracle Grid Infrastructure for a Standalone Server"
>
> - You may have to shut down existing Oracle processes before you start the database installation. See "Stopping Existing Oracle Services"
>
> - Appendix C, "Installing and Configuring Oracle Database Using Response Files" to install Oracle Database using the silent or response file installation method, without the GUI. It also explains how to clone an existing Oracle home. These methods are useful to perform multiple installations of Oracle Database.

To install the Oracle Database software:

1. Log on as a member of the Administrators group for the computer on which you want to install Oracle components.

   If you are installing on a Primary Domain Controller (PDC) or a Backup Domain Controller (BDC), log on as a member of the Domain Administrators group.

2. If you are installing Oracle Database on a computer with multple Network Interface Cards or multiple aliases, use **System** in the Control Panel to create the `ORACLE_HOSTNAME` system environment variable. Set this variable to point to the host name of the computer on which you are installing Oracle Database.

   > **See Also:**
   >
   > - "Setting the ORACLE_HOSTNAME Environment Variable" on page 2-11
   >
   > - "Installing Oracle Database on Computers with Multiple IP Addresses" on page 2-10
   >
   > - "Installing Oracle Database on Computers with Multiple Aliases" on page 2-11

3. Insert Oracle Database installation media and navigate to the `database` directory. Alternatively, navigate to the directory where you downloaded or copied the installation files.

   Use the same installation media to install Oracle Database on all supported Windows operating systems.

4. Double-click `setup.exe` to start Oracle Universal Installer.

   Downloading Updates Before Installation

   Starting with Oracle Database 11*g* Release 2 (11.2.0.2), if you plan to run the installation in a secured data center, then you can download updates before starting the installation by starting Oracle Universal Installer on a system that has Internet access in update download mode. To start Oracle Universal Installer to download updates before installation, enter the following command:

   ```
   setup.exe -downloadUpdates
   ```

   Provide the My Oracle Support user name and password, and provide proxy settings if needed on the Provide My Oracle Support credentials screen. Then, enter the **Download location** and click **Download** on the Download software updates screen. If updates are available, then they are downloaded in the location provided. The Finish Updates screen shows the successful download of the updates. Click **Close**.

   After you download updates, transfer the update file to a directory on the server where you plan to run the installation.

   > **See Also:**
   >
   > - *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about response file formats
   >
   > - "Software Updates Option" on page 1-10

5. Follow these guidelines to complete the installation:

   - Do not install Oracle Database 11*g* Release 2 (11.2) software into an existing Oracle home.

   - Follow the instructions displayed in the Oracle Universal Installer screens. If you need additional information, click **Help**.

     > **See Also:** "Unlocking and Resetting User Passwords" on page 6-9 for password guidelines

   - Do not modify the Java Runtime Environment (JRE) except by using a patch provided by Oracle Support Services. Oracle Universal Installer automatically installs the Oracle-supplied version of the JRE. This version is required to run Oracle Universal Installer and several Oracle assistants.

   - If you encounter errors while installing the software, see Appendix F for information about troubleshooting.

   - If you chose an installation type that runs Oracle Database Configuration Assistant in interactive mode, then you must provide detailed information about configuring your database and network.

     If you need help when using the Oracle Database Configuration Assistant in interactive mode, click **Help** on any screen.

> **Note:** If you chose a default installation, Oracle Database
> Configuration Assistant does not run interactively.

6. When the Configuration Assistant tasks are complete, click **Finish**, click **Exit**, then click **Yes** to exit from Oracle Universal Installer.

7. Optionally, delete the `OraInstalldate_time` directory to remove the temporary files that were created during the installation process. The `OraInstalldate_time` directory holds about 45 MB of files. This directory is created in the location set by the `TEMP` environment variable setting.

   Restarting your computer also removes the `OraInstalldate_time` directory.

8. See Chapter 5, "Oracle Database Postinstallation Tasks" for information about tasks that you must complete after you have installed Oracle Database.

The following table lists the various screens displayed during an Enterprise Edition installation for Oracle Database 11*g* Release 2 (11.2):

Table 4–1   Oracle Universal Installer Windows

Screen	Action
Configure Security Updates	Enter your e-mail address, preferably your My Oracle Support (formerly Oracle*MetaLink*) e-mail address or user name in the **Email** field.
	You can select the **I wish to receive security updates via My Oracle Support** check box to receive security updates.
	Enter your My Oracle Support (formerly Oracle*MetaLink*) password in the **My Oracle Support Password** field.
	Click **Next**.
Download Software Updates	Starting with Oracle Database 11*g* Release 2 (11.2.0.2), you can use the Software Updates feature to dynamically download and apply latest updates. Select one of the following options, and click **Next**:
	■ Use My Oracle Support credentials for download: Select this option to download and apply the latest software updates.
	Click **Proxy Settings** to configure a proxy for Oracle Universal Installer to use to connect to the Internet. Provide the proxy server information for your site, along with a user account that has access to the local area network through which the server is connecting. Starting with Oracle Database 11*g* Release 2 (11.2.0.3), you can enter the Proxy Realm information. The proxy realm information is case-sensitive. If you do not have a proxy realm, then you do not need to provide an entry for the Proxy Username, Proxy Password, and Proxy Realm fields.
	Click **Test Connection** to ensure that your proxy settings are correctly entered, and the installer can download the updates.
	■ Use pre-downloaded software updates: Select this option if you have already downloaded software updates using the Oracle Universal installer command `setup.exe -downloadUpdates`.
	■ Skip software updates: Select this option if you do not want to apply any updates.
	See Also: "Software Updates Option" on page 1-10
Apply Software Updates	This screen is displayed if you select to download the software updates, or provide the pre-downloaded software updates location.
	■ If you selected Use My Oracle Support credentials for download in the previous screen, select **Download and apply all updates**, and then click **Next** to apply the updates.
	By default, the download location for software updates is placed in the home directory of the Oracle installation owner you are using to run this installation. If you choose to download the software updates in another location, then click **Browse** and select a different location on your server.
	■ If you selected Use pre-downloaded software updates in the previous screen, select **Apply all updates**, and then click **Next** to apply the updates downloaded before starting the installation.
Select Installation Option	Select one of the following installation options, click **Next**.
	■ Create and configure a database: This option creates a new database along with sample schemas.
	■ Install database software only: This option installs only the database binaries. To configure database, you must run Oracle Database Configuration Assistant after the software installation.
	■ Upgrade an existing database: This option installs the software binaries in a new Oracle home. At the end of the installation, you can upgrade the existing database.

Table 4–1   (Cont.) Oracle Universal Installer Windows

Screen	Action
System Class	Select the type of system for installing the database, click **Next**.
	■ Desktop Class: Choose this option if you are installing on a laptop or desktop class system. This option includes a starter database and allows minimal configuration. This option is designed for those who want to get up and running with the database quickly.
	■ Server Class: Choose this option if you are installing on a server class system, such as what you would use when deploying Oracle in a production data center. This option allows for more advanced configuration options. Advanced configuration options available using this option include Oracle RAC, Oracle Automatic Storage Management, backup and recovery configuration, integration with Enterprise Manager Grid Control, and more fine-grained memory tuning, among many others.
Grid Installation Options	Select the type of database installation you want to perform, click **Next**.
	■ Single instance database installation: This option installs the database and the listener.
	■ Oracle Real Application Clusters database installation: This option installs Oracle Real Application Clusters.
	■ Oracle RAC One Node database installation: This option installs Oracle RAC One Noda database.
	Note: Oracle RAC One Node is only supported with Oracle Clusterware.
Select Install Type	Select one of the following, then click **Next**:
	■ Typical Install: This installation method is selected by default. It lets you quickly install Oracle Database using minimal input. It installs the software and optionally creates a general-purpose database using the information that you specify on this screen.
	■ Advanced Install: This installation method enables to perform more complex installations, such as creating individual passwords for different accounts, creating specific types of starter databases (for example, for transaction processing or data warehouse systems), using different language groups, specifying e-mail notifications, and so on.
Select Product Languages	This option enables you to select the language in which you want to run the product.
	Select the product Language from the Available Languages list, transfer it to the Selected Languages list. Click **Next**.
Select Database Edition	Select Enterprise Edition, Standard Edition, Standard Edition One, or Personal Edition. Click **Next**
	If you click **Select Options**, then based on your selection you can enable or disable components from the components list. The components available are:
	■ Oracle Partitioning
	■ Oracle OLAP
	■ Oracle Label Security
	■ Oracle Data Mining RDBMS Files
	■ Oracle Database Vault option
	■ Oracle Real Application Testing
	■ Oracle Database Extensions for .NET
	Click **OK** to continue.
	Click **Next**.
	Note: The **Select Options** button is enabled only if you select the Enterprise Edition installation type.

Table 4–1   (Cont.) Oracle Universal Installer Windows

Screen	Action
Specify Installation Location	The Oracle base path appears by default. You can change the path based on your requirement. Specify **Oracle Base**, **Software Location**, and click **Next**.
	The Oracle base directory is a top-level directory for Oracle software installations owned by an Oracle installation owner account. The default Oracle base path is *DRIVE_LETTER:\app\user*, where user is the user account running the installation. You can change the path based on your requirements.
	In the **Software Location** field, accept the default value or enter the Oracle home directory path in which you want to install Oracle components. The directory path should not contain spaces.
	Click **Next**.
	Note: This screen is available only with Advanced Installation.
	See Also: "Optimal Flexible Architecture Directory Naming Conventions" for information about directory naming conventions
Select Configuration Type	Select one of the following, click **Next**:
	▪ General Purpose / Transaction Processing: This is a starter database designed for general usage or transaction-heavy applications.
	▪ Data Warehousing: A starter database optimized to run Data Warehousing applications.
	See the online Help provided by either Oracle Universal Installer or Oracle Database Configuration Assistant for a description of these preconfigured database types.
Specify Database Identifiers	Specify the following information, then click **Next**:
	Database Naming
	Specify the Global Database Name using the following syntax:
	database_unique_name.db_domain
	where:
	▪ *database_unique_name* is the name of the database. It can contain a maximum of 30 characters as long as the first eight characters are unique and begin with an alphabetic character. The characters can include alphanumeric, underscore (_), dollar ($) , and pound (#), no other special characters are permitted in a database name.
	▪ *db_domain* is the computer environment used for the database. It should contain no more than 128 characters (alphanumeric, underscore (_), and pound (#)), inclusive of all periods.
	Note: Ensure that the combination of database name (first eight unique characters of database unique name), delimiter, and the database domain name does not exceed 128 characters.
	For example:
	`sales.us.example.com`
	where:
	▪ *database_unique_name* is *sales*
	▪ *db_domain* is *us.example.com*
	When you enter the Global Database Name, Oracle Universal Installer automatically populates the SID prefix with the database name. You can change this name in Advanced installation.
	Oracle Universal Installer limits the SID to 12 alphanumeric characters and the SID cannot contain underscore (_), dollar ($), and pound (#).

Table 4–1   (Cont.) Oracle Universal Installer Windows

Screen	Action
Specify Configuration Options	Specify the following configuration details, then click **Next.**
	Memory:
	Enable Automatic MemoryManagement option is selected by default. This option allows the database to automatically distribute memory between SGA and PGA. If you deselect this option, then the SGA and PGA must be sized manually.
	Character Sets:
	This option enables you to store the character data in the database in one of the following methods:
	▪ Use the default: This option uses the operating system language settings.
	▪ Use Unicode: This option enables you to store multiple language groups.
	▪ Choose from the following list of character sets: This option enables the **Select Database Character Set** drop down list.
	See Also:
	▪ "Selecting the Database Character Set"
	▪ *Oracle Database Globalization Support Guide* for information about choosing a character set.
	Security:
	The Assert all new security settings option is selected by default. The setting includes enabling auditing and using new password profile.
	Note: Oracle recommends that you use the default settings.
	Sample Schemas:
	The Create database with sample schemas option is not selected by default. However, you can select the option, to create the starter database with sample schema.
Specify Management Options	Select one of the following, then click **Next**:
	▪ Use an existing Oracle Enterprise Manager Grid Control for database management: This option is useful if you have Oracle Enterprise Manager installed.
	▪ Use Oracle Enterprise Manager Database Control for database management: This option enables you to manage Oracle Database locally. Optionally, select Enable Email Notifications and then enter the outgoing SMTP server and e-mail address.
	See Also: "Email Notification Options"
	Note: The option to enable e-mail notifications is not available starting with Oracle Database 11*g* Release 2 (11.2.0.2).
Specify Database Storage Options	Select one of the following, then click **Next**.
	▪ File System: Specify the database file location.
	▪ Oracle Automatic Storage Management: Specify a password for the ASMSNMP user.
	Note: Installing Oracle data files on an Oracle ACFS file system is not supported. Oracle recommends that these data files are installed in Oracle ASM disk groups.
	See Also: "Using an Oracle Automatic Storage Management Disk Group" on page 4-5

Table 4–1   (Cont.) Oracle Universal Installer Windows

Screen	Action
Specify Recovery Options	Select one of the following, then click **Next**. ■ Do not enable automated backups. ■ Enable automated backups: If you select this option, then the backup job uses a specified recovery area storage. Select **File System** to use a file system directory for the fast recovery area, and then specify the fast recovery area path in the **Recovery Area location** field. Select **Oracle Automatic Storage Management** to use an Oracle Automatic Storage Management disk group for the fast recovery area. Specify your operating system user credentials to perform the backup job. **See Also:** "Preparing Disks for an Oracle Automatic Storage Management Installation" on page 3-5
Select ASM Disk Group	This screen is displayed only if you select Oracle Automatic Storage Management as your storage option. Disk groups are created during the Oracle Grid Infrastructure installation. Disk groups are configured with the SYSASM privilege using asmcmd or SQL create diskgroup commands. An ASM disk group consists of multiple disk partitions. The table in this screen displays existing disk groups created during the Oracle Grid Infrastructure installation. Select a disk group to use for database file storage.
Specify Schema Passwords	Enter and confirm passwords for the privileged database accounts: SYS, SYSTEM, SYSMAN, and DBSNMP. Click **Next**. **Note:** Optionally, you can use the same password for all accounts. However, Oracle recommends that you specify a different password for each account. You must remember the passwords that you specify. **See Also:** "Unlocking and Resetting User Passwords" on page 6-9 for information about password guidelines
Perform Prerequisite Checks	This option checks if the minimum system requirements to perform the database installation are met. Click **Fix & Check Again**, if you want the installer to fix the problem and check the system requirements once more. If you click **Check Again**, then you can run the prerequisite check again to see if the minimum requirements are met to carry on with the database installation. To get a list of failed requirements, select **Show Failed** from the list. To get a list of all the prerequirement checks run by the OUI, select **Show All**. To get a list of the prerequirement checks that are successful, select **Show Succeeded**. **Note:** Oracle recommends that you use caution in checking the **Ignore All** option. If you check this option, then Oracle Universal Installer may not confirm that your system can install Oracle Database successfully. **See Also:** "Oracle Database Preinstallation Requirements" for information about the system requirements

Table 4–1 (Cont.) Oracle Universal Installer Windows

Screen	Action
Summary	Review the information displayed on this screen, and click **Install**.
	Note: Starting with Oracle Database 11*g* Release 2 (11.2), you can save all the installation steps into a response file by clicking **Save Response File.** Later, this file can be used for a silent installation.
Install Product	This screen displays the progress of a database installation. It also shows the status information while the product is being installed. Click **Next**.
	This screen then displays the status information for the configuration assistants that configure the software and create a database. When the message is displayed after Database Configuration Assistant process, click **OK** to continue.
Finish	This screen is shown automatically when all the configuration tools are successful.
	Review the Enterprise Manager Database Control URL information displayed in this screen and click **Close**.

4.6 Cloning an Oracle Home

You can copy an existing Oracle home and then configure it for a new environment. This process is called cloning. If you are performing multiple Oracle Database installations, you may want to use this method to create each new Oracle home, because copying files from an existing Oracle Database installation takes less time than creating a new version of them. This method is also useful if the Oracle home that you are cloning has patches applied to it. When you clone an Oracle home, the new Oracle home has the patch updates.

When you clone Oracle homes using release 11.2 Database Control, you must update the exclude file list. This file list specifies files that need not be included when the source Oracle home is archived because these files are not required for the cloning operation. Do not include the following files in the archive:

- sqlnet.ora
- tnsnames.ora
- listener.ora

> **Note:** In addition to cloning an Oracle home, you can clone individual Oracle databases, by using Enterprise Manager Database Control. *Oracle Database Administrator's Guide* covers cloning Oracle databases in detail, and cloning Oracle homes.

This section contains the following topics:

- Cloning an Oracle Home
- Configuring Oracle Configuration Manager in a Cloned Oracle Home

4.6.1 Cloning an Oracle Home

Perform the following steps to clone an Oracle home:

1. Ensure that the Oracle Database installation whose home you want to clone has been successful.

You can check the success of the installation by reviewing the installAction*date_time*.log file for the installation session, which is normally located in the C:\Program Files\Oracle\Inventory\logs directory.

If you have installed patches, you can check their status by running the following commands at a command prompt:

```
C:\ORACLE_HOME\OPatch> set ORACLE_HOME=ORACLE_HOME_using_patch
C:\ORACLE_HOME\OPatch> opatch lsinventory
```

2. Stop the Oracle-related services on this computer.

   You can stop Oracle services by using one of the following methods:

   - **Oracle Administration Assistant for Windows**: From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, then **Administrative Assistant for Windows**, then **Oracle Managed Objects**, then **Computers**, and then ***machine-name***. Select Databases, then right-click ***global database name***, select **Stop Service**.

   > **Note:** Choose Startup/Shutdown Options to control whether a database instance should be stopped along with the service.

   - **Microsoft Windows Services utility**: From the **Start** menu, select **Control Panel**, then **Administrative Tools**, then **Services**. Right-click any service that begins with **Oracle**, and then from the menu, select **Stop**.

3. Create a ZIP file with the Oracle home (but not Oracle base) directory, selecting the **Save full path info** option.

   For example, if the source Oracle installation is in C:\app*username*\product\11.2.0\dbhome_1, you zip the dbhome_1 directory, leaving out the admin, flash_recovery_area, and oradata directories that are under 11.2.0. These directories are created in the target installation later on when you create a new database there.

4. Copy the ZIP file to the root directory of the target computer.

5. Extract the ZIP file contents, selecting the **Use folder names** option.

6. Repeat steps 4 and 5 for each computer where you want to clone the Oracle home, unless the Oracle home is on a shared storage device.

7. In the source Oracle home, restart the services that you stopped in step 2.

8. On the target computer, cd to the unzipped Oracle home directory, and perform the following steps:

   a. Remove the *.ora files that are present in unzipped *ORACLE_HOME*\network\admin directory, such as listener.ora, sqlnet.ora, and tnsnames.ora.

   b. From the clone\bin directory, run clone.pl for the unzipped Oracle home. Use the following syntax:

   ```
   C:\ORACLE_HOME\clone\bin>%ORACLE_HOME%\perl\bin\per.exe clone.pl
   ORACLE_HOME="target location" ORACLE_BASE="target Base location"

   -defaultHomeName
   ```

   For example:

```
C:\ORACLE_HOME\clone\bin> clone.pl

ORACLE_HOME="C:\app\username\product\11.2.0\dbhome_1" -defaultHomeName
ORACLE_BASE="C:\app\username"
```

Oracle Universal Installer starts, and then records the cloning actions in the cloneActions*timestamp*.log file. This log file is normally located in C:\Program Files\Oracle\Inventory\logs.

9. To configure connection information for the new database, run Net Configuration Assistant.

   To start Net Configuration Assistant, select **Start**, then **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, and then **Net Configuration Assistant**.

10. To create a new database for the newly cloned Oracle home, run Oracle Database Configuration Assistant.

    To start Oracle Database Configuration Assistant, select **Start**, then **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, and then **Database Configuration Assistant**.

    > **See Also:**
    >
    > - *Oracle Database Administrator's Guide* for information about cloning Oracle homes and Oracle databases
    > - *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for additional information about cloning an Oracle home

4.6.2 Configuring Oracle Configuration Manager in a Cloned Oracle Home

Perform the following steps to configure Oracle Configuration Manager for a cloned Oracle home:

1. Run the following command from *ORACLE_HOME*\ccr\state:

   ```
   del *.ll*
   ```

2. Run the following command from *ORACLE_HOME*:

   ```
   copy ccr\inventory\core.jar ccr\inventory\pending
   ```

3. Run these commands from *ORACLE_HOME*\ccr\bin:

   ```
   emSnapshotEnv
   deployPackages
   ```

4. If new credentials are needed, run this command from *ORACLE_HOME*\ccr\bin.

   ```
   configCCR
   ```

If Oracle Configuration Manager was manually configured using setupCCR, then perform the following in the cloned Oracle home:

1. Delete all the subdirectories of the *ORACLE_HOME*\ccr\hosts directory to remove the previously configured hosts.

2. Run the following command from *ORACLE_HOME*\ccr\bin:

   ```
   configCCR -a
   ```

If you have installed Oracle Configuration Manager in the original Oracle home but have not configured it, then run the following command in the cloned Oracle home to configure it:

```
setupCCR
```

5

Oracle Database Postinstallation Tasks

This chapter describes the following postinstallation configuration tasks:

- Installing the Latest Patch Set Release
- Validating Invalid PL/SQL Modules
- Configuring the Secure Sockets Layer
- Postinstallation Tasks for Oracle SQL Developer
- Configuring Oracle Components
- Creating a Fast Recovery Area Disk Group
- Enabling and Disabling Database Options

5.1 Installing the Latest Patch Set Release

Oracle recommends installing the latest patch set release after successful installation of Oracle Database.

You must register online before using My Oracle Support (formerly Oracle*MetaLink*). After logging in to My Oracle Support (formerly Oracle*MetaLink*), select the **Patches and Updates** tab from the top of the screen.

To find and download patches:

1. Use a web browser to view the My Oracle Support website:

   https://support.oracle.com/

2. Log in to My Oracle Support.

   > **Note:** If you are not a My Oracle Support (formerly Oracle*MetaLink*) registered user, then click **Register here** for New user and follow the registration instructions.

3. On the main My Oracle Support page, click **Patches and Update**s tab.

4. In the Patch Search group, select **Product or Family (Advanced)**.

5. In the Product field, select **Oracle Database**.

6. In the Release field, select the release number. For example, Oracle 11.2.0.3.2

7. Click **Search**.

8. Any available patch updates are displayed in the Patch Search page.

9. Select the patch number and click **ReadMe**. The README page is displayed and contains information about the patch set and how to apply the patches to your installation.

10. Return to the Patch Search page, click **Download**, and save the file on your system.

11. Use the unzip utility provided with Oracle Database 11*g* to uncompress the Oracle patch updates that you downloaded from My Oracle Support. The unzip utility is located in the `ORACLE_BASE\ORACLE_HOME\bin` directory.

5.2 Validating Invalid PL/SQL Modules

Run the `utlrp.sql` script after creating or upgrading a database. This script recompiles all PL/SQL modules that may be in an INVALID state, including packages, procedures, types, and so on. This step is optional, but recommended so that the performance cost of recompilation is incurred during the installation rather than in the future.

> **Note:** There should be no other data definition language (DDL) statements running on the database while the script is running, and packages `STANDARD` and `DBMS_STANDARD` must be valid.

---

1. Start SQL*Plus:

   ```
   DRIVE_LETTER:\> sqlplus /nolog
   ```

2. Connect to the database with the `SYS` account:

   ```
   SQL> CONNECT SYS AS SYSDBA
   Enter password: SYS_password
   ```

3. Start the database (if necessary):

   ```
   SQL> STARTUP
   ```

4. Run the `utlrp.sql` script, which by default is located in `ORACLE_HOME\rdbms\admin\utlrp.sql`. For example:

   ```
   SQL> @?\rdbms\admin\utlrp.sql
   ```

5.3 Configuring the Secure Sockets Layer

Oracle highly recommends you configure and use a Secure Sockets Layer (SSL) to ensure that passwords and other sensitive data are not transmitted in clear text in HTTP requests.

> **See Also:**
>
> - "Using SSL" and "Enabling SSL" in *Oracle Database Security Guide* for more information about configuring and using SSL
>
> - "SSL Usage Issues" in *Oracle Database Security Guide* for more information about SSL usage issues

5.4 Postinstallation Tasks for Oracle SQL Developer

See the following sections in *Oracle SQL Developer Installation Guide* for recommended postinstallation tasks for SQL Developer:

- Migrating User Settings from a Previous Release

- Migrating Information from Previous Releases

- Location of User-Related Information

5.5 Configuring Oracle Components

Many Oracle products and options must be configured before you use them for the first time. Before using individual Oracle products or options, refer to the appropriate manual in the product documentation library.

This section contains these topics:

- Direct NFS Client

- Configuring Oracle Messaging Gateway

- Configuring Oracle Administration Assistant for Windows

- Configuring Oracle Counters for Windows Performance Monitor

- Configuring Oracle Label Security

- Configuring Oracle Database Vault

- Configuring Oracle Net Services

- Installing Oracle Text Supplied Knowledge Bases

- Installing the Oracle Text Filtering Component

- Configuring or Reinstalling Oracle XML DB

- Configuring PL/SQL External Procedures

- Configuring Shared Server Support

- Setting Credentials for the Job System to Work with Oracle Enterprise Manager

- Configuring Oracle Database to Communicate with Oracle Automatic Storage Management

- Configuring Databases to Use Oracle Enterprise Manager Database Control

- Installing Oracle Database Examples

> **See Also:**
>
> - Chapter 4, "Configuration Tasks When Installing from the Database" in *Oracle Application Express Installation Guide*
>
> - "Post-installation Database Configuration" section in *Oracle Configuration Manager Installation and Administration Guide* for information about postinstallation tasks for Oracle Configuration Manager

> **Note:** You need only perform postinstallation tasks for components that you intend to use.

5.5.1 Direct NFS Client

With Oracle Database 11*g*, you can store data files on a supported NFS system. You can configure Oracle Database to access NFS V3 servers directly using an Oracle internal Direct NFS Client. If Oracle Database cannot open an NFS server using Direct NFS Client, then an informational message is logged into the Oracle alert and trace files indicating that Direct NFS Client could not be established.

Management of Oracle data files created with Direct NFS Client should be done according to the guidelines specified in *Oracle Database Administrator's Guide*. The Oracle files resident on the NFS server that are served by the Direct NFS Client can also be accessed through a third party NFS Client. The volume must be mounted through CIFS or kernel NFS to enable regular windows utilities and commands, such as copy, and so on, access the database files in the remote location. Volumes mounted through CIFS cannot be used for database file storage without configuring Direct NFS Client. The atomic write requirements required for database access are not guaranteed by CIFS protocol. Consequently, CIFS can only be used for operating system level commands, such as copy, move, and so on.

Some NFS file servers require NFS clients to connect using reserved ports. If your filer is running with reserved port checking, then you must disable it for Direct NFS Client to operate. To disable reserved port checking, consult your NFS file server documentation.

Direct NFS Client can consume upto four network paths defined for an NFS server. The Direct NFS Client performs load balancing across all specified paths. If a specified path fails, then Direct NFS Client reissues I/O commands over any remaining paths.

Direct NFS Client requires an NFS server supporting NFS read/write buffers of at least 16384 bytes.

Direct NFS Client issues writes at `wtmax` granularity to the NFS server. Direct NFS Client does not serve an NFS server with a `wtmax` less than 16384. Oracle recommends that you use the value 32768.

Use the following views for Direct NFS Client management:

- **v$dnfs_servers:** Shows a table of servers accessed using Direct NFS Client.

- **v$dnfs_files:** Shows a table of files currently open using Direct NFS Client.

- **v$dnfs_channels:** Shows a table of open network paths (or channels) to servers for which Direct NFS Client is providing files.

- **v$dnfs_stats:** Shows a table of performance statistics for Direct NFS Client.

For NFS servers that restrict port range, you can use the `insecure` option to enable clients other than `root` to connect to the NFS server. Alternatively, you can disable Direct NFS Client as described in "Disable Direct NFS Client".

> **Note:** Use NFS servers supported for Oracle Database. See the My Oracle Support website for support information:
>
> `https://support.oracle.com`

The following sections elaborate on enabling, disabling, checking the buffer size for a Direct NFS Client:

- Enable Direct NFS Client
- Disable Direct NFS Client

5.5.1.1 Enable Direct NFS Client

To enable Direct NFS Client, a new Oracle specific file `oranfstab` can be added to `ORACLE_HOME`\dbs. When `oranfstab` is placed in `ORACLE_HOME`\dbs, its entries are specific to a single database.

Direct NFS Client looks for the mount point entries in `ORACLE_HOME`\dbs\oranfstab. It uses the first matched entry as the mount point.

Complete the following procedure to enable Direct NFS Client:

1. Create an `oranfstab` file with the following attributes for each NFS server to be accessed using Direct NFS Client:

   - Server: The NFS server name.

   - Path: Up to 4 network paths to the NFS server, specified either by IP address, or by name, as displayed using the `ifconfig` command on the NFS server.

   - Local: Up to 4 network interfaces on the database host, specified by IP address, or by name, as displayed using the `ipconfig` command on the database host.

   - Export: The exported path from the NFS server. Use UNIX-style path.

   - Mount: The corresponding local mount point for the exported volume. Use WINDOWS-style path.

   - mnt_timeout: Specifies (in seconds) the time for which Direct NFS Client should wait for a successful mount before timing out. This parameter is optional and the default timeout is 10 minutes.

   - management: Enables Direct NFS Client to use the management interface for SNMP queries. You can use this parameter if SNMP is running on separate management interfaces on the NFS server. The default value is the server parameter value.

   - community: Specifies the community string for use in SNMP queries. Default value is public.

   The following is an example of an `oranfstab` file with two NFS server entries:

   ```
   server: MyDataServer1
   local: 132.34.35.10
   path: 132.34.35.12
   local: 132.34.55.10
   path: 132.34.55.12
   export: /vol/oradata1 mount: C:\APP\ORACLE\ORADATA\ORCL

   server: MyDataServer2
   local: LocalInterface1
   path: NfsPath1
   local: LocalInterface2
   path: NfsPath2
   local: LocalInterface3
   path: NfsPath3
   local: LocalInterface4
   path: NfsPath4
   export: /vol/oradata2 mount: C:\APP\ORACLE\ORADATA\ORCL2
   export: /vol/oradata3 mount: C:\APP\ORACLE\ORADATA\ORCL3
   ```

   As a rule, a mount point specified in `oranfstab` file represents local path where the database files reside normally, that is, without Direct NFS Client being enabled. For example, if a database that does not use Direct NFS Client would

have kept its files in `C:\app\oracle\oradata\orcl` directory, then `C:\app\oracle\oradata\orcl` should be specified as a virtual mount point in the corresponding `oranfstab` file.

> **Note:** On Windows platforms, two optional parameters can be specified in `oranfstab` file:
>
> - `uid`: UNIX User ID to be used by Direct NFS Client
> - `gid`: UNIX Group ID to be used by Direct NFS Client

The Direct NFS Client uses the `uid` or `gid` value to access all NFS servers listed in `oranfstab`. Direct NFS Client ignores `uid` or `gid` value of `0`. If neither `uid` nor `gid` is specified, then a default of `uid:65534, gid:65534` is used by the Direct NFS Client. The default value often corresponds to `user:nobody` and `group:nogroup` on the NFS server.

> **Note:** The exported path from the NFS server must be accessible for read, write, and execute operations by the user with the `uid, gid` specified in `oranfstab`. If neither uid nor gid is listed, then the exported path must be accessible by the user with the `uid:65534, gid:65534`.

2. Oracle Database uses an ODM library, `oranfsodm11.dll`, to enable Direct NFS Client. To replace the standard ODM library, `oraodm11.dll`, with the ODM NFS library, `oranfsodm11.dll,` complete the following steps:

   1. Change directory to *ORACLE_HOME*`\bin`.

   2. Shutdown the Oracle database.

   3. Enter the following commands:

      ```
      DRIVE_LETTER:\> copy oraodm11.dll oraodm11.dll.stub
      DRIVE_LETTER:\> copy /Y oranfsodm11.dll oraodm11.dll
      ```

5.5.1.2 Disable Direct NFS Client

Complete the following steps to disable the Direct NFS Client:

1. Log in as the Oracle Grid Infrastructure software owner.

2. Restore the stub `oraodm11.dll` file by reversing the process you completed in "Enable Direct NFS Client".

3. Remove the `oranfstab` file.

5.5.1.3 ORADNFS

ORADNFS is a utility which enables the database administrators to perform basic file operations over Direct NFS Client on Microsoft Windows platforms.

ORADNFS is a multi-call binary, a single binary that acts like several utilities. This allows ORADNFS to be smaller since all the built-in commands can leverage DNFS code for many common operations. ORADNFS is run by issuing a command as an argument on the command line.

For example, `C:\>` `ORADNFS help` causes ORADNFS to print a list of built-in commands, and `C:\>` `ORADNFS ls C:\ORACLE\ORADATA\ORCL` causes ORADNFS to

behave as an `ls` command of `C:\ORACLE\ORADATA\ORCL` remote directory, where `C:\ORACLE\ORADATA` is a DNFS virtual mount point specified in the `oranfstab` configuration file.

> **Note:**
> - A valid copy of the oranfstab configuration file must be present in *ORACLE_HOME*\dbs directory for ORADNFS to operate.
> - The user must be a member of the local ORA_DBA group to execute ORADNFS.

5.5.2 Configuring Oracle Messaging Gateway

Oracle Messaging Gateway, an Oracle Database Advanced Queuing feature, requires additional configuration after you install Oracle Database if you plan to use Oracle Database Advanced Queuing.

> **See Also:** "Loading and Setting Up Oracle Messaging Gateway" in *Oracle Streams Advanced Queuing User's Guide* to configure Oracle Messaging Gateway and for additional instructions about configuring the `listener.ora`, `tnsnames.ora`, and `mgw.ora` files

5.5.3 Configuring Oracle Administration Assistant for Windows

Oracle Administration Assistant for Windows requires the Microsoft Management Console and HTML Help 1.2 or later to run. Microsoft Management Console (MMC) version 3.0 is available with Windows 2003, Windows XP, Windows Vista, and Windows Server 2008. Oracle recommends the latest MMC version available.

> **See Also:** Microsoft documentation at
>
> http://www.microsoft.com/

5.5.4 Configuring Oracle Counters for Windows Performance Monitor

Before using Oracle Counters for Windows Performance Monitor to view Oracle-specific counters, you must specify the system password by running `operfcfg.exe`, located in the *ORACLE_HOME*\bin directory. `operfcfg.exe` prompts for a user name, password, and TNS alias.

For example:

```
DRIVE_LETTER:\> ORACLE_HOME\bin\operfcfg.exe
Enter user-name: system
Enter password: password
Enter tns-alias: orcl
operfcfg: New registry values have been successfully set.
```

If you run the following command, then `operfcfg.exe` does not prompt for a password:

```
operfcfg.exe -U user_name -D tns_alias
```

See Also:

- My Oracle Support (formerly Oracle*MetaLink*) Note 106375.1 for more details about setting credentials for Windows Performance Monitor

- *Oracle Database Platform Guide for Microsoft Windows* for additional information about Oracle Counters for Windows Performance Monitor

5.5.5 Configuring Oracle Label Security

If you installed Oracle Label Security, you must configure it in a database before you use it. You can configure Oracle Label Security with or without Oracle Internet Directory integration. If you configure Oracle Label Security without Oracle Internet Directory integration, you cannot configure it to use Oracle Internet Directory at a later stage.

> **Note:** To configure Oracle Label Security with Oracle Internet Directory integration, Oracle Internet Directory must be installed in your environment and the Oracle database must be registered in the directory.

> **See Also:** *Oracle Label Security Administrator's Guide* for more information about Oracle Label Security enabled with Oracle Internet Directory

5.5.6 Configuring Oracle Database Vault

If you installed Oracle Database Vault, you must register it in a database and create the Database Vault Owner and, optionally, Database Vault Account Manager administrative accounts before you can use it.

> **See Also:** *Oracle Database Vault Administrator's Guide* for more information about registering Oracle Database Vault

5.5.7 Configuring Oracle Net Services

If you have a previous release of Oracle software installed on this system, you can copy information from the Oracle Net `tnsnames.ora` and `listener.ora` configuration files from the previous release to the corresponding files for the new release.

> **Note:** The default location for the `tnsnames.ora` and `listener.ora` files is the `ORACLE_BASE\ORACLE_HOME`\network\admin\ directory.

Modifying the listener.ora File

If you are upgrading from a previous release of Oracle Database, Oracle recommends that you use the current release of Oracle Net listener instead of the listener from the previous release.

If you have referenced the previous Oracle home directory names in the static listener information, then these directory names must be modified before the `listener.ora` file can be used in the 11.2 environment.

To use the listener from the current release, you must copy static service information from the `listener.ora` file from the previous release to the version of that file used by the new release.

For any database instances earlier than release 8.0.3, add static service information to the `listener.ora` file. Oracle Database releases later than release 8.0.3 do not require static service information.

Modifying the tnsnames.ora File

Unless you are using a central `tnsnames.ora` file, copy Oracle Net service names and connect descriptors from the previous release `tnsnames.ora` file to the version of that file used by the new release.

If necessary, you can also add connection information for additional database instances to the new file.

5.5.8 Installing Oracle Text Supplied Knowledge Bases

An Oracle Text knowledge base is a hierarchical tree of concepts used for theme indexing, ABOUT queries, and deriving themes for document services. If you plan to use any of these Oracle Text features, you can install two supplied knowledge bases (English and French) from the Oracle Database Examples media.

> **See Also:** *Oracle Text Reference* for information about creating and extending knowledge bases, such as extending the supplied knowledge bases to accommodate your requirements, or creating your own knowledge bases in languages other than English and French

5.5.9 Installing the Oracle Text Filtering Component

Oracle Text Filtering Technology requires the Visual C++ libraries included in the Visual C++ Redistributable Package provided by Microsoft. You can download the 2005 SP1 Redistributable Package version of the `vcredist_x86.exe` file from

http://www.microsoft.com/downloads

> **See Also:** *Oracle Text Reference* for more information about Oracle Text Filtering Technology

5.5.10 Configuring or Reinstalling Oracle XML DB

See *Oracle XML DB Developer's Guide* for more information about the following tasks:

- Reinstalling Oracle XML DB
- Configuring or customizing the Oracle XML DB tablespace
- Configuring FTP, HTTP/WebDAV port numbers

> **See Also:** Appendix A of *Oracle XML DB Developer's Guide*

5.5.11 Configuring PL/SQL External Procedures

Configuring PL/SQL depends on the network configuration files used. In nearly all cases, configuration is automatic. However, if you are using pre-8.0.3 `tnsnames.ora` and `listener.ora` files with your 11*g* Release 2 (11.2) database, you must manually configure them.

> **See Also:** "Developing Applications for Windows" of *Oracle Database Platform Guide for Microsoft Windows*

5.5.12 Configuring Shared Server Support

The default setup for using Shared Server mode depends on how the software has been installed. If you installed Oracle Database through the Enterprise Edition, Standard Edition, or Personal Edition installation types, then shared support was *not* configured. If you created your database through Oracle Database Configuration Assistant, then you were offered a choice of shared or dedicated server support.

> **See Also:** "Postinstallation Configuration Tasks on Windows" of *Oracle Database Platform Guide for Microsoft Windows*

5.5.13 Setting Credentials for the Job System to Work with Oracle Enterprise Manager

Windows systems require that you set the correct credentials for the Jobs system to work properly in Oracle Enterprise Manager. By default, the Management Agent service is installed as a `LocalSystem` user. When submitting jobs, such as stopping or starting the database, the operating system user submitting the job must have the **Log on as a batch job** privilege enabled.

Perform the following steps to establish that privilege for any operating system user who must submit an Oracle Enterprise Manager job.

1. Start the **Local Security Policy** tool:

    - **Windows 2003:** From the **Start** menu, select **Administrative Tools**, then **Local Security Policy**.

    - **Windows XP:** From the **Start** menu, select **Control Panel**, **Administrative Tools**, then **Local Security Policy**.

    - **Windows Vista and Windows Server 2008:** From the **Start** menu, select **Programs**, **Administrative Tools,** then **Local Security Policy.**

2. Under the Security Settings list, expand the list to **Local Policies**.

3. Under Local Policies, double-click **User Rights Assignment**.

4. Under Policy, search for the **Log on as a batch job** policy.

    If the Management Agent service is installed as any other user (that is, not `LocalSystem`), then, in addition to granting the **Log on as a batch job** privilege, you must grant the "Windows service" user the following three privileges:

    - **Act as part of the operating system**

    - **Adjust memory quotas for a process**

    - **Replace a process level token**

        The service under the "Windows service" user runs at the operating system level.

5. With each policy, perform the following steps:

    a. Double-click the policy name.

    b. In the Properties dialog box, click **Add User or Group**.

    c. In the Select Users or Groups dialog box, enter the name of the user (for example, `jsmith`, `administrator`, and so on.)

> **Note:** On Windows Vista and Windows Server 2008, the name of the dialog box is Select Users, Computers, or Groups.

    d. Click **Check Names** to check that you have entered the name correctly.

    e. Click **OK**.

6. Click **OK** to exit the Properties dialog box, then exit Local Security Settings and Administrative Tools.

7. Restart your computer.

If a user exists locally and at the domain level, Windows gives the local user precedence. To use the domain user, qualify the user name with the domain name. For example, to use the user `joe` in the `ACCOUNTS` domain specify the user name as `ACCOUNTS\joe`.

5.5.14 Configuring Oracle Database to Communicate with Oracle Automatic Storage Management

On Windows, Oracle Database installations that use Oracle Automatic Storage Management must use Windows native authentication. By default, Windows native authentication is enabled. To ensure that it is, check the **sqlnet.ora file**, by default located in `ORACLE_HOME\network\admin`, and ensure that it has NTS enabled. For example:

```
sqlnet.authentication_services=(NTS)
```

> **See Also:** *Oracle Database Platform Guide for Microsoft Windows* for more information about Windows native authentication

5.5.15 Configuring Databases to Use Oracle Enterprise Manager Database Control

You have the option to configure Oracle Enterprise Manager Database Control automatically when creating a new database using Database Control Assistant. This lets you administer your entire database using Enterprise Manager Database Control.

> **See Also:** *Oracle Enterprise Manager Grid Control Advanced Installation and Configuration Guide* for information about configuring a database to use Database Control

5.5.16 Installing Oracle Database Examples

If you plan to use the following products or features, then download and install the products from the Oracle Database Examples media:

- Oracle Database Examples
- Oracle JDBC Development Drivers
- Oracle Text Knowledge Base

> **See Also:** *Oracle Database Examples Installation Guide* for detailed information about various Oracle product demonstrations

5.6 Creating a Fast Recovery Area Disk Group

During installation, by default you can create one disk group. If you plan to add an Oracle Database for a standalone server, then you should create the fast recovery area for database files.

5.6.1 About the Fast Recovery Area and the Fast Recovery Area Disk Group

The fast recovery area is a unified storage location for all Oracle Database files related to recovery. Database administrators can define the `DB_RECOVERY_FILE_DEST_SIZE_ SIZE` parameter to the path for the fast recovery area to enable on-disk backups, and rapid recovery of data. Enabling rapid backups for recent data can reduce requests to system administrators to retrieve backup tapes for recovery operations.

When you enable fast recovery in the `init.ora` file, it writes all RMAN backups, archive logs, control file automatic backups, and database copies to the fast recovery area. RMAN automatically manages files in the fast recovery area by deleting obsolete backups and archive files no longer required for recovery.

Oracle recommends that you create a fast recovery area disk group. Oracle Clusterware files and Oracle Database files can be placed on the same disk group, and you can also place fast recovery files in the same disk group. However, Oracle recommends that you create a separate fast recovery disk group to reduce storage device contention.

The fast recovery area is enabled by setting `DB_RECOVERY_FILE_DEST_SIZE`. The size of the fast recovery area is set with `DB_RECOVERY_FILE_DEST_SIZE`. As a general rule, the larger the fast recovery area, the more useful it becomes. For ease of use, Oracle recommends that you create a fast recovery area disk group on storage devices that can contain at least three days of recovery information. Ideally, the fast recovery area should be large enough to hold a copy of all of your datafiles and control files, the online redo logs, and the archived redo log files needed to recover your database using the datafile backups kept under your retention policy.

Multiple databases can use the same fast recovery area. For example, assume you have created one fast recovery area disk group on disks with 150 GB of storage, shared by three different databases. You can set the size of the fast recovery for each database depending on the importance of each database. For example, if `database1` is your least important database, `database2` is of greater importance and `database3` is of greatest importance, then you can set different `DB_RECOVERY_FILE_DEST_SIZE` settings for each database to meet your retention target for each database: 30 GB for `database1`, 50 GB for `database2`, and 70 GB for `database3`.

5.6.2 Creating the Fast Recovery Area Disk Group

To create a fast recovery file disk group:

1. Navigate to the Grid home bin directory, and start ASM Configuration Assistant (ASMCA). For example:

   ```
   DRIVE_LETTER:\> cd \app\oracle\product\11.2.0\grid\bin
   DRIVE_LETTER:\> asmca
   ```

2. ASMCA opens at the Disk Groups tab. Click **Create** to create a disk group.

3. The Create Disk Groups window opens.

   In the Disk Group Name field, enter a descriptive name for the fast recovery area group. For example: `FRA`.

In the Redundancy section, select the level of redundancy you want to use.

In the Select Member Disks field, select eligible disks to be added to the fast recovery area, and click **OK**.

4. The Diskgroup Creation window opens to inform you when disk group creation is complete. Click **OK**.

5. Click **Exit**.

> **See Also:**
> - "Setting the Fast Recovery Area Location and Initial Size" section in *Oracle Database Backup and Recovery User's Guide*
> - *Oracle Automatic Storage Management Administrator's Guide*

5.7 Enabling and Disabling Database Options

When you install Oracle Database, certain options are enabled and others are disabled. If you must enable or disable a particular database feature for an Oracle home, then shut down the database and use the `chopt` tool. See Example 5–1.

The `chopt` tool is a command-line utility that is located in the `ORACLE_HOME`\bin directory. The syntax for `chopt` is as follows:

```
chopt [ enable | disable] db_option
```

The possible values for `db_option` described in the following table.

Value	Description
dm	Oracle Data Mining RDBMS Files
dv	Oracle Database Vault
lbac	Oracle Label Security
olap	Oracle OLAP
partitioning	Oracle Partitioning
rat	Oracle Real Application Testing
ode_net_2	Oracle Database Extensions for .NET 2.0

Example 5–1   Complete Example of Running the Chopt Tool

To enable the Oracle Label Security option in your Oracle binary files:

1. Shut down the database with `srvctl` or SQL*Plus:

   ```
   srvctl stop database -d myDb
   ```
2. Stop the database service, `OracleServiceSID`, using the Services program in Control Panel.

3. Run the following commands:

   ```
   cd %ORACLE_HOME%/bin
   chopt enable lbac
   ```

4. Start the database service, `OracleServiceSID`, using the Services program in Control Panel.

5. Start up the database:

```
srvctl start database -d myDb
```

6

Getting Started with Oracle Database

This chapter describes where to go after you have completed an Oracle Database installation, such as how to check the installed contents, start various tools, and identify and locate various files. It covers these topics:

- Checking the Installed Oracle Database Contents and Directory Location
- Logging in to Enterprise Manager Database Control
- Managing Oracle Automatic Storage Management
- Starting and Stopping an Oracle Database
- Accessing Oracle Database with SQL*Plus
- Accessing Oracle Database with Oracle SQL Developer
- Reviewing User Accounts and Passwords
- Identifying Databases
- Locating the Server Parameter File
- Identifying Tablespaces and Data Files
- Locating Redo Log Files
- Locating Control Files
- Understanding Oracle Database Services on Windows

6.1 Checking the Installed Oracle Database Contents and Directory Location

Use Oracle Universal Installer to check the contents and directory location of your Oracle Database installation.

Follow these steps:

1. From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Oracle Installation Products**, then **Universal Installer**.

2. In the Welcome window, click **Installed Products** to display the Inventory dialog box.

3. To check the installed contents, find the Oracle Database product in the list.

   To find additional information about an installed product, click **Details**.

4. To check the directory location of the installed contents, click the **Environment** tab.

5. Click **Close** to exit the Inventory dialog box.

6. Click **Cancel** to exit Oracle Universal Installer, then click **Yes** to confirm.

6.2 Logging in to Enterprise Manager Database Control

Oracle Enterprise Manager Database Control provides a Web-based user interface that you can use to monitor, administer, and maintain an Oracle database, including Oracle Automatic Storage Management.

To log in to Oracle Enterprise Manager Database Control:

1. Open your Web browser and enter the following URL:

```
https://hostname:port/em
```

In a default installation, the port number is 1158. If you are unsure of the correct port number to use, look for the following line in the `ORACLE_HOME\install\portlist.ini` file:

```
Enterprise Manager Console HTTP Port (dbhome_name) = port
```

Note: The `portlist.ini` file is not updated if you change a port number after you install Oracle Database. "Changing the Oracle Enterprise Manager Database Control Ports" on page E-3 explains how to find the Oracle Enterprise Manager Database Control port number in this situation.

For example, if you installed the database on a host computer named `mgmt42`, and the port number listed in the `portlist.ini` file is 5500, then enter the following URL:

```
http://mgmt42:5500/em
```

Enterprise Manager displays the Database Control Login Page.

2. Log in to the database using the user name `SYSTEM` and connect as `SYSDBA`. Enterprise Manager displays the Database Home page.

Use the password that you specified for the `SYSTEM` account during the installation.

Note: You can also log in to the Database Control using the `SYS`, `SYSTEM`, or `SYSMAN` accounts or you can grant login privileges to other database users.

6.2.1 Understanding Database Control Login Privileges

When you log in to Oracle Enterprise Manager Database Control using the `SYSMAN` user account, you are logging in as the Oracle Enterprise Manager super user. The `SYSMAN` account is automatically granted the roles and privileges required to access all the management functionality provided with Database Control.

You can also use the `SYS` and `SYSTEM` accounts to log in to Database Control. In addition, you can grant login privileges to other database users. To grant management access for other database users, use the following procedure:

1. Log in to Database Control.

2. Click **Setup** at the top of the Database Control Home page.

3. Click **Administrators** in the left navigation bar.

4. Click **Create** to create an Enterprise Manager user.

5. In the **Name** field, enter the user name of an existing database user, or click the flashlight icon and select a user from the pop-up window.

6. Enter the password for this user, then click **Review**.

7. On the properties page, click **Finish.**

Enterprise Manager assigns login privileges to the specified user and includes this user in the list of Enterprise Manager users on the Setup Administrators page.

To enable a nonadministrative user to log in to Database Control, the user must be granted the SELECT ANY DICTIONARY system privilege.

6.3 Managing Oracle Automatic Storage Management

This section covers the following topics:

- Starting and Stopping Oracle Automatic Storage Management
- Oracle Automatic Storage Management Utilities

6.3.1 Starting and Stopping Oracle Automatic Storage Management

To start and stop Oracle Automatic Storage Management, in addition to using SQL*Plus, you can use the srvctl utility.

To start Oracle Automatic Storage Management instance using the srvctl utility, run the following command:

```
srvctl start asm
```

To stop Oracle Automatic Storage Management instance using the srvctl utility, run the following command:

```
srvctl stop asm
```

> **See Also:** *Oracle Automatic Storage Management Administrator's Guide* for information about starting and stopping Oracle Automatic Storage Management instances by using SQL*Plus

6.3.2 Oracle Automatic Storage Management Utilities

To manage Oracle Automatic Storage Management, you can use the following tools:

- asmcmd: This command-line tool lets you manage Oracle Automatic Storage Management disk group files and directories.
- asmtool: This command-line tool is required to stamp the disks to create or modify disk groups later on after the database installation.
- Oracle Automatic Storage Management Configuration Assistant: Oracle Automatic Storage Management Configuration Assistant (ASMCA) is an interactive utility that enables you to create an Oracle Automatic Storage Management instance or upgrade existing Oracle Automatic Storage Management

instances. It also enables you to create and configure disk groups, Oracle Automatic Storage Management volumes and Oracle Automatic Storage Management File Systems (ASMFS).

- Oracle Enterprise Manager Grid Control: If you have Oracle Enterprise Manager installed, you can use Grid Control to manage Oracle Automatic Storage Management functions such as migrating an existing database to Oracle Automatic Storage Management, checking the status of the Oracle Automatic Storage Management instance, checking the performance of the Oracle Automatic Storage Management disk groups, creating or dropping Oracle Automatic Storage Management disk groups, and so on.

- Oracle Enterprise Manager Database Control: This utility lets you perform functions similar to Grid Control.

- SQL*Plus: You can use Oracle Automatic Storage Management-specific commands from this tool. To connect to the Oracle Automatic Storage Management instance, you use the same methods that you use to connect to an Oracle Database instance.

> **See Also:**
>
> - "Logging in to Enterprise Manager Database Control" on page 6-2
> - *Oracle Automatic Storage Management Administrator's Guide* for more information about managing Oracle Automatic Storage Management
> - *Oracle Database Utilities* for more information about the `asmcmd` utility

6.4 Starting and Stopping an Oracle Database

You can start and stop an Oracle database by using any of the following methods:

- Starting and Stopping the Database with Oracle Enterprise Manager Database Control

- Starting and Stopping the Database with Oracle Administration Assistant for Windows

- Starting and Stopping the Database from the Microsoft Windows Services Utility

6.4.1 Starting and Stopping the Database with Oracle Enterprise Manager Database Control

To start or stop the database:

1. From a Web browser, start Enterprise Manager Database Control and log in, for example:

   ```
   http://myserver:1158/em
   ```

   > **See Also:** "Logging in to Enterprise Manager Database Control" on page 6-2

2. Click **Home** to go to the home page.

3. Under General, click **Start** to start the database or click **Shutdown** to shut it down.

6.4.2 Starting and Stopping the Database with Oracle Administration Assistant for Windows

To start or stop the database:

1. From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Configuration and Migration Tools**, and then **Administrative Assistant for Windows**.

2. In the console window, expand the Oracle Administration Assistant for Windows tree structure.

3. Under Databases, right-click the name of the database, and from the menu, select from the following options:

    -   **Connect Database**

    -   **Start Service**

    -   **Disconnect Database**

    -   **Stop Service**

    -   **Startup/Shutdown Options**

    -   **Process Information**

6.4.3 Starting and Stopping the Database from the Microsoft Windows Services Utility

You can use SQL or `srvctl` utility to start or stop the database instance. SRVCTL starts the service automatically.

To use SQL to start the database instance, start the Windows services:

1. From the **Start** menu, select **All Programs**, then **Administrative Tools**, and then **Services**.

2. In the Services dialog box, locate the name of the database you want to start or stop.

3. Right-click the name of the database, and from the menu, select either **Start**, **Stop**, or **Pause**.

    To set its startup properties, right-click **Properties**, and in the dialog box, select either **Automatic**, **Manual**, or **Disabled** from the Startup type list.

6.5 Accessing Oracle Database with SQL*Plus

To issue SQL and PL/SQL statements to Oracle Database, you can use SQL*Plus. This tool enables you to perform the same database management operations, and query, insert, update, or delete data directly in the database.

To start SQL*Plus, from the Start menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Application Development**, and then **SQL Plus**.

Alternatively, at the command line, you can enter the following command at a Windows command prompt:

```
C:\> sqlplus /nolog
SQL> CONNECT user_name
Enter password: password
```

For example, to log on as SYSTEM using the password *password*, you enter:

```
C:\> sqlplus /nolog
SQL> CONNECT SYSTEM
Enter password: password
```

If you are logging on as `SYS`, you must connect as `SYSDBA`:

```
C:\> sqlplus /nolog
SQL> CONNECT SYS AS SYSDBA
Enter password: password
```

> **See Also:**
>
> - *SQL*Plus User's Guide and Reference*
> - *SQL*Plus Quick Reference*
> - *Oracle Database Administrator's Guide* for more information about accessing Oracle Database using SQL*Plus

6.6 Accessing Oracle Database with Oracle SQL Developer

To issue SQL and PL/SQL statements to Oracle Database, you can use SQL Developer. All SQL and PL/SQL commands are supported as they are passed directly from the SQL Worksheet to the Oracle Database.

To start SQL Developer:

1. From the **Start** menu, select **All Programs**, then **Oracle - *HOME_NAME***, then **Application Development**, and then **SQL Developer**.

2. If you are asked to enter the full path name for java.exe, click **Browse** and find `java.exe`. For example, `C:\Program Files\Java\jdk1.6.0_06\bin\java.exe`.

3. Once SQL Developer starts, perform the following steps:

   - Right-click **Connections.**
   - Select **New Connection**.
   - In the New/Select Database Connection dialog box, enter a Connection name, username, password, and for the host string, the name of the database to which you want to connect.
   - Click **Connect.**

Once connected, you can view, create, modify, and delete the database objects using the Connection Navigator or issue any SQL or PL/SQL command using a SQL Worksheet (From the **Tools** menu, select **SQL Worksheet**).

SQL*Plus commands have to be interpreted by the SQL Worksheet before being passed to the database. The SQL Worksheet currently supports many SQL*Plus commands. SQL*Plus commands which are not supported by the SQL Worksheet are ignored and are not sent to the Oracle Database.

> **See Also:** "SQL*Plus Statements Supported and Not Supported in SQL Worksheet" in *Oracle Database SQL Developer User's Guide*

6.7 Reviewing User Accounts and Passwords

All databases created by Oracle Database Configuration Assistant include the `SYS`, `SYSTEM`, `SYSMAN`, and `DBSNMP` database accounts. In addition, Oracle provides several

other administrative accounts. Before using these other accounts, you must unlock them and reset their passwords. This section covers the following topics:

- Reviewing Administrative Accounts
- Unlocking and Resetting User Passwords

> **See Also:**
>
> - "Unlocking and Resetting User Passwords" on page 6-9 for information about using Oracle Enterprise Manager Database Control to view a complete list of the user accounts defined for your database
> - "Modifying Oracle Counters for Windows Performance Monitor Parameters" in *Oracle Database Platform Guide for Microsoft Windows* for instructions on how to change the password for Oracle Counters for Windows Performance Monitor
> - *Oracle Database Administrator's Guide* for information about Oracle security procedures and security best practices

6.7.1 Reviewing Administrative Accounts

Table 6–1 describes the administrative user names.

Table 6–1 Administrative Accounts

User Name	Description	See Also
ANONYMOUS	Allows HTTP access to Oracle XML DB.	*Oracle XML DB Developer's Guide*
APEX_030200	The account owns the Oracle Application Express schema and metadata.	*Oracle Application Express Application Builder User's Guide*
APEX_PUBLIC_USER	The minimally privileged account used for Oracle Application Express configuration with Oracle HTTP Server and mod_plsql.	*Oracle Application Express Application Builder User's Guide*
APPQOSSYS	Used for storing or managing all data and metadata required by Oracle Quality of Service Management.	None
BI	Owns the Business Intelligence schema included in the Oracle Sample Schemas. It is only available if you loaded the Sample Schemas.	*Oracle Database Sample Schemas*
CTXSYS	The Oracle Text account.	*Oracle Text Reference*
DBSNMP	Used by Management Agent of Oracle Enterprise Manager to monitor and manage the database.	*Oracle Enterprise Manager Grid Control Basic Installation Guide*
DIP	Used by Directory Integration Platform (DIP) to synchronize the changes in Oracle Internet Directory with the applications in the database.	None

Table 6–1 (Cont.) Administrative Accounts

User Name	Description	See Also
DVSYS	There are two roles associated with this account. Database Vault owner role manages the Database Vault roles and configurations. The Database Vault Account Manager is used to manage database user accounts. **Note**: Part of Oracle Database Vault user interface text is stored in database tables in the DVSYS schema. By default, only the English language is loaded into these tables. You can use Oracle Database Vault Configuration Assistant to add more languages to Oracle Database Vault. For the necessary steps, refer to Appendix C in *Oracle Database Vault Administrator's Guide*	*Oracle Database Vault Administrator's Guide*
EXFSYS	Owns the Expression Filter schema.	None
FLOWS_FILES	The account owns the Oracle Application Express uploaded files.	*Oracle Application Express Application Builder User's Guide*
HR	Owns the Human Resources schema included in the Oracle Sample Schemas. It is available only if you loaded the Sample Schemas.	*Oracle Database Sample Schemas*
IX	Owns the Information Transport schema included in the Oracle Sample Schemas. This account is available only if you loaded the Sample Schemas.	*Oracle Database Sample Schemas*
LBACSYS	The Oracle Label Security administrator account.	*Oracle Label Security Administrator's Guide*
MDDATA	Used by Oracle Spatial for storing Geocoder and router data.	*Oracle Spatial Developer's Guide*
MDSYS	The Oracle Spatial and Oracle Multimedia Locator administrator account.	*Oracle Spatial Developer's Guide*
MGMT_VIEW	Used by Oracle Enterprise Manager Database Control.	None
OE	Owns the Order Entry schema included in the Oracle Sample Schemas. This account is available only if you loaded the Sample Schemas.	*Oracle Database Sample Schemas*
ORACLE_OCM	This account contains the instrumentation for configuration collection used by the Oracle Configuration Manager.	*Oracle Configuration Manager Installation and Administration Guide*
ORDDATA	This account contains the Oracle Multimedia DICOM data model.	*Oracle Multimedia DICOM Developer's Guide*
ORDPLUGINS	The Oracle Multimedia user. Plug-ins supplied by Oracle and third party plug-ins are installed in this schema.	*Oracle Multimedia Reference*
ORDSYS	The Oracle Multimedia administrator account.	*Oracle Multimedia Reference*
OUTLN	Centrally manages metadata associated with stored outlines. Supports plan stability, which enables maintenance of the same execution plans for the same SQL statements.	*Oracle Database Performance Tuning Guide*
OWBSYS	The account used by Oracle Warehouse Builder as its default repository. You must unlock this account after installing the Oracle Database and before starting the Warehouse Builder Repository Assistant.	*Oracle Warehouse Builder Installation and Administration Guide for Windows and Linux*

Table 6–1   (Cont.) Administrative Accounts

User Name	Description	See Also
PM	Owns the Product Media schema included in the Oracle Sample Schemas. This account is created only if you loaded the Sample Schemas.	*Oracle Database Sample Schemas*
SCOTT	An account used by Oracle sample programs and examples.	*Oracle Database Administrator's Guide*
SH	Owns the Sales History schema included in the Oracle Sample Schemas. This account is available only if you loaded the Sample Schemas during an Enterprise Edition installation	*Oracle Database Sample Schemas*
SI_INFORMTN_SCHEMA	Stores the information views for the SQL/MM Still Image Standard.	*Oracle Multimedia Reference*
SPATIAL_CSW_ADMIN_ USR	The Catalog Services for the Web (CSW) account. It is used by the Oracle Spatial CSW cache manager to load all record type metadata and all record instances from the database into main memory for the record types that are cached.	*Oracle Spatial Developer's Guide*
SPATIAL_WFS_ADMIN_ USR	The Web Feature Service (WFS) account. It is used by the Oracle Spatial WFS cache manager to load all feature type metadata and all feature instances from the database into main memory for the feature types that are cached.	*Oracle Spatial Developer's Guide*
SYS	Used for performing database administration tasks.	*Oracle Database Administrator's Guide*
SYSMAN	The account used to perform Oracle Enterprise Manager database administration tasks.	*Oracle Enterprise Manager Grid Control Basic Installation Guide*
SYSTEM	Used for performing database administration tasks.	*Oracle Database Administrator's Guide*
WMSYS	The account used to store the metadata information for Oracle Workspace Manager.	*Oracle Database Workspace Manager Developer's Guide*
XDB	Used for storing Oracle XML DB data and metadata.	*Oracle XML DB Developer's Guide*

See Also:

- "Database Users and Schemas" of *Oracle Database Concepts*
- "Database Administrator Usernames" of *Oracle Database Administrator's Guide*
- "Administering External Users and Roles on Windows" of *Oracle Database Platform Guide for Microsoft Windows*

6.7.2 Unlocking and Resetting User Passwords

Passwords for all Oracle system administration accounts except SYS, SYSTEM, SYSMAN, and DBSNMP are revoked after installation. Before you use a locked account, you must unlock it and reset its password. If you created a starter database during the installation, Oracle Database Configuration Assistant displays a screen with your database information and the Password Management button. Use the Password Management button and unlock only the user names you use.

Apply the following guidelines when specifying passwords:

- Passwords must be between 8 and 30 characters long.

- Passwords must not start with a numeral.

- Password cannot contain invalid characters: ! @ % ^ & * ( ) + = \ | ` ~ [{] } ; : ' " , < > ?

- Passwords must not be the same as the user name.

- Passwords must not be Oracle reserved words.

- The `SYS` account password cannot be `change_on_install`. (case-insensitive)

- The `SYSTEM` account password cannot be `manager`. (case-insensitive)

- The `SYSMAN` account password cannot be `sysman`. (case-insensitive)

- The `DBSNMP` account password cannot be `dbsnmp`. (case-insensitive)

- If you choose to use the same password for all the accounts, then that password cannot be `change_on_install`, `manager`, `sysman`, or `dbsnmp`. (case-insensitive)

- Passwords must have at least one alphabetic, one numeric, and one special character.

- Passwords must not be simple or obvious words, such as `welcome`, `account`, `database`, and `user`.

If you created a starter database during the installation, but you did not unlock the required account, then unlock the account using one of the following methods:

- Using Enterprise Manager Database Control to Unlock and Change Passwords

- Using SQL*Plus to Unlock and Change Passwords

> **See Also:** *Oracle Database Administrator's Guide* for more information about:
>
> - Unlocking and changing passwords after installation
>
> - Oracle security procedures
>
> - Security best practices

6.7.2.1 Using Enterprise Manager Database Control to Unlock and Change Passwords

To unlock and reset user account passwords with Oracle Enterprise Manager Database Control:

1. Log in to Database Control.

   > **See Also:** "Logging in to Enterprise Manager Database Control" on page 6-2

2. Click **Schema**.

3. In the Users and Privileges section of the Schema page, click **Users**.

   Enterprise Manager displays a table containing all database accounts. The Account Status column indicates whether the account is locked and whether the password is expired.

4. Select the user account you want to modify, then click **Edit**.

5. Use the General page of the Users property sheet to change the password and lock or unlock the selected account. Click **Help** for additional information.

6.7.2.2 Using SQL*Plus to Unlock and Change Passwords

Use SQL*Plus to unlock accounts and change passwords any time after the installation process.

To change a password after installation:

1. Start SQL*Plus:

    ```
    C:\> sqlplus /nolog
    ```

2. Connect as SYSDBA:

    ```
    SQL> CONNECT SYS AS SYSDBA
    Enter password: SYS_password
    ```

3. Enter a command similar to the following, where *account* is the user account to unlock and *password* is the new password:

    ```
    SQL> ALTER USER account IDENTIFIED BY password ACCOUNT UNLOCK;;
    ```

    In this example, the ACCOUNT UNLOCK clause unlocks the account.

6.8 Identifying Databases

The Oracle Database 11*g* software identifies a database by its global database name. A global database name consists of the database name and database domain. Usually, the database domain is the same as the network domain, but it need not be. The global database name uniquely distinguishes a database from any other database in the same network. You specify the global database name when you create a database during the installation, or when using Oracle Database Configuration Assistant.

The database name input field is used to set the DB_NAME, DB_UNIQUE_NAME, and DB_DOMAIN Oracle initialization parameter values.

For example:

```
sales_world.example.com
```

In this example:

- sales_world is the name of the database. The database name (*DB_UNIQUE_NAME*) portion is a string of no more than 30 characters that can contain alphanumeric, underscore (_), dollar ($), and pound (#) characters but must begin with an alphabetic character. No other special characters are permitted in a database name.

- sales_wo is the DB_NAME. The DB_NAME initialization parameter specifies a database identifier of up to eight characters.

- example.com is the network domain in which the database is located. Together, the database name and the network domain make the global database name unique. The domain portion is a string of no more than 128 characters that can contain alphanumeric, underscore (_), and pound (#) characters. The DB_DOMAIN initialization parameter specifies the domain name.

The DB_UNIQUE_NAME parameter and the DB_DOMAIN name parameter combine to create the global database name value assigned to the SERVICE_NAMES parameter in the initialization parameter file.

The System Identifier (SID) identifies a specific database instance. The SID uniquely distinguishes the instance from any other instance on the same computer. Each database instance requires a unique SID and database name.

For example, if the SID and database name for an Oracle database are ORCL, then each database file is located in the *ORACLE_BASE*\oradata\orcl directory, and the initialization parameter file is located in the *ORACLE_BASE*\admin\orcl\pfile directory.

> **See Also:** "DB_UNIQUE_NAME" and "DB_NAME" in *Oracle Database Reference*

6.9 Locating the Server Parameter File

The starter database contains one database initialization parameter file. The initialization parameter file, init.ora.*xxxxx*, must exist for an instance to start. A parameter file is a text file that contains a list of instance configuration parameters. The starter database init.ora file has preconfigured parameters. You must not edit this file to use the starter database.

The server parameter file (SPFILE) is created from the initialization parameter file, then the initialization parameter file is renamed. The SPFILE file name is spfile*SID*.ora and is located in the *ORACLE_HOME*\database directory.

You can use Oracle Enterprise Manager Database Control to view the location of the server parameter file and list all of the initialization parameters, as follows:

1. Log in to Database Control.

2. Click **Server**.

   > **See Also:** "Logging in to Enterprise Manager Database Control"

3. In the Database Configuration section of the Server page, click **All Initialization Parameters**.

   Database Control displays a table listing the current value of each initialization parameter.

4. Click **SPFile**.

   Database Control displays a table listing the value of each initialization parameter specified in the server parameter file. The location of the server parameter file is displayed before the table.

   > **See Also:**
   >
   > - "Oracle Database Specifications for Windows" of *Oracle Database Platform Guide for Microsoft Windows* for a list of Oracle Database-specific initialization parameters for Windows and their default values
   > - *Oracle Database Reference* for more information about initialization parameters

6.10 Identifying Tablespaces and Data Files

An Oracle Database is divided into smaller logical areas of space known as tablespaces. Each tablespace corresponds to one or more physical data files. Data files contain the contents of logical database structures such as tables and indexes. A data file can be associated with only one tablespace and database.

> **Note:** The SYSAUX and SYSTEM tablespaces must be present in all Oracle Database 11*g* Release 2 (11.2) databases.

Table 6–2 list the tablespaces and data files in the Oracle Database. By default, the data files are located in the `ORACLE_BASE`\oradata\`DB_NAME` directory.

Table 6–2   Tablespaces and Data Files

Tablespace	Data File	Description
EXAMPLE	EXAMPLE01.DBF	Stores the Sample Schemas, if you included them.
SYSAUX	SYSAUX01.DBF	Serves as an auxiliary tablespace to the SYSTEM tablespace. Some products and options that previously used the SYSTEM tablespace now use the SYSAUX tablespace to reduce the load on the SYSTEM tablespace.
SYSTEM	SYSTEM01.DBF	Stores the data dictionary, including definitions of tables, views, and stored procedures needed by the Oracle Database. Information in this area is maintained automatically.
TEMP	TEMP01.DBF	Stores temporary tables and indexes created during the processing of your SQL statement. If you run a SQL statement that involves a lot of sorting, such as the constructs GROUP BY, ORDER BY, or DISTINCT, then you must expand this tablespace.
UNDOTBS	UNDOTBS01.DBF	Stores undo information. The **undo tablespace** contains one or more undo segments that maintain transaction history that is used to roll back, or undo, changes to the database.
		All starter databases are configured to run in automatic undo management mode.
USERS	USERS01.DBF	Stores database objects created by database users.

To use Oracle Enterprise Manager Database Control to view the list of datafiles currently available in your database:

1. Log in to Database Control.

    See Also: "Logging in to Enterprise Manager Database Control"

2. Click **Server**.

3. In the Storage section of the Server page, click **Datafiles**.

    Enterprise Manager displays a table listing each data file, and the tablespace with which it is associated. For more information about using Database Control to view, modify, and create tablespaces, click **Help**.

    See Also:

    - "Tablespaces, Data Files, and Control Files" of *Oracle Database Concepts*

    - "Managing Tablespaces" and "Managing Data Files and Tempfiles" of *Oracle Database Administrator's Guide*

    - "Managing the Undo Tablespace" of *Oracle Database Administrator's Guide*

6.11 Locating Redo Log Files

The preconfigured database contains two control files located in the `ORACLE_BASE`\oradata\`DB_NAME` directory. Oracle recommends that you keep at least two

control files (on separate physical drives) for each database, and set the `CONTROL_FILES` initialization parameter to list each control file.

A control file is an administrative file. Oracle Database 11*g* requires a control file to start and run the database. The control file defines the physical structure of the database. For example, it defines the database name and the names and locations of the database data files and redo log files.

To use Oracle Enterprise Manager Database Control to view or modify the redo log files for your starter database:

1. Start your Web browser and log in to Database Control.

   See Also: "Logging in to Enterprise Manager Database Control"

2. Click **Server**.

3. In the Storage section of the Server page, click **Redo Log Groups**.

   Enterprise Manager displays a table containing the control files currently defined for this database instance.

4. To view the name and location of the redo log file associated with a particular group, select that group then click **View**.

   For more information about using Database Control to view, modify, and create tablespaces, click **Help**.

   See Also:

   - *Oracle Database Backup and Recovery User's Guide*
   - "Managing Archived Redo Logs" in *Oracle Database Administrator's Guide*

6.12 Locating Control Files

The preconfigured database contains two control files located in the `ORACLE_BASE\oradata\`*DB_NAME* directory. Oracle recommends that you keep at least two control files (on separate physical drives) for each database, and set the `CONTROL_FILES` initialization parameter to list each control file.

A control file is an administrative file required to start and run the database. The control file records the physical structure of the database. For example, a control file contains the database name, and the names and locations of the database data files and redo log files.

To use Oracle Enterprise Manager Database Control to view or modify the control files for your starter database:

1. Log in to Database Control.

   See Also: "Logging in to Enterprise Manager Database Control"

2. Click **Server.**

3. In the Storage section of the Server page, click **Control files**.

   Enterprise Manager displays a table containing the control files currently defined for this database instance. For more information about using control files and backing up control files, click **Help**.

> **See Also:** "Managing Control Files" of *Oracle Database Administrator's Guide* for information about setting this initialization parameter value

6.13 Understanding Oracle Database Services on Windows

Two main Oracle services are automatically started after installation when you create a database:

- `OracleServiceSID` (Oracle Database service)

- `OracleHOME_NAMETNSListener` (Oracle Database listener service)

If you installed Oracle Enterprise Manager Database Control, then the `OracleDBConsoleSID` service is automatically started. In you configured Oracle Automatic Storage Management, the `OracleOHService` and `OracleASMService+ASM` services are listed as well. However, other services for networking or other individual components may not automatically start.

7

Removing Oracle Database Software

This chapter describes how to completely remove Oracle software and configuration files related to the specified Oracle home

The `deinstall` command removes standalone Oracle Database installations, Oracle Clusterware and Oracle Automatic Storage Management (Oracle ASM) from your server, as well as Oracle Real Application Clusters (Oracle RAC) and Oracle Database client installations.

Starting with Oracle Database 11*g* Release 2 (11.2), Oracle recommends that you use the deinstallation tool to remove the entire Oracle home associated with the Oracle Database, Oracle Clusterware, Oracle ASM, Oracle RAC, or Oracle Database client installation. Oracle does not support the removal of individual products or components.

> **See Also:**   *Oracle Grid Infrastructure Installation Guide* and *Oracle Real Application Clusters Installation Guide* for information about removing an Oracle RAC installation.
>
> The "Dropping Disk Groups" section in the *Oracle Automatic Storage Management Administrator's Guide* for information about removing an Oracle Automatic Storage Management disk group.

The following sections describe the tool, and provide information about additional options to use the tool:

- About the Deinstallation Tool

- Downloading the Deinstall Tool for Use with Failed Installations

- Example of Running the Deinstall Command

- Example of a Deinstallation Parameter File for an Oracle Database

- Example of a Deinstallation Parameter File for Oracle Grid Infrastructure

> **Caution:**   If you have a standalone database on a node in a cluster and you have multiple databases with the same global database name (GDN), then you cannot use the deinstall tool to remove one database only.

7.1 About the Deinstallation Tool

The Deinstallation Tool (`deinstall`) is available in the installation media before installation, and is available in Oracle home directories after installation. It is located in *ORACLE_HOME*\deinstall.

The `deinstall` command uses the information you provide and the information gathered from the software home to create a parameter file. Alternatively, you can supply a parameter file generated previously by the `deinstall` command using the `-checkonly` option, or by editing the response file template.

> **Caution:** When you run the `deinstall` command, if the central inventory contains no other registered homes besides the home that you are deconfiguring and removing, then the Deinstallation tool removes the following files and directory contents in the Oracle base directory of the Oracle Database installation owner:
>
> - admin
> - cfgtoollogs
> - checkpoints
> - diag
> - oradata
> - flash_recovery_area
>
> Oracle strongly recommends that you configure your installations using an Optimal Flexible Architecture (OFA) configuration, and that you reserve Oracle base and Oracle home paths for exclusive use of Oracle software. If you have any user data in these locations in the Oracle base that is owned by the user account that owns the Oracle software, then the `deinstall` command deletes this data.

The command uses the following syntax, where variable content is indicated by italics:

```
deinstall.bat -home complete path of Oracle home [-silent] [-checkonly] [-local]
[-paramfile complete path of input parameter property file] [-params name1=value
name2=value . . .]
[-o complete path of directory for saving files] [-help]
```

Oracle recommends that you run the deinstallation tool as the Oracle software installation owner. The default method for running the deinstall tool is from the `deinstall` directory in the Oracle home as the installation owner:

```
DRIVE_LETTER:\> deinstall
```

Provide information about your servers as prompted or accept the defaults.

The `deinstall` tool stops Oracle software, and removes Oracle software and configuration files on the operating system for a specific Oracle home. If you run the deinstallation tool to remove an Oracle Grid Infrastructure for a standalone server, then the deinstaller prompts you to run the `roothas.pl` script, to deconfigure Oracle Restart.

In addition, you can run the deinstall tool from other locations, or with a parameter file, or select other options to run the tool.

> **Note:** On Windows Vista, Windows Server 2008, Windows Server
> 2008 R2, Windows 7, Windows 8, Windows 8.1, Windows Server 2012,
> and Windows Server 2012 R2, if User Account Control is enabled, then
> you must create a desktop shortcut to a DOS command window. Open
> the command window through the **Run as administrator**, right-click
> context menu, and start the deinstall tool.
>
> For more information about the User Account Control, see "Managing
> User Accounts with User Account Control".

The options are:

- `-home`

  Use this flag to indicate the home path of the Oracle home to check or deinstall. To
  deinstall Oracle software using the `deinstall` command in the Oracle home you
  plan to deinstall, provide a parameter file in another location, and do not use the
  `-home` flag.

  If you run deinstall from the `ORACLE_HOME\deinstall` path, then the `-home` flag is
  not required because the tool knows from which home it is being run. If you use
  the standalone version of the tool, then `-home` is mandatory.

- `-silent`

  Use this flag to run the command in silent or response file mode. If you use the
  `-silent` flag, then you must use the `-paramfile` flag, and provide a parameter file
  that contains the configuration values for the Oracle home to deinstall or
  deconfigure.

  You can generate a parameter file to use or modify by running `deinstall` with the
  `-checkonly` flag. The `deinstall` command then discovers information from the
  Oracle home to deinstall and deconfigure. It generates the properties file, which
  you can then use with the `-silent` option.

  You can also modify the template file `deinstall.rsp.tmpl`, located in the
  `response` folder.

- `-checkonly`

  Use this flag to check the status of the Oracle software home configuration.
  Running the command with the `-checkonly` flag does not remove the Oracle
  configuration. The `-checkonly` flag generates a parameter file that you can use
  with the `deinstall` command.

- `-local`

  Use this flag on a multinode environment to deinstall Oracle software in a cluster.

  When you run `deinstall` with this flag, it deconfigures and deinstalls the Oracle
  software on the local node (the node where `deinstall` is run). On remote nodes, it
  deconfigures Oracle software, but does not deinstall the Oracle software.

- `-paramfile` *complete path of input parameter property file*

  Use this flag to run `deinstall` with a parameter file in a location other than the
  default. When you use this flag, provide the complete path where the parameter
  file is located.

  The default location of the parameter file depends on the location of `deinstall`:

- – From the installation media or stage location: `ORACLE_HOME\inventory\response`.

- – From a unzipped archive file from OTN: `ziplocation\response`.

- – After installation from the installed Oracle home: `ORACLE_HOME\deinstall\response`.

- ■ `-params [`name1=`value` name 2=`value` name3=`value` ...]`

  Use this flag with a parameter file to override one or more values to change it in a parameter file you have created.

- ■ `-o` *complete path of directory for saving files*

  Use this flag to provide a path other than the default location where the properties file is saved. The default location is `\response\deinstall.rsp.tmpl`.

  The default location of the parameter file depends on the location of `deinstall`:

  - – From the installation media or stage location before installation: `ORACLE_HOME\`

  - – From an unzipped archive file from OTN: `\ziplocation\response\`.

  - – After installation from the installed Oracle home: `ORACLE_HOME/deinstall/response`.

- ■ `-help`

  Use the help option (`-help`) to obtain additional information about the optional flags.

7.2 Downloading the Deinstall Tool for Use with Failed Installations

If you require the Deinstallation Tool (`deinstall`) to remove failed or incomplete installations, then it is available as a separate download from the Oracle Technology Network (OTN) Web site.

To download the Deinstallation Tool from OTN:

1. Go to the following URL:

    http://www.oracle.com/technetwork/database/enterprise-edition/downloads/index.html

2. Under **Oracle Database 11g Release 2**, click **See All** for the respective platform for which you want to download the Deinstallation Tool.

    The Deinstallation Tool is available for download after this page.

7.3 Example of Running the Deinstall Command

As the `deinstall.bat` command runs, you are prompted to provide the home directory of the Oracle software to remove from your system. Provide additional information as prompted.

If you run the `deinstall` tool from the `deinstall.zip` file, you must include the `-home` flag, and the help is displayed. If you run the tool from the installed `ORACLE_HOME`, then `-home` flag is not required and deinstallation starts without prompting you for a home address.

Use the optional flag `-paramfile` to provide a path to a parameter file.

In the following example, the `deinstall.bat` command is in the path
`C:\app\oracle\product\11.2.0\dbhome_1\deinstall`, and it uses a parameter file in
the software owner location `C:\Documents and Settings\oracle\`:

```
DRIVE_LETTER:\> cd \app\oracle\product\11.2.0\dbhome_1\deinstall\
DRIVE_LETTER:\> deinstall.bat -paramfile %HOMEPATH%\my_db_paramfile.tmpl
```

For the grid infrastructure home, use the `deinstall.bat` script in the Oracle grid
infrastructure for a standalone server home, which in this example is
`C:\app\oracle\product\11.2.0\grid`:

```
DRIVE_LETTER:\> cd \app\oracle\product\11.2.0\grid\deinstall\
DRIVE_LETTER:\> deinstall.bat -paramfile %HOMEPATH%\my_grid_paramfile.tmpl
```

7.4 Example of a Deinstallation Parameter File for an Oracle Database

You can run the deinstallation command on a standalone Oracle Database with the
`-paramfile` option to use the values you specify in the parameter file. The following is
an example of a parameter file, in which the Oracle Database binary owner is `oracle`,
the Oracle Database home (Oracle home) is in the path
`C:\app\oracle\product\11.2.0\dbhome_1`, the Oracle base (where other Oracle
software is installed) is `C:\app\oracle`, the Oracle Inventory home is `C:\Program
Files\Oracle\Inventory`, the virtual IP address (VIP) is `192.0.2.1`, and the local node
(the node where you run the deinstallation session from) is `myserver`:

```
#Copyright (c) 2005, 2006 Oracle Corporation. All rights reserved.
#Fri Jan 30 23:15:49 UTC 2009
ORACLE_BASE.orcl=C\:\\app\\oracle
FLASH_RECOVERY_LOC.orcl=C\:\\app\\oracle\\flash_recovery_area
STORAGE_TYPE.orcl=FS
DB_TYPE.orcl=SI_DB
ASM_HOME=
ASM_LOCAL_SID=
NETCA_LOCAL_LISTENERS=LISTENER
LOGDIR=C\:\\app\\oracle\\product\\11.2.0\\dbhome_1\\deinstall\\logs\\
NODE_LIST.orcl=node1
ARCHIVE_LOG_DESTINATION_LOC.orcl=
ORACLE_BASE=C\:\\app\\oracle
OLD_ACTIVE_ORACLE_HOME=
LOCAL_SID.orcl=orcl
INVENTORY_LOCATION=C\:\\Program Files\\Oracle\\Inventory
ASM_FILES.orcl=
RAW_MAPPING_FILE.orcl=
SID_LIST.orcl=orcl
DB_UNIQUE_NAME_LIST=orcl
DATAFILE_LOC.orcl=C\:\app\\oracle\\oradata\\orcl
CRS_HOME=false
HOME_TYPE=SIDB
CREATION_MODE.orcl=y
CONFIGFILE_LOC.orcl=C\:\\app\\oracle\\oradata\\orcl\\control01.ctl,
C\:\\app\\oracle\\oradata\\orcl\\control02.ctl,
C\:\\app\\oracle\\oradata\\orcl\\control03.ctl,C\:\\app\\oracle\\product\\11.2.0\\
dbhome_1\\database\\dr1orcl.dat,C\:\\app\\oracle\\product\\11.2.0\\dbhome_
1\\database\\dr2orcl.dat
ORACLE_BINARY_OK=true
local=false
LOCAL_NODE=myserver
SPFILE_LOC.orcl=C\:\\app\\oracle\\product\\11.2.0\\dbhome_
1\\database\\spfileorcl.ora
```

```
                    silent=false
                    ORACLE_HOME=C\:\\app\\oracle\\product\\11.2.0\\dbhome_1
                    DISK_GROUPS.orcl=
```

7.5 Example of a Deinstallation Parameter File for Oracle Grid Infrastructure

You can run the deinstall command on an Oracle grid infrastructure for a standalone server home with the -paramfile option to use the values you specify in the parameter file.

The following is an example of a parameter file, in which the Oracle grid infrastructure binary owner is oracle, the Oracle grid infrastructure home is in the path D\:\\app\\oracle, the Oracle base (where other Oracle software is installed) is D\:\\app\\11.2.0\\, the central Oracle Inventory home (oraInventory) is C\:\\Program Files\\Oracle\\Inventory, the virtual IP address (VIP) is 192.0.2.1, the local node (the node where you are run the deinstallation session from) is myserver:

```
#Copyright (c) 2005, 2006 Oracle Corporation.  All rights reserved.
#Wed Feb 18 06:15:35 PST 2009
LOCAL_NODE=myserver
HOME_TYPE=SIHA
ASM_REDUNDANCY=NORMAL
ORACLE_BASE=D\:\\app\\oracle
SCAN_PORT=0
silent=false
ASM_UPGRADE=false
ORA_CRS_HOME=D\:\\app\\oracle\\product\\11.2.0\\grid
GPNPCONFIGDIR=$ORACLE_HOME
LOGDIR=D\:\\app\\oracle\\product\\11.2.0\\db_1\\deinstall\\logs\\
GPNPGCONFIGDIR=$ORACLE_HOME
ORACLE_OWNER=Administrator
CRS_STORAGE_OPTION=0
ORACLE_BINARY_OK=true
NETCA_LISTENERS_REGISTERED_WITH_HAS=LISTENER
ASM_ORACLE_BASE=D\:\\app\\oracle
NETCFGJAR_NAME=netcfg.jar
JREDIR=D\:\\app\\oracle\\product\\11.2.0\\grid\\jdk\\jre\\
ASM_DISK_GROUPS=DATA
LANGUAGE_ID='AMERICAN_AMERICA.WE8MSWIN1252'
CSS_LEASEDURATION=400
ASM_HOME=D\:\\app\\oracle\\product\\11.2.0\\grid
ASM_DIAGNOSTIC_DEST=D\:\\app\\oracle
SHAREJAR_NAME=share.jar
HELPJAR_NAME=help4.jar
SILENT=false
local=false
INVENTORY_LOCATION=C\:\\Program Files\\Oracle\\Inventory
GNS_CONF=false
JEWTJAR_NAME=jewt4.jar
EMBASEJAR_NAME=oemlt.jar
ASM_DISKS=\\\\.\\ORCLDISKDATA0,\\\\.\\ORCLDISKDATA1,\\\\.\\ORCLDISKDATA2
ORACLE_HOME=D\:\\app\\oracle\\product\\11.2.0\\grid
CRS_HOME=true
ASM_IN_HOME=y
EWTJAR_NAME=ewt3.jar
ASM_DROP_DISKGROUPS=true
OLD_ACTIVE_ORACLE_HOME=
```

```
ASM_LOCAL_SID=+ASM
JLIBDIR=D\:\\app\\oracle\\product\\11.2.0\\grid\\jlib
VNDR_CLUSTER=false
ASM_DISK_GROUP=DATA
```

A

Installing Java Access Bridge

Java Access Bridge enables the use of a screen reader with Oracle components. Java Access Bridge enables assistive technologies to read Java-based interfaces, such as Oracle Universal Installer and Oracle Enterprise Manager Database Control, on Windows platform.

Java Access Bridge 2.0.2 is the latest version of Java Access Bridge that includes updated APIs to support 64-bit systems and includes packages to support 32-bit Windows systems. Uninstall all previous versions of Java Access Bridge before installing the latest version.

Java Access Bridge is supported on Windows Server 2008 x64, Windows Server 2008 R2 x64, Windows 7 x64, Windows 8 x64, Windows 8.1 x64, Windows Server 2012 x64, and Windows Server 2012 R2 for 64-bit database installations. For a list of supported system configurations, including supported versions of Microsoft Windows and Java SE, see section "Supported System Configurations" available at the following link location:

http://www.oracle.com/technetwork/java/javase/tech/index-jsp-136191.html

Starting with Oracle Database 11*g* Release 2 (11.2.0.4), Oracle Universal Installer uses Java Runtime Environment (JRE) 1.6 contained on the Oracle Database installation media. JRE enables the use of Java Access Bridge during installation. By default, Java Access Bridge is disabled. To enable Java Access Bridge, run the following command (where JRE_HOME is the directory of your JRE):

```
JRE_HOME\bin\jabswitch -enable
```

For earlier releases, set up Java Access Bridge with JRE 1.5. To do so, stop your assistive technology, then from the installation media root, go to the install directory and double-click the access_setup.bat file before the installation. After running the batch file, restart your assistive technology program.

See "Setting Up Java Access Bridge" for information about installing and configuring Java Access Bridge after you install Oracle components.

Note: Starting with Oracle Database 11*g* Release 2 (11.2.0.4), Java Access Bridge is supported on Windows x64.

A.1 Setting Up Java Access Bridge

This section describes how to install and configure Java Access Bridge for Windows after installing Oracle components.

To set up Java Access Bridge 2.0.2 on a Windows 32-bit and 64-bit operating system:

1. Go to Java Standard Edition (Java SE) Downloads page to download the latest build of JDK 7:

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

2. Install JDK 7.

   > **Note:** You must have administrator privileges to install JDK on Windows.

3. Press the Windows key+U on Windows Vista and later to open the Ease of Access Center, and select **Use the computer without a display**.

   Press the Windows key+U on Windows XP to open the Utility Manager.

   > **See Also:** Refer to Micrsoft documentation for accessibility options in Windows operating system.

4. Select the **Enable Accessbridge** check box. Click **Save**.

5. Download Java Access Bridge 2.0.2:

   http://www.oracle.com/technetwork/java/javase/downloads/jab-2-0-2-download-354311.html

   Download the `accessbridge-2_0_2-fcs-bin-b06.zip` file, after accepting the Oracle license agreement.

   > **Note:** Java Access Bridge 2.0.1 is supported on Oracle Database 11*g* Release 2 (11.2.0.1 to 11.2.0.3).
   >
   > Download Java Access Bridge 2.0.1:
   >
   > http://www.oracle.com/technetwork/java/javasebusiness/downloads/java-archive-downloads-java-client-419417.html#accessbridge-2.0.1-oth-JPR
   >
   > Select the `accessbridge-2_0_1-manual_install.zip` file and extract its files on your system where you plan to install Java Access Bridge.

6. Extract `accessbridge-2.0.2` to a directory on your system where you plan to install Java Access Bridge. For example, name the directory as follows:

   `AB_HOME`

7. Open the command prompt and navigate to the directory depending on the type of installation (database, client, or companion) you performed by typing the `DRIVE_LETTER`:

   To access the files in `Disk1` directory, type the following:

   `DRIVE_LETTER:\>cd Disk1`

8. Run the following command once you are in the `Disk1` directory:

   `setup.exe -jreLoc path-to-jdk7\jre`

   Oracle Universal Installer starts and JAWS is able to read all prompts and controls on the screen.

9. Once you click the **Install** button, you must open Windows Explorer to see the directory where the database is installed (*DRIVE_LETTER:*\app*user name*\product\11.2.0\dbhome_1), until the JDK folder is created. Once the JDK folder is created, depending upon the Windows operating system, copy the files listed in Table A–1 or Table A–2 from the Java Access Bridge source location to the JDK destination folder. Copying these files will enable accessibility for both Oracle Database Configuration Assistant and Oracle Net Configuration Assistant.

Table A–1   Copy Files to JDK Directory on Windows 32-Bit

Copy	To
AB_HOME\JavaAccessBridge.dll	dbhome_1\jdk\jre\bin
AB_HOME\JAWTAccessBridge.dll	dbhome_1\jdk\jre\bin
AB_HOME\WindowsAccessBridge.dll	C:\Windows\System32
AB_HOME\accessibility.properties	dbhome_1\jdk\jre\lib
AB_HOME\access-bridge.jar	dbhome_1\jdk\jre\lib\ext
AB_HOME\jaccess.jar	dbhome_1\jdk\jre\lib\ext

Table A–2   Copy Files to JDK Directory on Windows 64-Bit

Copy	To
AB_HOME\JavaAccessBridge-64.dll	dbhome_1\jdk\jre\bin
AB_HOME\JAWTAccessBridge-64.dll	dbhome_1\jdk\jre\bin
AB_HOME\WindowsAccessBridge-64.dll	C:\Windows\System32
AB_HOME\accessibility.properties	dbhome_1\jdk\jre\lib
AB_HOME\access-bridge-64.jar	dbhome_1\jdk\jre\lib\ext
AB_HOME\jaccess.jar	dbhome_1\jdk\jre\lib\ext

A.2 Configuring Oracle Components to Use Java Access Bridge

To configure Oracle components to use Java Access Bridge after completing the installation, set the system variable ORACLE_OEM_CLASSPATH to point to the installed Java Access Bridge files:

1. From the **Start** menu, select **Settings**, **Control Panel**, and then **System** to display the Windows System control panel.

2. Select the **Advanced** tab.

3. Click the **Environment Variables** button.

4. Click the **New** button under the System Variable list. The New System Variable dialog box appears.

5. In the **Variable Name** field, enter ORACLE_OEM_CLASSPATH.

6. In the **Variable Value** field, enter the full path to the jaccess.jar and access-bridge.jar.

   Use a semicolon to separate the two paths. Do not use quotes or character spaces. For example, if JRE 1.5 is installed in the default location, the setting is:

   dbhome_1\jdk\jre\lib\ext\jaccess.jar;*dbhome_1*\jdk\jre\lib\ext\access-bridge.jar

7. Click **OK**.

B

Optimal Flexible Architecture

This appendix describes the Optimal Flexible Architecture standard. This standard is a set of configuration guidelines created to ensure well organized Oracle installations that are easier to maintain. It includes information about the following topics:

- Overview of the Optimal Flexible Architecture Standard
- Changes to the Optimal Flexible Architecture for Oracle Database
- Directory Tree Differences by Release
- Optimal Flexible Architecture Directory Naming Conventions
- Optimal Flexible Architecture and Multiple Oracle Home Configurations
- Comparison Between Optimal Flexible Architecture on Windows and UNIX
- Optimal Flexible Architecture Structure File Mapping

B.1 Overview of the Optimal Flexible Architecture Standard

The Optimal Flexible Architecture standard helps you to organize database software and configure databases to allow multiple databases, of different versions, owned by different users to coexist. Optimal Flexible Architecture assists in identification of `ORACLE_BASE` with its Automatic Diagnostic Repository (ADR) diagnostic data to properly collect incidents.

All Oracle components on the installation media are compliant with Optimal Flexible Architecture. Oracle Universal Installer places Oracle Database components in directory locations, assigning the default permissions that follow Optimal Flexible Architecture guidelines.

Oracle recommends that you use Optimal Flexible Architecture, specially if the database grows in size, or if you plan to have multiple databases.

B.1.1 Advantages of Multiple Oracle Homes and OFA

When you install Oracle database, you are installing one of the largest applications that your computer can support. Using multiple Oracle homes and Optimal Flexible Architecture provides many advantages when administering large databases. The following advantages are important:

- Structured organization of directories and files, and consistent naming for database files simplify database administration.
- Distribution of I/O across multiple disks prevents performance bottlenecks caused by multiple read or write commands issued simultaneously to a single drive.

- Distribution of applications across multiple disks safeguards against database failures.

- Login home directories are not at risk when database administrators add, move, or delete Oracle home directories.

- Multiple databases, of different versions, owned by different users can coexist concurrently.

- Software upgrades can be tested in an Oracle home in a separate directory from the Oracle home where your production database is located.

B.2 Changes to the Optimal Flexible Architecture for Oracle Database

For previous releases of Oracle Database, the Optimal Flexible Architecture recommended Oracle home path was similar to the following:

```
c:\oracle\ora92
```

Starting with Oracle Database 11*g* Release 1 (11.1), the Optimal Flexible Architecture recommended Oracle home path changed. The Optimal Flexible Architecture recommended Oracle home path is now similar to the following:

```
c:\app\username\product\11.2.0\dbhome_1
```

The *ORACLE_BASE* default does not contain version information but the default *ORACLE_HOME* does.

B.3 Directory Tree Differences by Release

Optimal Flexible Architecture has necessitated changes to the Oracle Database directory tree. This section lists the differences:

- Top-Level Oracle Directory
- Database File Names
- Database File Name Extensions

B.3.1 Top-Level Oracle Directory

When you install Oracle Database Optimal Flexible Architecture-compliant database, all subdirectories are under a top-level Oracle base directory, *DRIVE_LETTER*:\app*username*, where *DRIVE_LETTER* is any hard drive.

The Oracle base directory contains *ORACLE_HOME* directories, \oradata directories (for database files), \diag (for diagnostic data), \flash_recovery_area (for recovery operations), and \admin directories (for database administration files).

B.3.2 Database File Names

Database files do not have the SID in the database file name. For example, the first control file is named control01.ctl. The SID in the file name is not necessary because all the database files for a particular database are placed in \oradata under a directory called *DB_UNIQUE_NAME* that is named for that database.

B.3.3 Database File Name Extensions

In an Optimal Flexible Architecture-compliant release, database file names have the following extensions:

- `.ctl` for control files
- `.log` for log files
- `.dbf` for data files

B.4 Optimal Flexible Architecture Directory Naming Conventions

Optimal Flexible Architecture uses directory naming conventions that make it easy to identify the precise Oracle home and database name that is associated with a set of files. This section describes the naming conventions used for top-level directories of an Optimal Flexible Architecture-compliant database directory tree:

- ORACLE_BASE Directory
- ORACLE_HOME Directory
- Automatic Diagnostic Repository (ADR) Directory
- ADMIN Directory
- ORADATA Directory
- RECOVERY_AREA Directory

B.4.1 ORACLE_BASE Directory

ORACLE_BASE is the root of the Oracle directory tree. If you install an Optimal Flexible Architecture-compliant database using Oracle Universal Installer default settings, then *ORACLE_BASE* is *DRIVE_LETTER*:\app*username.*

If you are installing Oracle Database for Microsoft Windows on a computer with no other Oracle software installed, then you can change the *ORACLE_BASE* directory before running Oracle Universal Installer. Most users do not need or want to do this.

Do not change the value of *ORACLE_BASE* after you run Oracle Universal Installer for the first time. If there is an existing *ORACLE_BASE* and you change it, then there is a conflict of Oracle base directories. If you create another *ORACLE_BASE* when the original *ORACLE_BASE* exists, then certain tools and the database are not able to find previously created files. They look for them in the new *ORACLE_BASE* instead of the original *ORACLE_BASE*.

> **See Also:** Your operating system documentation for instructions about editing environment variables

B.4.2 ORACLE_HOME Directory

The *ORACLE_HOME* directory is located under *DRIVE_LETTER:\ORACLE_BASE*, where `DRIVE_LETTER:\`is any hard drive, and contains subdirectories for Oracle software executables and network files.

If you install Oracle Database for Windows on a computer with no other Oracle software installed and you use default settings, then the first directory that you create is called `\dbhome_1`.

B.4.3 Automatic Diagnostic Repository (ADR) Directory

Oracle Database 11*g* onwards, Automatic Diagnostic Repository (ADR) directories replace the `bdump`, `cdump`, and `udump` directories for the database. The ADR diagnostic data goes into the *ORACLE_BASE*\diag\rdbms*DB_UNIQUE_NAME**instance_name* by default.

Some of these subdirectories are:

```
\alert
\hm
\incident
\incpkg
\ir
\lck
\metadata
\stage
\sweep
\trace
```

The ADR home has the trace, alert, and incident sub-directories. Table B–1 describes the ADR directories.

Table B–1   Locations for Diagnostic Traces

Diagnostic Data	10*g* Location	11*g* Location
Foreground Process traces	user_dump_dest	ADR_HOME/trace/
Background Process traces	background_dump_dest	ADR_HOME/trace/
Alert Log Data	background_dump_dest	ADR_HOME/alert/
Core Dump	core_dump_dest	ADR_HOME/incident/In/
Incident Dumps	user_dump_dest or background_dump_dest depending on the process	ADR_HOME/incident/In/

B.4.4 ADMIN Directory

Database administration files are stored in subdirectories of *ORACLE_BASE*\admin*DB_UNIQUE_NAME*.

B.4.5 ORADATA Directory

Database files are stored in *ORACLE_BASE*\oradata*DB_UNIQUE_NAME*. Names and brief descriptions of these files are:

```
CONTROL01.CTL     --control file 1
CONTROL02.CTL     --control file 2
CONTROL03.CTL     --control file 3
EXAMPLE01.DBF     --EXAMPLE tablespace data files
SYSAUX01.DBF      --SYSAUX tablespace data files
SYSTEM01.DBF      --SYSTEM tablespace data file
TEMP01.DBF        --TEMP tablespace data file
USERS01.DBF       --USERS tablespace data file
*.dbf             --data files corresponding to each tablespace in your database
REDO01.LOG        --redo log file group one, member one
REDO02.LOG        --redo log file group two, member one
REDO03.LOG        --redo log file group three, member one
```

> **Note:**   This directory structure allows for disk striping on UNIX and Windows platforms. See "Support for Symbolic Links on Windows" on page B-7.

B.4.6 RECOVERY_AREA Directory

The `recovery_area` directory stores and manages files related to backup and recovery. It contains a subdirectory for each database on the system. A fast recovery area is an optional disk location that you can use to store recovery-related files such as control files and online redo log copies, archived logs, flashback logs, and Oracle Database Recovery Manager (RMAN) backups. Oracle and RMAN manage the files in the fast recovery area automatically.

> **See Also:** *Oracle Database Backup and Recovery User's Guide* to learn how to create and use a fast recovery area

B.5 Optimal Flexible Architecture and Multiple Oracle Home Configurations

The following sections describe various Optimal Flexible Architecture and multiple Oracle homes configurations.

B.5.1 Specifying an ORACLE_HOME Directory

To install an Optimal Flexible Architecture-compliant database, you must specify an Oracle home directory in the form of:

```
DRIVE_LETTER:\app\username\product\11.2.0\dbhome_1
```

where:

- `DRIVE_LETTER:\` is any hard drive. For example, `c:\`

- `\app\username` is the `ORACLE_BASE` before performing the installation.

- `dbhome_1` is the default directory name.

The following are examples of Optimal Flexible Architecture-compliant Oracle home directories:

- `c:\app\test1\product\11.2.0\dbhome_1`

- `d:\app\test2\product\11.2.0\dbhome_1`

B.5.2 Installing a Default Optimal Flexible Architecture Database: Example 1

This example shows how to create all Oracle homes within one Oracle base directory.

1. Install any Oracle Database that supports Optimal Flexible Architecture (Oracle Database Release 8.1.6 or later) on a computer with no other Oracle software installed and ensure that you accept the default settings for the Oracle home (for example, `c:\app\username\product\11.2.0\dbhome_1`).

2. Install any Oracle Database in a second Oracle home accepting the default settings.

Table B–2 shows the default Optimal Flexible Architecture database settings.

Table B–2   Default Optimal Flexible Architecture Database Settings

Setting	Value
`ORACLE_BASE`	`c:\app\username` (same for all Oracle homes)
Oracle home 1	`c:\app\username\product\11.1.0\dbhome_1`
Oracle home 2	`c:\app\username\product\11.1.0\dbhome_2`

B.5.3 Installing a Nondefault Optimal Flexible Architecture Database: Example 2

In this example, you install each Oracle home into its own directory, but they all share the same Oracle base.

1. Install any Oracle Database that supports Optimal Flexible Architecture (Oracle Database 8.1.6 or later) on a computer with no other Oracle software installed and change the default Oracle Universal Installer settings for the first Oracle home (for example, from `c:\oracle\ora81` to `X:\xyz\oracle\abc`).

2. Install any Oracle Database and change the default Oracle Universal Installer settings for the second Oracle home (for example, from `c:\oracle\ora10` to `X:\pqr`).

Table B–3 shows the nondefault Optimal Flexible Architecture database settings for this example.

Table B–3   Nondefault Optimal Flexible Architecture Database Settings: Example 2

Setting	Value
ORACLE_BASE	`X:\xyz\oracle`
	(same for both Oracle homes)
Oracle home 1	`X:\xyz\oracle\abc`
Oracle home 2	`X:\pqr`

The resulting directory tree would look similar to this:

```
X:\pqr                           --Oracle home 2
  \bin
  \network
X:\xyz
    \oracle                      --ORACLE_BASE for both Oracle homes
      \abc                       --Oracle home 1
        \bin
        \network
      \admin
       \DB_UNIQUE_NAME1
         \dpdump
         \
       \DB_UNIQUE_NAME2
         \...
      \oradata
       \DB_UNIQUE_NAME1
         CONTROL01.CTL
         CONTROL02.CTL
         CONTROL03.CTL
         EXAMPLE01.DBF
         SYSAUX01.DBF
         SYSTEM01.DBF
         TEMP01.DBF
         USERS01.DBF
         REDO01.LOG
         REDO02.LOG
         REDO03.LOG
       \DB_UNIQUE_NAME2
```

B.6 Comparison Between Optimal Flexible Architecture on Windows and UNIX

You implement Optimal Flexible Architecture on Windows and UNIX in the same way. However, differences exist regarding the following:

- Directory Naming
- ORACLE_BASE Directory
- Support for Symbolic Links on Windows

> **See Also:**   Your UNIX operating system-specific administrator's reference for information about Optimal Flexible Architecture on UNIX

B.6.1 Directory Naming

Top-level names of the Optimal Flexible Architecture directory tree differ between Windows and UNIX. However, main subdirectory names and file names are the same on both operating systems.

B.6.2 ORACLE_BASE Directory

On Windows, Oracle base is associated with an Oracle home directory. `ORACLE_BASE` is defined in the registry (for example, in `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\KEY_ HOME_NAME`).

On UNIX, `ORACLE_BASE` is associated with a UNIX user's environment.

B.6.3 Support for Symbolic Links on Windows

The goal of Optimal Flexible Architecture is to place all Oracle software under one `ORACLE_BASE` directory and to spread files across different physical drives as your databases increase in size.

On UNIX, although everything seems to be in one directory on the same hard drive, files can be on different hard drives if they are symbolically linked or have that directory as a mount point.

On Windows, you can use volume mount points to mount files on different hard drives to a single directory. You may have `oradata` directories on multiple drives, with data files in each one, on Windows version which does not support volume mount points.

Oracle recommends that you use one logical drive to store your database administration files and that you place other files, as needed, on other logical drives in an `oradata\DB_UNIQUE_NAME` directory.

In the following example, there are four logical drives for a database named `prod`:

- `c:\` contains an Oracle home and database administration files.
- `f:\` contains redo log files. `The F:\` drive could also represent two physical drives that have been striped to increase performance.
- `g:\` contains one of the control files and all **tablespace** files. The `G:\` drive could also use a RAID Level-5 configuration to increase reliability.
- `h:\` contains the second control file.

The directory structure would look similar to this:

```
c:\app\username\product\11.2.0   --First logical drive
    \dbhome_1                --Oracle home
      \bin                --Subtree for Oracle binaries
      \network            --Subtree for Oracle Net
      \...
    \admin                --Subtree for database administration files
      \prod               --Subtree for prod database administration files
        \adump            --Audit files
        \dpdump           --Default directory for data pump operations.
        \pfile            --Initialization parameter file

f:\app\username\product\11.2.0   --Second logical drive (two physical drives,
striped)
    \oradata              --Subtree for Oracle Database files
      \prod               --Subtree for prod database files
        redo01.log        --Redo log file group one, member one
        redo02.log        --Redo log file group two, member one
        redo03.log        --Redo log file group three, member one

g:\app\username\product\11.1.0   --Third logical drive (RAID level 5
configuration)
    \oradata              --Subtree for Oracle Database files
      \prod               --Subtree for prod database files
        CONTROL01.CTL     --Control file 1
        EXAMPLE01.DBF     --EXAMPLE tablespace data files
        SYSAUX01.DBF      --SYSAUX tablespace data files
        SYSTEM01.DBF      --System tablespace data file
        TEMP01.DBF        --Temporary tablespace data file
        USERS01.DBF       --Users tablespace data file

h:\app\username\product\11.2.0   --Fourth logical drive
    \oradata              --Subtree for Oracle Database files
      \prod               --Subtree for prod database files
        CONTROL02.CTL     --Control file 2
```

B.7 Optimal Flexible Architecture Structure File Mapping

Table B–4 shows a hierarchical file mapping for log files of a sample Optimal Flexible Architecture-compliant installation in the orcl database.

Table B–4   Hierarchical File Mapping for Log Files in an Optimal Flexible Architecture Installation

Directory	Description
C:\app*username*\admin\orcl\TAR	Subtree for support log files
C:\app*username*\admin\orcl\arch	Archived log files
C:\app*username*\admin\orcl\create\	Contains the database creation log files
C:\app*username*\oradata\orcl*.log	Redo log files
C:\app*username*\admin\orcl\dpdump\	Contains the data pump file dp.log

Table B–4   (Cont.) Hierarchical File Mapping for Log Files in an Optimal Flexible Architecture Installation

Directory	Description
`C:\app\`*`username`*`\diag`	Contains all database, listener, sqlnet and other diagnostic logs
`C:\app\`*`username`*`\audit`	Contains all audit logs
`C:\app\`*`username`*`\cfgtoollogs`	Contains logs for configuration assistants such as Oracle Database Configuration Assistant, Database Upgrade Assistant, and Oracle Net Configuration Assistant

C

Installing and Configuring Oracle Database Using Response Files

This appendix describes how to use response files to perform silent or response file installations, configure network connections, and configure or start an Oracle database. It covers the following topics:

- How Response Files Work
- Preparing a Response File
- Running Oracle Universal Installer Using the Response File
- Running Net Configuration Assistant Using a Response File
- Running Oracle Database Configuration Assistant Using a Response File
- Postinstallation Configuration Using a Response File

C.1 How Response Files Work

You can automate the installation and configuration of Oracle software, either fully or partially, by specifying a response file when you start Oracle Universal Installer. Oracle Universal Installer uses the values in the response file to provide answers to some or all of the Oracle Universal Installer prompts. It includes information about the following topics:

- Reasons for Using Silent Mode or Response File Mode
- General Procedure for Using Response Files

Typically, Oracle Universal Installer runs in interactive mode, which means that it prompts you to provide information in graphical user interface (GUI) screens. When you use response files to provide this information, you run Oracle Universal Installer at a command prompt using either of the following modes:

- **Silent mode**: Oracle Universal Installer does not display any screens. Instead it displays progress information in the command window where you started it. To use silent mode, you run `setup.exe` with the `-silent` parameter and include a response file, which contains responses to the Oracle Universal Installer prompts.

- **Response File mode**: During a response file mode installation, Oracle Universal Installer displays all the screens, screens for which you specify information in the response file and also screens for which you did not specify the required information in the response file. The advantage is that you can validate the values in the screens for which you have provided the information in the response file and continue with the installation. To use response file mode, run `setup.exe`

without the `-silent` parameter, but include the response file or any other parameters that apply.

You define the settings for a silent or response file installation by entering values for the variables listed in the response file. For instance, to specify the Oracle home, you would supply the appropriate value for the *ORACLE_HOME* variable, as in the following example:

```
ORACLE_HOME="C:\app\product"
```

Another way of specifying the response file variable settings is to pass them as command-line arguments when you run Oracle Universal Installer. For example:

```
DRIVE_LETTER:\setup.exe_location> setup -silent "ORACLE_HOME=C:\app\product" ...
```

> **See Also:**
>
> - *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about response file formats
>
> - My Oracle Support website for more information about response files:
>
>   https://support.oracle.com/

C.1.1 Reasons for Using Silent Mode or Response File Mode

Table C–1 describes several reasons why you might want to run Oracle Universal Installer in silent mode or response file mode.

Table C–1   Reasons for Using Silent Mode or Response File Mode

Mode	Uses
Silent	Use silent mode to: - Complete an unattended installation - Complete several similar installations on multiple systems without user interaction Oracle Universal Installer displays progress information in the window that you used to start it, but it does not display the Oracle Universal Installer screens.
Response File	Use response file mode to complete similar Oracle software installations on multiple systems, providing default answers to some, but not all, of Oracle Universal Installer prompts. In response file mode, all the installer screens are displayed, but defaults for the fields in these screens are provided by the response file. You have to provide information for the fields in screens where you have not provided values in the response file.

C.1.2 General Procedure for Using Response Files

You follow these general steps to install Oracle Database using response files:

1. If you plan to use Oracle Automatic Storage Management and configure new disks, then you must perform the following steps:

    a. Create partitions for DAS or SAN disks.

    b. Manually configure the disks using the `asmtoolg` or `asmtool` utility.

See Also:

-

-

2. Customize or create a response file for the installation settings that you need.

   You can create the response file by using one of the following methods:

   - Modify one of the sample response files that is provided with the installation.

   - Run Oracle Universal Installer at a command prompt and save the inputs by selecting the **Save Response File** option.

   explains how to customize or create the response file.

3. Run Oracle Universal Installer from a command prompt, specifying the response file, using either silent or response file mode.

   > **Note:** Windows Vista, Windows Server 2008, and later versions require Administrator privileges at the command prompt.

   explains how to run Oracle Universal Installer with a response file.

C.2 Preparing a Response File

This section describes the methods that you can use to prepare a response file for use during silent-mode or response file-mode installations:

- Editing a Response File Template
- Saving a Response File

C.2.1 Editing a Response File Template

This method is most useful for the Enterprise Edition or Standard Edition installation types.

Oracle provides response file templates for each product and installation type, and for each configuration tool. These files are located in the `database\response` directory on the Oracle Database installation media.

> **Note:** If you copied the software to a hard disk, the response files are located in the `stage_area\database\response` directory.

Table C–2 lists the available sample response files:

Table C–2   Response Files

Response File Name	This File Silently Runs The...
db_install.rsp	Oracle Database

Table C–2   (Cont.) Response Files

Response File Name	This File Silently Runs The...
grid_install.rsp	Oracle Grid Infrastructure
dbca.rsp	Oracle Database Configuration Assistant
netca.rsp	Oracle Net Configuration Assistant

> **Caution:**   When you modify a response file template and save a file for use, the response file may contain plain text passwords. Ownership of the response file should be given to the Oracle software installation owner only. Oracle strongly recommends that database administrators or other administrators delete or secure response files when they are not in use.

To copy and modify a response file:

1. Copy the appropriate response files from the database\response directory on the Oracle Database media to your hard drive.

2. Modify the response files with a text file editor.

> **See Also:**   *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for detailed information about creating response files. In an installed Oracle Database, select **Start**, then **All Programs**, then **Oracle - *HOME_NAME***, then **Oracle Installation Products**, then **Universal Installer Concepts Guide**. It appears in HTML format.

3. Run the response file by following the instructions in the "Running Oracle Universal Installer Using the Response File" section on page C-5.

C.2.2 Saving a Response File

You can use the Oracle Universal Installer in interactive mode to save a response file, which you can edit and then use to complete silent mode or response file mode installations.

Starting with Oracle Database 11*g* Release 2 (11.2), you can save all the installation steps into a response file during installation by clicking **Save Response File** on the Summary page. You can use the generated response file for a silent installation later.

When you save the response file, you can either complete the installation, or you can exit from Oracle Universal Installer on the Summary page, before it starts to copy the software to the system.

> **Note:**   Oracle Universal Installer does not save passwords in the response file.

To save a response file:

1. Ensure that the computer on which you are creating the response file has met the requirements described in Chapter 2.

    When you run Oracle Universal Installer to save a response file, it checks the system to verify that it meets the requirements to install the software. For this

reason, Oracle recommends that you complete all of the required preinstallation tasks and save the response file while completing an installation.

2. At the command prompt, use the `cd` command to change to the directory that contains the Oracle Universal Installer `setup.exe` executable.

> **Note:** Windows Vista, Windows Server 2008, and later versions require Administrator privileges at the command prompt.

On the installation DVD, `setup.exe` is located in the `database` directory. Alternatively, navigate to the directory where you downloaded or copied the installation files.

3. Run `setup.exe`.

4. After Oracle Universal Installer starts, enter the installation settings, to save the response file.

5. When the installer displays the Summary screen, perform the following:

   a. Click **Save Response File** and specify a file name and location for the response file. Then, click **Save** to save the values to the file.

   b. Click **Finish** to continue with the installation.

   Click **Cancel** if you do not want to continue with the installation. The installation stops, but the saved response file is retained.

6. Before you use the saved response file on another system, edit the file and make any required changes.

   Use the instructions in the file as a guide when editing it.

C.3 Running Oracle Universal Installer Using the Response File

At this stage, you are ready to run Oracle Universal Installer at the command line, specifying the response file you created, to perform the installation. On Windows Vista, Windows Server 2008, and later versions, you must open the command prompt with Administrator privileges. The Oracle Universal Installer executable, `setup.exe`, provides several options. For help information about the full set of these options, run `setup.exe` with the `-help` option, for example:

```
DRIVE_LETTER:\setup.exe_location setup -help
```

A new command window appears, with the "Preparing to launch..." message. In a moment, the help information appears in that window.

To run Oracle Universal Installer and specify a response file:

1. Place the response file on the computer where you want to install Oracle Database.

2. At a command prompt, run Oracle Universal Installer with the appropriate response file. On Windows Vista, Windows Server 2008, and later versions, you must open the command prompt with Administrator privileges.For example:

```
DRIVE_LETTER:\setup.exe_location setup [-silent] "variable=setting"
[-nowelcome] [-noconfig] [-nowait] -responseFile
 filename
```

where:

- `filename`: Identifies the full path of the response file.

- *setup.exe_location*: Indicates the location of setup.exe.

- -silent: Runs Oracle Universal Installer in silent mode and suppresses the Welcome window.

- "*variable=setting*" refers to a variable within the response file that you may prefer to run at the command line rather than set in the response file. Enclose the variable and its setting in quotes.

- -noconfig: Suppresses running the configuration assistants during installation, performing a software-only installation instead.

- -nowait: Closes the console window when the silent installation completes.

If you save a response file during a silent installation, then Oracle Universal Installer saves the variable values that were specified in the original source response file into the new response file.

See Also:

- "Installing Oracle Products" in *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about installing using response files

- "Deinstalling Products" in *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about deinstalling using response files

C.4 Running Net Configuration Assistant Using a Response File

When you run Net Configuration Assistant with a response file, you run it in silent mode. This lets you configure and start an Oracle Net listener on the system, configure naming methods, and configure Oracle Net service names. To run NetCA in silent mode, use the netca.rsp response file.

On Windows Vista, Windows Server 2008, and later versions, you must open the command prompt with Administrator privileges.

To create a Net Configuration Assistant response file:

1. Copy the netca.rsp response file template from the response file directory to a directory on your system.

   The netca.rsp is located in the database\response directory on the Oracle Database installation media.

2. Open the response file in a text editor.

3. Edit the file, following the instructions in the file.

   Net Configuration Assistant fails if you do not correctly configure the netca.rsp response file.

To run Net Configuration Assistant using the response file you just created, run Net Configuration Assistant in silent mode as follows, replacing *local_dir* with the directory where you placed your version of the netca.rsp response file:

```
C:\ORACLE_HOME\bin> netca /silent /responsefile local_dir\netca.rsp
```

For example:

```
C:\ORACLE_HOME\bin> netca /silent /responsefile
C:\oracle_response_files\mynetca.rsp
```

C.5 Running Oracle Database Configuration Assistant Using a Response File

You can run Oracle Database Configuration Assistant in silent or response file mode to configure and start an Oracle database on your system. To run Oracle Database Configuration Assistant in silent or response file mode, use the `dbca.rsp` response file.

> **Note:** If you copied the software to a hard disk, the response files are located in the `stage_area\database\response` directory.

To run Database Configuration Assistant in response file mode, you must use the `-responseFile` flag in combination with either the `-silent` or `-progressOnly` flag.

To run Database Configuration Assistant in response file mode, you must use a graphical display and set the `DISPLAY` environment variable.

> **Note:**
>
> - "Creating a Database with Noninteractive/Silent DBCA" in *Oracle Database Administrator's Guide*
>
> - "Oracle ASM Configuration Assistant Command-Line Interface" section in *Oracle Automatic Storage Management Administrator's Guide* for information about running Oracle ASMCA in noninteractive mode

On Windows Vista, Windows Server 2008, and later versions, you must open the command prompt with Administrator privileges.

This section contains the following topics:

- Silent Mode of Database Configuration Assistant

- Progress Only Mode of Database Configuration Assistant

- Running Database Configuration Assistant in Response File Mode

C.5.1 Silent Mode of Database Configuration Assistant

Use the `-silent` flag in combination with the `-responseFile` flag to set the mode to silent. In the silent mode, Database Configuration Assistant uses values that you specify, in the response file or as command-line options, to create a database. No window or user interface is displayed in the silent mode.

C.5.2 Progress Only Mode of Database Configuration Assistant

Use the `-progressOnly` flag in combination with the `-responseFile` flag, to set the mode to progress only. As it configures and starts the database, Database Configuration Assistant displays a window that contains status messages and a progress bar. This window is similar to the window that is displayed when you choose to create a preconfigured database during an Enterprise Edition or Standard Edition installation.

In this mode, Database Configuration Assistant uses values that you specify, in the response file or as command line options, to create a database.

C.5.3 Running Database Configuration Assistant in Response File Mode

To create an Oracle Database Configuration Assistant response file:

1. Copy the `dbca.rsp` response file template from the response file directory to a directory on your system.

   The `dbca.rsp` response file is located in the `database\response` directory on the Oracle Database installation media.

2. Open the `dbca.rsp` response file in a text editor.

3. Edit the `dbca.rsp` file, following the instructions in the file.

   Oracle Database Configuration Assistant fails if you do not correctly configure the `dbca.rsp` response file.

To run Oracle Database Configuration Assistant using the response file you just created, run Oracle Database Configuration Assistant in silent or response file mode using the following syntax:

```
C:\ORACLE_HOME\bin> dbca {-progressOnly | -silent} -responseFile local_
dir/dbca.rsp
```

where:

- `-silent` runs Oracle Database Configuration Assistant in silent mode

- `-progressOnly` runs Oracle Database Configuration Assistant in response file mode

- `local_dir` is the full path of the directory where you copied the `dbca.rsp` response file template.

For example:

```
C:\> ORACLE_HOME\bin> dbca -progressOnly -responseFile
C:\oracle_response_files\mydbca.rsp
```

As an alternative to creating a database using a response file, you can run `dbca` at the command line by specifying all the required information as command line options. Database Configuration Assistant writes progress messages to `stdout`. For information about the list of options supported, enter the following command:

```
C:\ORACLE_HOME\bin\dbca -help
```

C.6 Postinstallation Configuration Using a Response File

Use the following sections to create and run a response file configuration after installing Oracle software.

C.6.1 About the Postinstallation Configuration File

When you run a silent or response file installation, you provide information about your servers in a response file that you otherwise provide manually during a graphical user interface installation. However, the response file does not contain passwords for user accounts that configuration assistants require after software installation is complete. The configuration assistants are started with a script called `configToolAllCommands`. You can run this script in response file mode by using a password response file. The script uses the passwords to run the configuration tools in succession to complete configuration.

If you keep the password file to use for clone installations, then Oracle strongly recommends that you store it in a secure location. In addition, if you must stop an installation to fix an error, you can run the configuration assistants using `configToolAllCommands` and a password response file.

The `configToolAllCommands` password response file consists of the following syntax options:

- *internal_component_name* is the name of the component that the configuration assistant configures

- *variable_name* is the name of the configuration file variable

- *value* is the desired value to use for configuration.

The command syntax is as follows:

internal_component_name|variable_name=value

For example:

```
oracle.assistants.asm|S_ASMPASSWORD=welcome
```

Oracle strongly recommends that you maintain security with a password response file:

- Permissions on the response file should be set to 600.

- The owner of the response file should be the installation owner user, with the group set to the central inventory (oraInventory) group.

C.6.2 Running Postinstallation Configuration Using a Response File

To run configuration assistants with the `configToolAllCommands` script:

1. Create a response file using the syntax *filename*.properties. For example:

   ```
   C:\> copy nul cfgrsp.properties
   ```

2. Open the file with a text editor, and cut and paste the password template, modifying as needed.

Example C–1   Password response file for Oracle Grid Infrastructure for a standalone server

Oracle Grid Infrastructure requires passwords for Oracle Automatic Storage Management Configuration Assistant (ASMCA), and for Intelligent Platform Management Interface Configuration Assistant (IPMICA) if you have a BMC card and you want to enable this feature. Provide the following response file,

```
oracle.assistants.asm|S_ASMPASSWORD=password
oracle.assistants.asm|S_ASMMONITORPASSWORD=password
```

Example C–2   Password response file for Oracle Database

Oracle Database configuration requires the SYS, SYSTEM, SYSMAN, and DBSNMP passwords for use with Database Configuration Assistant (DBCA). The S_ASMSNMPPASSWORD password is necessary only if the database is using Oracle ASM for storage. Also, if you selected to configure Oracle Enterprise Manager, then you must provide the password for the Oracle software installation owner for the S_HOSTUSERPASSWORD password.

```
oracle.assistants.server|S_SYSPASSWORD=password
oracle.assistants.server|S_SYSTEMPASSWORD=password
```

```
oracle.assistants.server|S_SYSMANPASSWORD=password
oracle.assistants.server|S_DBSNMPPASSWORD=password
oracle.assistants.server|S_HOSTUSERPASSWORD=password
oracle.assistants.server|S_ASMSNMPPASSWORD=password
```

If you do not want to enable Oracle Enterprise Manager or Oracle ASM, then leave those password fields blank

3. Secure the cfgrsp.properties file by changing permissions in Properties page. Right-click the file to open the Properties page. Select the **Security** tab, click the **Edit** button, select a group or user, then select **Deny** check box against Read permissions to remove read access for unwanted users.

4. Change directory to `ORACLE_HOME\cfgtoollogs`

5. Before running `configToolAllCommands`, rename it using the following command:

   ```
   copy configToolAllCommands configToolAllCommands.bat
   ```

6. Run the configuration script using the following syntax:

   ```
   configToolAllCommands.bat RESPONSE_FILE=\path\name.properties
   ```

   for example:

   ```
   C:\> configToolAllCommands.bat RESPONSE_FILE=C:\oracle\cfgrsp.properties
   ```

D

Configuring Oracle Database Globalization Support

This appendix describes the following Globalization Support topics:

- Installing and Using Oracle Components in Different Languages
- Running Oracle Universal Installer in Different Languages

> **See Also:** *Oracle Database Globalization Support Guide* for an overview of globalization support for Oracle Database

D.1 Installing and Using Oracle Components in Different Languages

This section describes the following procedures:

- Configuring Oracle Components to Run in Different Languages
- Installing Translation Resources

D.1.1 Configuring Oracle Components to Run in Different Languages

You can specify the language and the territory, or locale, in which you want to use Oracle components. The locale setting of a component determines the language of the user interface of the component and the globalization behavior, such as date and number formatting. Depending on the Oracle component, the locale of the component is either inherited from the operating system session that started the component, or is defined by the NLS_LANG environment variable.

The operating system locale usually influences Oracle components that are based on Java technology. The NLS_LANG environment variable usually influences Oracle components that use Oracle Client libraries such as OCI.

> **Note:** The user interface of an Oracle component is displayed in a selected language only if the appropriate translation is available and has been installed. Otherwise, the user interface is displayed in English.

This section describes the following procedures:

- Determining the Operating System Locale
- Configuring Locale and Character Sets Using the NLS_LANG Environment Variable
- NLS_LANG Settings in Console Mode and Batch Mode

D.1.1.1 Determining the Operating System Locale

The locale setting of your operating system session determines the language of the user interface and the globalization behavior for components such as Oracle Universal Installer, Oracle Net Configuration Assistant, and Oracle Database Configuration Assistant. It also determines the globalization behavior of Oracle Database sessions created by a user application through Oracle JDBC driver, unless overridden by the application.

To set locale for the current operating system user on Windows XP, Windows 2003, and Windows Server 2003 R2, select the desired locale from the pop-up list in Standards and formats area on the Regional Options tab. On Windows Vista, Windows Server 2008, and later versions, select the desired locale from the Current format pop-up list on the Formats tab.

Some of the locales may be unavailable until you install required operating system support files. On Windows XP, Windows 2003, and Windows Server 2003 R2, make sure the relevant check boxes are checked in Supplemental language support area on Languages tab.

Some Oracle components, such as SQL*Plus, require that the Windows System Locale is also set to the language in which the components are to be run. System Locale is called Language for non-Unicode programs on Windows XP, Windows 2003, and Windows 2003 R2. On Windows XP and Windows 2003, select the locale from the pop-up list in the Language for non-Unicode programs area on the Advanced tab. On Windows Vista, Windows Server 2008, and later versions, click the **Change system locale...** button on the Administrative tab, accept the use of administrative privileges, if User Account Control is active, and select the locale from the pop-up list in the opened dialog box.

> **Note:**   The operating system must be restarted after the System Locale is changed. See the operating system documentation for further information about Windows locale settings.

D.1.1.2 Configuring Locale and Character Sets Using the NLS_LANG Environment Variable

The `NLS_LANG` environment variable determines the language of the user interface and the globalization behavior for components such as SQL*Plus, exp, and imp. It sets the language and territory used by the client application and the database user session. It also declares the character set for entering and displaying data by the client application.

The `NLS_LANG` environment variable uses the following format:

```
NLS_LANG=language_territory.characterset
```

In this format:

- `language` specifies the language used for displaying Oracle messages, sorting, day names, and month names

- `territory` specifies the conventions for default date, monetary and numeric formats

- `characterset` specifies the encoding used by the client application

  In most cases, this is the Oracle character set that corresponds to the Windows ANSI Code Page as determined by the System Locale.

The `NLS_LANG` parameter on Windows can be set

- in Registry under the subkey corresponding to a given Oracle home,

- as an environment variable.

When you install Oracle Database components and the `NLS_LANG` parameter is not yet set in the Registry subkey of the target Oracle home, Oracle Universal Installer sets the `NLS_LANG` parameter to a default value derived from the operating system locale for the current user. See the following table.

> **See Also:**
>
> - *Oracle Database Platform Guide for Microsoft Windows* for more information about the subkey locations for multiple Oracle homes
>
> - *Oracle Database Globalization Support Guide* for information about the `NLS_LANG` parameter and Globalization Support initialization parameters

For example:

- Arabic (U.A.E.) - `ARABIC_UNITED ARAB EMIRATES.AR8MSWIN1256`

- Chinese (PRC) - `SIMPLIFIED CHINESE_CHINA.ZHS16GBK`

- Chinese (Taiwan) - `TRADITIONAL CHINESE_TAIWAN.ZHT16MSWIN950`

- English (United Kingdom) - `ENGLISH_UNITED KINGDOM.WE8MSWIN1252`

- English (United States) - `AMERICAN_AMERICA.WE8MSWIN1252`

- French (Canada) - `CANADIAN FRENCH_CANADA.WE8MSWIN1252`

- French (France) - `FRENCH_FRANCE.WE8MSWIN1252`

- German (Germany) - `GERMAN_GERMANY.WE8MSWIN1252`

- Hebrew - `HEBREW_ISRAEL.IW8MSWIN1255`

- Japanese - `JAPANESE_JAPAN.JA16SJISTILDE`

- Russian - `RUSSIAN_RUSSIA.CL8MSWIN1251`

- Spanish (Spain) - `SPANISH_SPAIN.WE8MSWIN1252`

- Spanish (Mexico) - `MEXICAN SPANISH_MEXICO.WE8MSWIN1252`

- Spanish (Venezuela) - `LATIN AMERICAN SPANISH_VENEZUELA.WE8MSWIN1252`

D.1.1.3 NLS_LANG Settings in Console Mode and Batch Mode

Before you can use Oracle utilities such as SQL*Plus, SQL Loader, Import, and Export from the Command Prompt window, you may have to set the character set field of the `NLS_LANG` parameter to a value different than the one set in Registry.

This is required because programs running in console mode use, with a few exceptions, a different code page (character set) from programs running in GUI mode. The default Oracle home `NLS_LANG` parameter in the Registry is always set to the appropriate GUI code page. If you do not set the `NLS_LANG` parameter for the console mode session correctly, incorrect character conversion can corrupt error messages and data.

For Japanese, Korean, Simplified Chinese, Traditional Chinese, Thai, and Vietnamese, the console (OEM) code page is identical to the GUI (ANSI) code page. In this case, you are not required to set the `NLS_LANG` parameter. For other languages, set the

correct character set value of NLS_LANG by issuing a SET NLS_LANG command in the same Command Prompt window in which you want to start the affected utility.

Similarly, in batch mode, set the correct character set value of NLS_LANG by inserting a SET NLS_LANG command at the start of the batch procedure, according to the character set of the files to be processed in the procedure.

To find the current console code page, issue the CHCP command in the Command Prompt window. Use the reported code page number to look up the corresponding Oracle character set name in Table D–1.

Table D–1 lists the Oracle character sets that correspond to the console mode code pages.

Table D–1   Oracle Character Sets for Console Mode (OEM) Code Pages

OEM Code Page	Oracle Character Set for Console Mode
437 (US)	US8PC437
737 (Greek)	EL8PC737
775 (Baltic)	BLT8PC775
850 (Multilingual Latin I)	WE8PC850
852 (Latin II)	EE8PC852
855 (Cyrillic)	RU8PC855
857 (Turkish)	TR8PC857
858 (Multilingual Latin I + Euro)	WE8PC858
866 (Russian)	RU8PC866
874 (Thai)	TH8TISASCII
932 (Japanese Shift-JIS)	JA16SJISTILDE
936 (Simplified Chinese GBK)	ZHS16GBK
949 (Korean)	KO16MSWIN949
950 (Traditional Chinese Big5)	ZHT16MSWIN950
1258 (Vietnam)	VN8MSWIN1258

D.1.2 Installing Translation Resources

To view the user interface of Oracle components in different languages, you must install the appropriate language translations along with the component.

> **Note:**   Part of Oracle Database Vault user interface text is stored in database tables in the DVSYS schema. By default, only the English language is loaded into these tables. You can use Oracle Database Vault Configuration Assistant to add more languages to Oracle Database Vault. For the necessary steps, see Appendix C in *Oracle Database Vault Administrator's Guide*

To install translation resources:

1.   Start Oracle Universal Installer.

2. In the Configure Security Updates screen enter the relevant information and click **Next**.

3. In the Download Software Updates and Apply Software Updates screens, enter the relevant information and click **Next**.

4. In the Select Installation Option screen, select the installation option and click **Next**.

5. In the System Class screen, select the type of system class for installing the database, and click **Next**.

6. In the Grid Installation Options screen, select the type of database installation you want to perform, and click **Next**.

7. In the Select Product Languages screen, select the language in which you want to run the product from the **Available Languages** field.

> **Note:** The Available Languages field lists all languages supported by Oracle globalization libraries. The set of languages for which a translation is actually available is usually smaller and depends on a particular component. The scope of translation for a given component may differ between languages. For example, some translations may include all user interface text, while others may include only error messages and no help files.

8. Use the > arrow to move the selected language to the **Selected Languages** field, and then click **Next**.

> **Note:** Oracle Universal Installer ignores languages in the Selected Languages field for which no translation is available.

D.2 Running Oracle Universal Installer in Different Languages

The operating system locale determines the language in which Oracle Universal Installer runs. Oracle Universal Installer may run in one of the following languages:

- Brazilian Portuguese
- English
- French
- German
- Italian
- Japanese
- Korean
- Simplified Chinese
- Spanish
- Traditional Chinese

To run Oracle Universal Installer in a desired language

1. Change the locale for the operating system user and the System Locale as described in the "Determining the Operating System Locale" section.

2. Run Oracle Universal Installer by following the instructions in the "Installing the Oracle Database Software" section.

If the selected language is not one of the listed earlier, Oracle Universal Installer runs in English.

E

Managing Oracle Database Port Numbers

This appendix lists the default port numbers and describes how to change the assigned port after installation:

- About Managing Ports
- Viewing Port Numbers and Access URLs
- Port Numbers and Protocols of Oracle Components
- Changing the Oracle Enterprise Management Agent Port
- Changing the Oracle Enterprise Manager Database Control Ports
- Changing the Oracle Services for Microsoft Transaction Server Port

E.1 About Managing Ports

During installation, Oracle Universal Installer assigns port numbers to components from a set of default port numbers. Many Oracle Database components and services use ports. As an administrator, it is important to know the port numbers used by these services, and to ensure that the same port number is not used by two services on your host.

Most port numbers are assigned during installation. Every component and service has an allotted port range, which is the set of port numbers Oracle Database attempts to use when assigning a port. Oracle Database starts with the lowest number in the range and performs the following checks:

- Is the port used by another Oracle Database installation on the host?

  The installation may be up or down at the time; Oracle Database can still detect if the port is used.

- Is the port used by a process that is currently running?

  This could be any process on the host, even a non-Oracle Database process.

If the answer to any of the preceding questions is yes, Oracle Database moves to the next highest port in the allotted port range, and continues checking until it finds a free port.

E.2 Viewing Port Numbers and Access URLs

In most cases, the port number of the Oracle Database component is listed in the tool used to configure the port. In addition, ports for some Oracle Database applications are listed in the `portlist.ini` file. This file is located in the *ORACLE_HOME*\install directory.

If you change a port number, it is not updated in the `portlist.ini` file, so you can only rely on this file immediately after installation. To find or change a port number, use the methods described in this appendix.

E.3 Port Numbers and Protocols of Oracle Components

Table E–1 lists the port numbers and protocols used by components that are configured during the installation. By default, the first port in the range is assigned to the component, if it is available.

Table E–1   Ports Used in Oracle Components

Component and Description	Default Port Number	Port Range	Protocol
Oracle Net Listener Allows Oracle client connections to the database by using Oracle Net services. You can configure this port number during installation. To reconfigure this port, use Net Configuration Assistant.	1521	1024-65535	TCP
Connection Manager Listening port for Oracle client connections. It is not configured during installation, but can be configured using Net Configuration Assistant.	1630	1630	TCP
Oracle Enterprise Manager Database Control HTTP port for Enterprise Manager Database Control. It is configured during installation. "Changing the Oracle Enterprise Manager Database Control Ports" on page E-3 explains how to modify its port number.	1158	5500–5519	HTTP
Oracle Enterprise Manager Database Control RMI port for Enterprise Manager Database Control. It is configured during installation."Changing the Oracle Enterprise Manager Database Control Ports" on page E-3 explains how to modify its port number.	5520	5520–5539	TCP
Oracle Enterprise Manager Database Control JMS port for Enterprise Manager Database Control. It is configured during installation. "Changing the Oracle Enterprise Manager Database Control Ports" on page E-3 explains how to modify its port number.	5540	5540–5559	TCP
Enterprise Manager Database Control Agent HTTP port for Oracle Management Agent, which is part of Oracle Enterprise Manager. It is configured during installation. "Changing the Oracle Enterprise Management Agent Port" on page E-3 explains how to modify its port number	3938	1830–1849	HTTP
Oracle XML DB The Oracle XML DB HTTP port is used if Web-based applications need to access an Oracle database from an HTTP listener. It is configured during installation, but you cannot view it afterward. **See Also**: "Using HTTP(S) on a Standard Port Instead of an Oracle XML DB Default Port" in *Oracle XML DB Developer's Guide*	0	Configured Manually	HTTP

Table E–1 (Cont.) Ports Used in Oracle Components

Component and Description	Default Port Number	Port Range	Protocol
Oracle XML DB The Oracle XML DB FTP is used when applications need to access an Oracle database from an FTP listener. It is configured during installation, but you cannot view it afterward. **See Also**: "Using FTP on the Standard Port Instead of the Oracle XML DB Default Port" in *Oracle XML DB Developer's Guide*	0	Configured Manually	FTP
Cluster Synchronization Service (CSS) CSS service internode connection for Group Manager. The port number is assigned automatically. You cannot view or modify it afterward.	42424	Dynamic	TCP
Oracle Cluster Registry The port number is assigned automatically during installation. You cannot view or modify it afterward.	Dynamic	Dynamic	TCP
Oracle Services for Microsoft Transaction Server The port number for Microsoft Transaction Server is configured when you enter its value in Oracle Universal Installer the first time you install the software on a particular server. If you install the software in multiple Oracle homes on the same server, then Oracle Universal Installer uses the same port number that you specified during the first installation. In most cases, you do not have to reconfigure the port number. "Changing the Oracle Services for Microsoft Transaction Server Port" on page E-3 explains how to change its port number.	Dynamic	49152-65535	TCP

> **See Also:** *Oracle Real Application Clusters Installation Guide for Microsoft Windows x64 (64-Bit)* for a list of clusterware ports used in Oracle components

E.4 Changing the Oracle Enterprise Management Agent Port

To find the current setting for the Oracle Management Agent port, search for `EMD_URL` in the `ORACLE_HOME\host_sid\sysman\config\emd.properties` file.

To change the Oracle Management Agent HTTP port, use the `emca -reconfig ports` command:

```
emca -reconfig ports -AGENT_PORT 1831
```

E.5 Changing the Oracle Enterprise Manager Database Control Ports

To find the current HTTP, RMI, and JMS port settings, search in the following files:

- **HTTP port**: Search for `REPOSITORY_URL` in the `ORACLE_HOME\host_sid\sysman\config\emd.properties` file.

- **RMI port**: Search for the `port` attribute in the `rmi-server` tag in the `ORACLE_HOME\oc4j\j2ee\OC4J_DBConsole_host_sid\config\rmi.xml` file.

- **JMS port**: Search for the `port` attribute in the `jms-server` tag in the *ORACLE_HOME*\oc4j\j2ee\OC4J_DBConsole_*host_sid*\config\jms.xml file.

To change the Oracle Enterprise Manager Database Control ports, use the `emca -reconfig` ports command:

```
ORACLE_HOME\bin> emca -reconfig ports option setting
```

where *option* can be:

- `DBCONTROL_HTTP_PORT`: Sets the HTTP port, for example:

    ```
    emca -reconfig ports -DBCONTROL_HTTP_PORT 1820
    ```

- `RMI_PORT`: Sets the RMI port, for example:

    ```
    emca -reconfig ports -RMI_PORT 5520
    ```

- `JMS_PORT`: Sets the JMS port, for example:

    ```
    emca -reconfig ports -JMS_PORT 5521
    ```

You can enter multiple `-reconfig port` settings in one line, for example:

```
emca -reconfig ports -DBCONTROL_HTTP_PORT 1820 -AGENT_PORT 1821 -RMI_PORT 5520
```

E.6 Changing the Oracle Services for Microsoft Transaction Server Port

In most cases, you are not required to reconfigure the port number. If you must, then you can use the Registry Editor to edit its value in the `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\OracleMTSRecoveryService\Protid_0` Registry Editor key to any available port within the range `1024 to 65535`.

During installation, Oracle Universal Installer takes the value for the port from the key, if it exists. Otherwise, a free port ranging from `49152 to 65535` is chosen.

F

Troubleshooting the Oracle Database Installation

This appendix contains the following information about troubleshooting:

- Verifying Requirements
- Encountering Installation Errors
- Reviewing the Log of an Installation Session
- Silent Mode Response File Error Handling
- Troubleshooting Host Name Changes and CSS
- Troubleshooting Configuration Assistants
- Troubleshooting Inventory Issues
- Troubleshooting Screen Display Issues
- Cleaning Up After a Failed Installation

> **See Also:**
>
> - Chapter 7, "Removing Oracle Database Software"
> - Chapter 6, "Troubleshooting Oracle Configuration Manager" in *Oracle Configuration Manager Installation and Administration Guide* for information about some errors that may occur while using Oracle Configuration Manager and tips to troubleshoot these errors

F.1 Verifying Requirements

Before you try any of the troubleshooting steps in this appendix, do the following:

- Check Chapter 2, "Oracle Database Preinstallation Requirements" to ensure that the system meets the requirements and that you have completed all of the preinstallation tasks.
- Read the release notes for the product on your platform before installing it. The release notes are available on the Oracle Database installation media. You can find the latest version of the release notes on the Oracle Technology Network Web site:

  http://www.oracle.com/technetwork/index.html

F.2 Encountering Installation Errors

If you encounter an error during installation:

- Do not exit Oracle Universal Installer.

- If you clicked **Next** after you entered incorrect information about one of the installation windows, click **Back** to return to the window and correct the information.

- If you encounter an error while Oracle Universal Installer is copying or linking files, see "Reviewing the Log of an Installation Session" on page F-2 for interactive installations or "Silent Mode Response File Error Handling" on page F-2 for more information.

- If you encounter an error while a configuration assistant is running, see the "Troubleshooting Configuration Assistants" section on page F-3.

- If you cannot resolve the problem, remove the failed installation by following the steps listed in the "Cleaning Up After a Failed Installation" section on page F-4.

F.3 Reviewing the Log of an Installation Session

During an installation, Oracle Universal Installer records all the actions that it performs in a log file. If you encounter problems during the installation, review the log file for information about possible causes of the problem. By default, the log files are located in the following directory:

```
SYSTEM_DRIVE:\Program Files\Oracle\Inventory\logs
```

Log filenames from interactive installations take the form:

```
installActionsdate_time.log
oraInstalldate_time.err
oraInstalldate_time.out
```

For example, if an interactive installation occurred at 9:00:56 a.m. on October 14, 2005, the log file would be named:

```
installActions2005-10-14_09-00-56AM.log
```

> **Note:** Do not delete or manually alter the Inventory directory or its contents. Doing so can prevent Oracle Universal Installer from locating products that you install on your system.

See Also: Silent Mode Response File Error Handling on page F-2

F.4 Silent Mode Response File Error Handling

To determine whether a silent-mode installation succeeds or fails, check the silentInstallActionsdate_time.log file, located in DRIVE_LETTER:\Program Files\Oracle\Inventory\logs.

If necessary, see the previous section for information about determining the location of the Inventory directory.

A silent installation fails if:

- You do not specify a response file.

- You specify an incorrect or incomplete response file.

- Oracle Universal Installer encounters an error, such as insufficient disk space.

Oracle Universal Installer or a configuration assistant validates the response file at run time. If the validation fails, the silent-mode installation or configuration process ends.

> **See Also:** "Reviewing the Log of an Installation Session" on page F-2 for information about interactive installation log files

F.5 Troubleshooting Host Name Changes and CSS

If you change the host name for Oracle Automatic Storage Management, then the Oracle CSS service does not start. To solve this issue, perform the following steps:

1. Log in as a user with Administrator privileges.

2. Run `roothas.pl` to deconfigure CSS.

   ```
   C:\> cd \app\oracle\product\11.2.0\grid\crs\install
   perl roothas.pl -deconfig -force
   ```

   This removes any configuration related files on the system that referenced the old host name.

3. Run `gridconfig.bat` script to reconfigure CSS using the new host name:

   ```
   C:\> cd \app\oracle\product\11.2.0\grid\crs\config
   gridconfig.bat
   ```

4. Go to the grid home's `bin` directory. Use the `srvctl add database` command with the `-c SINGLE` flag to add the database in an Oracle Restart configuration. Also use the `srvctl add` command to add the listener, the Oracle ASM instance, all Oracle ASM disk groups, and any database services to the Oracle Restart configuration.

   > **See Also:** "srvctl add" in *Oracle Database Administrator's Guide*

F.6 Troubleshooting Configuration Assistants

To troubleshoot an installation error that occurs when a configuration assistant is running:

- Review the installation log files listed in the "Reviewing the Log of an Installation Session" section on page F-2.

- Review the specific configuration assistant log file located in the *ORACLE_BASE*\cfgtoollogs directory. Try to fix the issue that caused the error.

  > **Note:** Ensure that there is no space in the path.

- If you see the "Fatal Error. Reinstall message", look for the cause of the problem by reviewing the log files. See "Irrecoverable Errors" on page F-4 for more information.

F.6.1 Configuration Assistant Failures

Oracle configuration assistant failures are noted at the bottom of the installation window. The configuration assistant interface displays additional information, if available. The configuration assistant execution status is stored in the installActions*date_time*.log file.

The execution status codes are listed in the following table:

Status	Result Code
Configuration assistant succeeded	0
Configuration assistant failed	1
Configuration assistant canceled	-1

F.6.2 Irrecoverable Errors

If you receive an irrecoverable error while a configuration assistant is running:

1. Remove the failed installation as described in the "Cleaning Up After a Failed Installation" section on page F-4.

2. Correct the cause of the irrecoverable error.

3. Reinstall the Oracle software.

F.7 Troubleshooting Inventory Issues

If you face any of the following situations for Oracle home, then run the `opatch lsinventory -detail` command to list the contents of the inventory and see section "Recovering from inventory corruption" in the *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for information about fixing the issue.

- Oracle home is cloned without completing the inventory steps.

- There is bad inventory.

- Inventory is not available but it is created when the Oracle Enterprise Manager Agent is installed in a separate Oracle home.

F.8 Troubleshooting Screen Display Issues

If you connect to Oracle database with the screen resolution 640 X 480 or 800 X 600, then the Next button in the GUI is not visible as it hides behind the Taskbar. In order to counter this problem, do one of the following:

- Hide the Taskbar.

- Move the Oracle Universal Installer screen up.

- Set the screen resolution to 1024 X 768 or higher.

F.9 Cleaning Up After a Failed Installation

If an installation fails, you must remove files that Oracle Universal Installer created during the attempted installation and remove the Oracle home directory.

Follow the instructions in "Removing Oracle Database Software" to run the Deinstallation tool.

G

Frequently Asked Questions About Installation

Use the following guidelines to decide how to install Oracle Database components:

- Installing Oracle Database or Oracle Database Client
- Installing Oracle Database Tools
- Installing Oracle Database with Oracle Applications
- Installing Oracle Database Heterogeneous Connectivity Tools (Gateways)

G.1 Installing Oracle Database or Oracle Database Client

The following are frequently asked questions about installing Oracle database:

- I only need one instance of Oracle Database or I just want to install a test database to get familiar with the product. How do I install Oracle Database for these situations?
- How can I create an Oracle database that can handle transaction-heavy or data warehousing applications?
- What's the best way to install multiple Oracle databases?
- How do I configure client connections to an Oracle database?
- What is the best way to install Oracle Database Client if my client nodes have limited disk space?
- How do I upgrade Oracle Database?
- The computers at my site have been configured to run as a cluster. How should I install Oracle Database?
- How do I migrate my non-Oracle databases to Oracle Database?

I only need one instance of Oracle Database or I just want to install a test database to get familiar with the product. How do I install Oracle Database for these situations?

- If you want a quick installation using the default installation settings, then see the platform-specific *Oracle Database Quick Installation Guide*.
- If your site has special requirements, then see this guide for more information.

How can I create an Oracle database that can handle transaction-heavy or data warehousing applications?

If you want to create a starter database designed for transaction-heavy or data warehousing applications, then see this guide for more details. Select the **Advanced Installation** method, and then select the database type you want on the Select Database Configuration screen.

> **See Also:** *Oracle Database Data Warehousing Guide* after installation

Alternatively, you can install Oracle OLAP during the Oracle Database installation. Oracle OLAP provides optimal support for database environments that must meet OLAP requirements. To do so, in the Select Database Edition screen, select **Enterprise Edition**. Click the Select Options button, and from the Choose Components screen, select **Oracle OLAP**.

> **See Also:**
>
> - *Oracle OLAP User's Guide*
> - *Oracle OLAP DML Reference*
> - *Oracle OLAP Java API Reference*

What's the best way to install multiple Oracle databases?

Use this guide to install Oracle Database using either of the following methods:

- **Installing with response files**: This method lets you run Oracle Universal Installer at a command line using a response file that contains settings specific to each computer.

- **Cloning a database**: Install Oracle Database on one computer using interactive mode. You can also clone databases. The instructions for cloning databases are described in *Oracle Database Administrator's Guide*.

How do I configure client connections to an Oracle database?

1. Install Oracle Database on a server by using this guide for more information.

2. Use platform-specific *Oracle Database Client Installation Guide* to install Oracle Database Client on each client node, and select the Instant Client installation type.

   If you have many client nodes, consider staging the software centrally, mapping the drive, and running Oracle Universal Installer in the silent or response file mode.

   If the client nodes only require a default installation into a new Oracle home directory, consider using this guide for more information.

What is the best way to install Oracle Database Client if my client nodes have limited disk space?

1. Install Oracle Database onto a server by using this guide for more details.

2. Use platform-specific *Oracle Database Client Installation Guide* to install Oracle Database Client on each client node, and select the Instant Client installation type.

   If you have many client nodes, then consider running Oracle Universal Installer in silent or response file mode.

How do I upgrade Oracle Database?

See *Oracle Database Upgrade Guide*.

> **See Also:** *Oracle Database Administrator's Guide* for more information about using software cloning to upgrade Oracle Database

The computers at my site have been configured to run as a cluster. How should I install Oracle Database?

Use any of the following installation scenarios:

- If you want to run a single-instance Oracle Database in a clustered environment, then install Oracle Grid Infrastructure either before or after you install Oracle Database.

- If you want a consolidated pool of storage for all databases in a cluster, then install Oracle Grid Infrastructure, and use Oracle Automatic Storage Management (Oracle ASM) to manage this storage. Afterward, install Oracle Database (which can be either a single instance database or Real Application Clusters).

- If you plan to use Oracle Real Application Clusters, first install Oracle Grid Infrastructure, and then install Oracle Real Application Clusters.

Refer to platform-specific *Oracle Grid Infrastructure Installation Guide* and *Oracle Real Application Clusters Installation Guide* for your platform to install Oracle Grid Infrastructure and Oracle Real Application Clusters. Oracle Clusterware is installed in an Oracle Grid Infrastructure installation. Refer to this guide for information about how to install Oracle ASM and Oracle Database.

Oracle Clusterware is a key component required by Oracle Real Application Clusters installations. Oracle Clusterware is an integrated cluster management solution that can bind multiple servers to act as a single system. This is referred to as a cluster. It performs workload management and component restart. For example, when an instance supporting a particular service fails, Oracle Clusterware restarts the service on the next available instance that you have configured for that service. Oracle Clusterware can monitor non-Oracle programs, if they are defined within the Oracle Clusterware environment using the High Availability API.

How do I migrate my non-Oracle databases to Oracle Database?

Use Oracle SQL Developer to migrate your non-Oracle databases and applications to Oracle. Oracle SQL Developer software and documentation is available at:

http://www.oracle.com/technetwork/developer-tools/sql-developer/overview/index.html

G.2 Installing Oracle Database Tools

The following are frequently asked questions about installing Oracle database tools:

- How do I install Oracle WebLogic Server?

- How can I administer and monitor my Oracle Database products?

- How do I manage security for my Oracle Database products?

- How do I use Oracle Database to manage my XML data?

- Does Oracle Database provide OLAP tools so that I can analyze data such as trends and time series in my database?

- Does Oracle Database provide data mining tools that I can use to discover hidden meaning in my data and predict likely outcomes based on my data?

- How do I perform backup and recovery operations for Oracle Database?

- Is Oracle Workflow included with Oracle Database 11g?

- Is there a migration plan for customers that have built solutions using Oracle Workflow?

How do I install Oracle WebLogic Server?

Refer to *Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*.

For more information about Oracle WebLogic Server refer to the product documentation at

http://www.oracle.com/technetwork/middleware/weblogic/documentation/index.html

How can I administer and monitor my Oracle Database products?

To perform regular administrative functions such as creating, configuring, or deleting databases, or managing database templates, use one of the following methods:

To manage only the single database and listener that you are installing:

1. Use this guide to install Oracle Database.

2. From Oracle Database, use Database Configuration Assistant to manage your databases.

   You can also administer and monitor the database with Oracle Enterprise Manager Grid Control, which is installed by default with Oracle Database. Oracle Enterprise Manager Grid Control requires an agent which is not installed by default.

   Oracle Enterprise Manager Grid Control includes the Oracle Management Agent, Oracle Management Service, and Oracle Management Repository, as well as Grid Control, a browser-based central console through which administrators can perform all monitoring, administration, and configuration tasks for the enterprise.

   > **See Also:** *Oracle Enterprise Manager Grid Control Basic Installation Guide* available on the Enterprise Manager Grid Control installation media
   >
   > Documentation available on the Oracle Technology Network website at:
   >
   > http://www.oracle.com/technetwork/indexes/documentation/index.html

To perform advanced administration tasks, such as monitoring Oracle Database and managing multiple hosts, application servers, and databases including the one that you are installing, install Oracle Enterprise Manager as follows:

1. Use this guide to install Oracle Database.

   If you plan to use Oracle Real Application Clusters, then install Oracle Database by using platform-specific *Oracle Grid Infrastructure Installation Guide* and *Oracle Real Application Clusters Installation Guide* .

2. Use *Oracle Enterprise Manager Grid Control Basic Installation Guide* to install and configure Oracle Enterprise Manager. For postconfiguration tasks, use *Oracle Enterprise Manager Grid Control Advanced Installation and Configuration Guide*.

   See the documentation available on Oracle Technology Network website at:

   http://www.oracle.com/technetwork/indexes/documentation/index.html

How do I manage security for my Oracle Database products?

Oracle provides a wide range of security solutions for your enterprise environment, including centralized administration and security features integrated with Oracle Internet Directory. The set of Oracle security services called Oracle Platform Security integrates the security features built into Oracle Database, Oracle WebLogic Server, and the Oracle Identity Management infrastructure. Combined, these features enable the development and deployment of secure e-business applications.

Oracle Identity Management includes Oracle Internet Directory, a centralized repository that simplifies administration of users and applications in the Oracle environment with the following components:

- Oracle Internet Directory client tools, including LDAP command-line tools, the Oracle Internet Directory SDK, and Oracle Directory Manager.

- Oracle Internet Directory server components, including the directory server, the directory replication server, the directory integration server, and various tools for starting and stopping them.

Oracle Database includes the Oracle Internet Directory client tools, but not the Oracle Internet Directory server components. Oracle Database includes the Oracle Internet Directory client tools, but not the Oracle Internet Directory server components. To install the Oracle Internet Directory server components, see *Oracle Fusion Middleware Installation Guide for Oracle Identity and Access Management* and the Oracle Identity Management documentation at

http://www.oracle.com/technetwork/middleware/id-mgmt/overview/index.html

> **See Also:**
>
> - *Oracle Application Server Installation Guide* (to install Oracle Identity Management)
>
> - *Oracle Database Security Guide*
>
> - *Oracle Database Enterprise User Security Administrator's Guide*
>
> - *Oracle Label Security Administrator's Guide*
>
> - *Oracle Application Server Security Guide*
>
> - Oracle Technology Network topics on database security: http://www.oracle.com/technetwork/topics/security/whatsnew/index.html

How do I use Oracle Database to manage my XML data?

Use Oracle XML DB, which is installed as part of Oracle Database. Oracle XML DB enables you to efficiently store, generate, retrieve, query, and manage XML data on your site. Oracle XML DB provides all the advantages of a relational database, for example, allowing you to control the referential integrity of XML data with constraints and triggers. It works well with large amounts of XML data by storing it in a parsed, relational form, which improves access performance.

Oracle XML DB supports XML Type, which is a native data type for XML data, for which you can choose various storage options depending on your needs. In addition, Oracle XML DB supports XML Schema processing, structured and unstructured storage, a content repository that you can access by using common protocols (FTP, HTTP(S), and WebDAV), and SQL/XML, which is a standard for SQL with XML. For Oracle Database 11*g* Release 1 (11.1), Oracle XML DB introduced support for the XQuery language for querying, transforming, and constructing XML; the ability for

users to define their own metadata for schema-based XML; a set of new SQL functions for DML operations on XML data; and more.

You can use Oracle XML DB with Oracle XML Developer's Kit (XDK) to build applications that run on either Oracle Database or Oracle WebLogic Server.

> **See Also:**
>
> - *Oracle XML DB Developer's Guide*
> - *Oracle XML Developer's Kit Programmer's Guide*

Does Oracle Database provide OLAP tools so that I can analyze data such as trends and time series in my database?

Yes, install Oracle OLAP, which is provided in the Oracle Database installation. Oracle OLAP provides optimal support for database environments that must meet OLAP requirements.

Use either of the following methods in *Oracle Database Installation Guide* to install Oracle OLAP:

- When you run Oracle Universal Installer, in the Select Database Edition screen, select **Enterprise Edition**. Click the **Select Options** button, and from the Choose Components screen, select **Oracle OLAP**.

  > **See Also:**
  >
  > - *Oracle OLAP User's Guide*
  > - *Oracle OLAP DML Reference*
  > - *Oracle OLAP Java API Reference*

- Select the **Enterprise Edition** installation type, and then on the Select Database Configuration screen, select the **Data Warehouse** configuration.

  > **See Also:**   *Oracle Database Data Warehousing Guide* after installation

Does Oracle Database provide data mining tools that I can use to discover hidden meaning in my data and predict likely outcomes based on my data?

Yes, you must have an Oracle Enterprise Edition license to use Oracle Data Mining tools. Oracle Data Mining is an option of the Enterprise Edition, as described in Table 4–1, " Oracle Universal Installer Windows", in the Select Database Edition row.

With the Oracle Data Mining option, you can create and execute predictive and descriptive data mining models that use a variety of algorithms.

Use the following method in this guide to install Oracle Data Mining:

1. When you run Oracle Universal Installer, select the **Enterprise Edition** installation type.

2. In the Select Database Configuration screen, select the **General Purpose/Transaction Processing** configuration.

See Also: The following manuals for information about Oracle Data Mining:

- *Oracle Data Mining Concepts*
- *Oracle Data Mining Administrator's Guide*
- *Oracle Data Mining Application Developer's Guide*
- *Oracle Data Mining Java API Reference*
- *Oracle Database PL/SQL Packages and Types Reference* (search for Data Mining)
- *Oracle Database SQL Language Reference* (search for Data Mining)

How do I perform backup and recovery operations for Oracle Database?

Use Oracle Database Recovery Manager (RMAN), which is a backup and recovery tool integrated into Oracle Database. This tool satisfies the pressing demands of high-performance, manageable backup, and recovery. Recovery Manager is native to the database server, automatically tracks database structure changes, and optimizes operations accordingly. In addition, Recovery Manager is integrated with leading tape media management products, so that Oracle database backups can be integrated with your existing networked data protection infrastructure.

See Also:

- *Oracle Database Backup and Recovery User's Guide*
- *Oracle Database Backup and Recovery Reference*

Is Oracle Workflow included with Oracle Database 11*g*?

Starting with Oracle Database 11*g*, Oracle Workflow is no longer released with the database. Oracle Workflow is available with the Oracle E-Business Suite releases.

See Also: Oracle Workflow statement of direction
`http://www.oracle.com/technetwork/middleware/ias/overview/index.html`

Is there a migration plan for customers that have built solutions using Oracle Workflow?

Starting January 2006, customers are encouraged to re-create and implement workflows using Oracle BPEL Process Manager. Oracle is in the process of creating a technical migration guide to provide detailed recommendations for migrating Oracle Workflow processes to Oracle BPEL Process Manager.

See Also: Oracle Workflow statement of direction
`http://www.oracle.com/technetwork/middleware/ias/overview/index.html`

G.3 Installing Oracle Database with Oracle Applications

The following are frequently asked questions about installing Oracle database with Oracle applications:

- How do I install my Oracle applications with Oracle Database?
- How can I create Web applications that communicate with Oracle Database?

- Which Web server can my Oracle applications use?

- How can I migrate my non-Oracle applications to Oracle?

How do I install my Oracle applications with Oracle Database?

In most cases, install Oracle Database itself, then install the Oracle application. The Oracle Universal Installer for that application prompts you for the connection information. Check the application documentation requirements.

If you must implement your applications with Oracle Real Applications Clusters databases, see *Oracle Real Application Clusters Installation Guide*, and platform-specific *Oracle Grid Infrastructure Installation Guide*.

How can I create Web applications that communicate with Oracle Database?

Install Oracle Application Express and a Web server. Use this guide to install Oracle Database. Oracle Application Express is automatically installed, when you install Oracle database.

> **See Also:** *Oracle Application Express Installation Guide*

Which Web server can my Oracle applications use?

Install Oracle HTTP Server, which ships on separate media, or use the XML DB HTTP Protocol Server and the embedded PL/SQL Gateway that installs with Oracle Database 11*g* Release 2.

How can I migrate my non-Oracle applications to Oracle?

Use Oracle SQL Developer to migrate your non-Oracle applications to Oracle. Oracle SQL Developer software and documentation is available at:

http://www.oracle.com/technetwork/developer-tools/sql-developer/overview/index.html

G.4 Installing Oracle Database Heterogeneous Connectivity Tools (Gateways)

The following section discusses the Gateway products:

How can my Oracle applications access data in a non-Oracle database system?

How can my Oracle applications access data in a non-Oracle database system?

You can use Oracle Database Gateway as the connectivity tool to enable Oracle applications to access data in non-Oracle databases. The following are the functions of Oracle Database Gateway:

- Integrates a non-Oracle database into your Oracle Database environment.

- Enables Oracle PL/SQL applications to integrate with APPC-enabled transactions, or access messages in IBM Websphere MQ.

You can install the Gateway product on a computer independent of the Oracle application, Oracle database, and non-Oracle database.

For example, suppose you have the following scenario:

- Oracle Database is installed on a Linux computer.

- The Oracle application is installed on a Microsoft Windows computer and accesses data from the Oracle database on the Linux computer.

- The Oracle application needs to join data in a DB2 database on Solaris Operating System and an Oracle Database on Linux.

You have the option of installing the Database Gateway for DRDA on the Solaris computer where DB2 is running, on Linux where Oracle is running, or on a third computer.

Table G–1 lists the non-Oracle database systems that you can access from Oracle applications, and the Gateways products that are available for those systems.

Table G–1   Oracle Gateway Products

Non-Oracle Database	Oracle Gateway Products and Documentation
IBM DB2 Universal Database (UDB)	Oracle Database Gateway for DRDA. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for DRDA User's Guide*.
IBM DB2 z/OS	Oracle Database Gateway for DRDA. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for DRDA User's Guide*.
IBM DB2/400	Oracle Database Gateway for DRDA. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for DRDA User's Guide*.
WebSphere MQ	Oracle Database Gateway for WebSphere MQ. *Oracle Database Gateway for WebSphere MQ Installation and User's Guide*.
CICS/TS IMSTM	Oracle Database Gateway for APPC. Use *Oracle Database Gateway for APPC Installation and Configuration Guide for Microsoft Windows* Use *Oracle Database Gateway for APPC User's Guide*
SQL Server	Oracle Database Gateway for SQL Server. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for SQL Server User's Guide*.
Sybase Adaptive Server	Oracle Database Gateway for Sybase. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for Sybase User's Guide*.
Teradata	Oracle Database Gateway for Teradata. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for Teradata User's Guide*.
Informix Server	Oracle Database Gateway for Informix. Use *Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows* and *Oracle Database Gateway for Informix User's Guide*.

Table G–1   (Cont.) Oracle Gateway Products

Non-Oracle Database	Oracle Gateway Products and Documentation
IMS	Oracle Database Gateway for IMS. Use *Oracle Database Gateway for IMS, VSAM, and Adabas Installation and Configuration Guide for Microsoft Windows*, *Oracle Database Gateway for IMS User's Guide*, and *Oracle Connect for IMS, VSAM, and Adabas Gateways Installation and Configuration Guide for IBM z/OS*
VSAM	Oracle Database Gateway for VSAM. Use *Oracle Database Gateway for IMS, VSAM, and Adabas Installation and Configuration Guide for Microsoft Windows*, *Oracle Database Gateway for VSAM User's Guide*, and *Oracle Connect for IMS, VSAM, and Adabas Gateways Installation and Configuration Guide for IBM z/OS*.
Adabas	Oracle Database Gateway for Adabas. Use *Oracle Database Gateway for IMS, VSAM, and Adabas Installation and Configuration Guide for Microsoft Windows*, *Oracle Database Gateway for Adabas User's Guide*, and *Oracle Connect for IMS, VSAM, and Adabas Gateways Installation and Configuration Guide for IBM z/OS*.

Glossary

Oracle Automatic Storage Management disk group

A set of disk devices that **Oracle Automatic Storage Management** manages as a single unit. Each disk device can be an individual physical disk, a multiple disk device such as a RAID storage array or logical volume, or even a partition on a physical disk. You can create the Oracle Automatic Storage Management disk group when you create the **Oracle Automatic Storage Management instance**, or with Oracle Database Configuration Assistant.

Oracle Automatic Storage Management instance

The Oracle instance that manages Oracle Automatic Storage Management disk groups **Oracle Automatic Storage Management disk group**s. It is created automatically when you install and configure **Oracle Automatic Storage Management**. See also Oracle system identifier (**SID**).

Oracle Automatic Storage Management

Enables creation of a single disk group from a collection of individual disk devices. It balances I/O to the disk group across all of the devices in the disk group. It also implements striping and mirroring to improve I/O performance and data reliability.

automatic undo management mode

A mode of Oracle Database in which undo data is stored in a dedicated **undo tablespace**. Unlike in **manual undo management mode**, the only undo management that you must perform is the creation of the undo tablespace. All other undo management is performed automatically.

connect descriptor

A specially formatted description of the destination for a network connection. A connect descriptor contains destination service and network route information.

The destination service is indicated by using its service name for the Oracle Database or its Oracle system identifier (**SID**) for Oracle release 11.2 databases. The network route provides, at a minimum, the location of the **listener** through use of a network address.

connect identifier

A name, net service name, or service name that resolves to a connect descriptor. Users initiate a connect request by passing a user name and password along with a connect identifier in a connect string for the service to which they want to connect, for example:

```
SQL> CONNECT user_name@connect_identifier
Enter password: password
```

control files

Files that record the physical structure of a database and contain the database name, the names and locations of associate datafiles and online **undo tablespace**, the time stamp of the database creation, the current log sequence number, and checkpoint information.

default domain

The network domain within which most client requests take place. It can be the domain where the client resides, or a domain from which the client often requests network services. The default domain is also the client configuration parameter that determines what domain to append to unqualified network name requests. A name request is unqualified if it does not have a "." character within it.

directory naming

A **naming method** that specifies a directory server to resolve a net service name into a connect descriptor. The net service name is stored centrally in a directory server.

directory server

A Lightweight Directory Access Protocol (LDAP)-compliant directory server. A directory can provide centralized storage and retrieval of database network components, user and corporate policies preferences, user authentication, and security information, replacing client-side and server-side localized files.

external procedures

Procedure or function written in the C programming language and stored in a shared library. An Oracle server can call external procedures or functions using PL/SQL routines. For Oracle Database to connect to external procedures, the server must be configured with a net service name and the **listener** must be configured with protocol address and service information.

global database name

The full database name that uniquely distinguishes it from any other database in your network domain.

For example:

```
sales.us.example.com
```

where `sales` is the name you want to call your database and `us.example.com` is the network domain in which the database is located.

initialization parameter file

An ASCII text file that contains information needed to initialize a database and **instance**.

instance

Process associated with a running Oracle Database instance. When a database is started on a database server (regardless of the type of computer), Oracle Database allocates a memory area called the **System Global Area** and starts one or more Oracle Database processes. This combination of the System Global Area and Oracle Database processes is called an instance. The memory and processes of an instance manage the associated database's data efficiently and serve the users of the database.

installation type

A predefined component set that automatically selects which components to install. See "Oracle Database Editions" on page 1-10 for a list of installation types available with each top-level component.

Interprocess Communication (IPC)

A protocol that client applications use that resides on the same node as the **listener** to communicate with the database. IPC can provide a faster local connection than TCP/IP.

listener

A process that resides on the server and whose responsibility is to listen for incoming client connection requests and manage the traffic to the server.

When a client requests a network session with a database server, a listener receives the actual request. If the client information matches the listener information, then the listener grants a connection to the database server.

listener.ora file

A configuration file for the listener that identifies the:

■   Listener name

■   Protocol addresses on which it is accepting connection requests

■   Services for which it is listening

The listener.ora file resides in the *ORACLE_HOME*\network\admin directory.

An Oracle Database 11*g* Release 2 (11.2) does not require identification of the database service because of service registration. However, static service configuration is required for an Oracle Database 11*g* Release 2 (11.2) if you plan to use Oracle Enterprise Manager.

local naming

A **naming method** that resolves a net service name into a connect descriptor. This name is configured and stored in the **tnsnames.ora file** on each individual client.

manual undo management mode

A mode of the database in which undo blocks are stored in user-managed rollback segments.

naming method

A resolution method used by a client application to resolve a connect identifier to a network address when attempting to connect to a database service. Oracle Net Services supports the following naming methods:

■   Local naming

■   Directory naming

■   Host naming

■   External naming

net service name

A simple name for a service that resolves to a connect descriptor. Users initiate a connect request by passing a user name and password along with a net service name in a connect string for the service to which they want to connect:

```
SQL> CONNECT user_name
Enter password: password
SQL> @net_service_name
```

Depending on your needs, net service names can be stored in a variety of places, including:

- Local configuration file, tnsnames.ora, on each client

- Directory server

- External naming service, such as Network Information Service (NIS) or Cell Directory Service (CDS)

OPS$

Acronym for operating system specific. The initialization file parameter OS_AUTHENT_ PREFIX enables users to specify a prefix that Oracle uses to authenticate users attempting to connect to the database. Oracle concatenates the value of this parameter to the beginning of the user's operating system account name. When a connection request is attempted, Oracle compares the prefixed user name with Oracle user names in the database.

The default value of this parameter is "" (a null string), thereby eliminating the addition of any prefix to operating system account names. In earlier releases, OPS$ was the default setting.

ORACLE_BASE

ORACLE_BASE is the root of the Oracle Database directory tree. The Oracle Base directory is the top level directory that you can use to install the various oracle software products. You can use the same Oracle base directory for multiple installations. If you install an OFA-compliant database using Oracle Universal Installer defaults, then *ORACLE_BASE* is *X*:\oracle\product\11.2.0 where *X* is any hard drive (for example, C:\oracle\product\11.2.0).

ORACLE_HOME

Corresponds to the environment in which Oracle Database products run. This environment includes location of installed product files, PATH variable pointing to products' binary files, **registry** entries, **net service name**, and program groups.

If you install an OFA-compliant database, using Oracle Universal Installer defaults, Oracle home (known as *\ORACLE_HOME* in this guide) is located beneath *X*:*ORACLE_ BASE*. The default Oracle home is db_*n* where *n* is the Oracle home number. It contains subdirectories for Oracle Database software executables and network files. See also **Oracle home**.

Oracle home

The directory path to install Oracle components (for example, C:\app\oracle\product\11.2.0\dbhome_*n*). You are prompted to enter an Oracle home in the **Path** field of the Specify File Locations window. See also **ORACLE_HOME**.

Oracle schema

A set of rules that determine what can be stored in an LDAP-compliant directory server. Oracle has its own schema that is applied to many types of Oracle entries, including Oracle Net Services entries. The Oracle schema for Oracle Net Services entries includes the attributes the entries may contain.

Oracle Net foundation layer

A networking communication layer that establishes and maintains the connection between the client application and server, as well as exchanging messages between them.

protocol address

An address that identifies the network address of a network object.

When a connection is made, the client and the receiver of the request, such as the **listener**, or Oracle Connection Manager, are configured with identical protocol addresses. The client uses this address to send the connection request to a particular network object location, and the recipient "listens" for requests on this address. It is important to install the same protocols for the client and the connection recipient, and to configure the same addresses.

raw partitions

Portions of a physical disk that are accessed at the lowest possible disk (block) level.

redo log files

Files that contain a record of all changes made to data in the database buffer cache. If an instance failure occurs, then an administrator can use the redo log files to recover the modified data that was in memory.

registry

A Windows repository that stores configuration information for a computer.

repository

A set of tables located in any Oracle database accessible to the Oracle Management Server. Oracle Management Server uses a repository to store all system data and application data, information about the state of managed nodes distributed throughout the environment, as well as information about the separately licensable management packs.

service registration

A feature by which the PMON process (an instance background process) automatically registers information with a **listener**. Because this information is registered with the listener, the **listener.ora file** must not be configured with this static information.

Service registration provides the listener with the following information:

- Service names for each running instance of the database

- Instance names of the database

- Service handlers (dispatchers and dedicated servers) available for each instance

  This allows the listener to direct a client's request appropriately.

- Dispatcher, instance, and node load information

  This allows the listener to determine which dispatcher can best handle a client connection's request. If all dispatchers are blocked, the listener can spawn a dedicated server for the connection.

This information allows the listener to determine how best to service a client connection request.

SID

The Oracle system identifier that distinguishes the database from all other databases on your computer. The SID automatically defaults to the database name portion of the global database name (sales in the example sales.us.example.com) until you reach eight characters or enter a period. You can accept or change the default value.

The SID can also see an Oracle Automatic Storage Management instance SID, available when you install **Oracle Automatic Storage Management**.

sqlnet.ora file

A configuration file for the client or server that specifies the:

- Client domain to append to unqualified service names or net service names

- Order of naming methods for the client to use when resolving a name

- Logging and tracing features to use

- Route of connections

- External naming parameters

- Oracle Advanced Security parameters

The sqlnet.ora file resides in *ORACLE_HOME*\network\admin.

Secure Sockets Layer (SSL)

An industry standard protocol designed by Netscape Communications Corporation for securing network connections. SSL provides authentication, encryption, and data integrity using public key infrastructure (PKI).

SSL

See **Secure Sockets Layer (SSL)**.

System Global Area

A group of shared memory structures that contain data and control information for an Oracle Database **instance**.

system identifier

See **SID**.

tablespace

A logical storage unit within a database. Tablespaces are divided into logical units of storage called segments, which are further divided into extents.

tnsnames.ora file

A configuration file that contains net service names mapped to connect descriptors. This file is used for the local naming method. The tnsnames.ora file resides in *ORACLE_HOME*\network\admin.

undo tablespace

An tablespace that contains one or more undo segments. The creation of any other types of segment (for example, tables, indexes) in undo tablespaces is not allowed.

In the automatic mode, each Oracle instance is assigned one and only one undo tablespace. Each undo tablespace is composed of a set of undo files. Undo blocks are grouped in extents. At any point in time, an extent is either allocated to (and used by) a transaction table, or is free.

Blocks in undo tablespaces are grouped into the following categories:

- File control blocks, bitmap blocks, and so forth used for space management

- Undo segments containing transaction table blocks, undo blocks, and extent-map blocks used for transaction management

- Free blocks that are unallocated to file control or undo segments

unqualified name

A net service name that does not contain a network domain.

User Account Control

A Microsoft Windows feature that helps prevent unauthorized changes by asking for permission or administrator privileges to perform certain operations. Some Oracle administration tasks require Windows administrator privileges granted through User Account Control.

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