

Oracle® Database

Installation Guide

10g Release 2 (10.2) for Microsoft Windows (x64)

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Oracle Database Installation Guide 10g Release 2 (10.2) for Microsoft Windows (x64)

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Preface

This guide provides instructions about installing and configuring Oracle Database for Microsoft Windows (x64). Only the features of Oracle Database for Microsoft Windows (x64) software installed on the Windows Server 2003 and Windows XP Professional operating systems are discussed in this guide.

This preface contains these topics:

- [Audience](#)
- [Documentation Accessibility](#)
- [Related Documentation](#)
- [Conventions](#)

Audience

Oracle Database Installation Guide for Microsoft Windows (x64) is intended for anyone installing Oracle Database on a single computer. Additional installation guides for Oracle Real Application Clusters, Oracle Clusterware, Oracle Database Client, and Oracle Companion CD are available on the relevant installation media.

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 (x64)* to install Oracle Database using the default settings

Documentation Accessibility

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

accessible to all of our customers. For more information, visit the Oracle Accessibility Program Web site at

<http://www.oracle.com/accessibility/>

Accessibility of Code Examples in Documentation

Screen readers may not always correctly read the code examples in this document. The conventions for writing code require that closing braces should appear on an otherwise empty line; however, some screen readers may not always read a line of text that consists solely of a bracket or brace.

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TTY Access to Oracle Support Services

Oracle provides dedicated Text Telephone (TTY) access to Oracle Support Services within the United States of America 24 hours a day, seven days a week. For TTY support, call 800.446.2398.

Related Documentation

For more information, see these Oracle resources:

- *Oracle Database Release Notes for Microsoft Windows (x64)*
- *Oracle Database Client Installation Guide for Microsoft Windows (x64)*
- *Oracle Database Companion CD Installation Guide for Microsoft Windows (x64)*
- *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide*
- *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Administration and Deployment Guide*
- *Oracle Database Platform Guide for Microsoft Windows (x64)*
- *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 10g Release 2 (10.2) 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. Refer to *Oracle Database Sample Schemas* for information on how these schemas were created and how you can use them yourself.

Printed documentation is available for sale in the Oracle Store at

<http://oraclestore.oracle.com/>

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

<http://www.oracle.com/technology/membership/>

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

<http://www.oracle.com/technology/documentation/>

Conventions

The following text conventions are used in this document:

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

What's New in Oracle Database for Windows?

This chapter describes new and deprecated features of Oracle Database 10g release 2 (10.2) for Windows and provides pointers to additional information. It also retains new and deprecated features information from previous releases to help those users migrating to the current release.

The following sections describe the new features in Oracle Database:

- [Oracle Database 10g Release 2 \(10.2\) New Features for Windows](#)
- [Oracle Database 10g Release 2 \(10.2\) Deprecated Components](#)
- [Oracle Database 10g Release 1 \(10.1\) New Features for Windows](#)
- [Oracle Database 10g Release 1 \(10.1\) Deprecated Components](#)

See Also:

- *Oracle Database New Features* for the list of new features, options, and enhancements of Oracle Database
- The README file at the root level of the documentation media for more information about the Oracle Documentation Library

Oracle Database 10g Release 2 (10.2) New Features for Windows

This section contains this topic:

- [Oracle Cluster Ready Services \(CRS\) Name and Functionality Change](#)

Oracle Cluster Ready Services (CRS) Name and Functionality Change

Starting with this release, Oracle Cluster Ready Services (CRS) has the following changes:

- Its new name is Oracle Clusterware.
- You can install and use Oracle Clusterware without having to install Oracle Real Application Clusters. At least one server in the cluster must be licensed for Oracle Database 10g.

Oracle Database 10g Release 2 (10.2) Deprecated Components

The following Oracle Database 10g release 2 (10.2) components that were part of Oracle Database 10g release 1 (10.1) are not available for installation with Oracle Database 10g release 2 (10.2):

- Legato Single Server Version (LSSV)
Instead, use Oracle Database Recovery Manager (RMAN)
- Distributed Computing Environment (DCE) component of Oracle Advanced Security

Oracle Database 10g Release 1 (10.1) New Features for Windows

This section contains these topics:

- [Automatic Storage Management](#)
- [Database Password Encryption](#)
- [Data Pump Import and Data Pump Export](#)
- [Instant Client](#)
- [Large Page Support](#)
- [Oracle Enterprise Manager 10g Database Control](#)
- [Oracle Home Selector](#)
- [Oracle Provider for OLE DB](#)
- [Oracle Scheduler](#)
- [Oracle Services for Microsoft Transaction Server](#)
- [Renamed Components](#)

Automatic Storage Management

Automatic Storage Management enables creation of a single disk group from a collection of individual disk devices.

See Also: *Oracle Database Administrator's Guide* for more information about Automatic Storage Management

Database Password Encryption

When a user attempts a remote login to an Oracle Database 10g Release 2 (10.2) database, the password is automatically encrypted before it is sent to the remote database.

See Also: "Administering a Database on Windows" in *Oracle Database Platform Guide for Microsoft Windows (x64)*

Data Pump Import and Data Pump Export

Two new utilities, Data Pump Import and Data Pump Export, offer faster transfer of files to and from Oracle databases. The previous file transfer utilities, Import and Export, are retained for use with Oracle databases created with earlier versions of Oracle software.

See Also: "Database Tools on Windows" in *Oracle Database Platform Guide for Microsoft Windows (x64)*

Instant Client

The Instant Client feature of Oracle Call Interface (OCI) simplifies OCI installation. The activation of Instant Client mode is only dependent on the ability to load the Instant Client data shared library. It requires only two dynamic link libraries to be loaded by the dynamic loader of the operating system.

See Also:

- "OCI Instant Client" in *Oracle Call Interface Programmer's Guide*
- *Oracle Database Client Installation Guide for Microsoft Windows (x64)*

Large Page Support

Large page support provides a performance boost for memory-intensive database instances running on Windows Server 2003. By taking advantage of newly introduced operating system support, Oracle Database now can make more efficient use of processor memory addressing resources.

See Also: "Large Page Support for 64-Bit Windows" in *Oracle Database Platform Guide for Microsoft Windows (32-Bit)*

Oracle Enterprise Manager 10g Database Control

Oracle Enterprise Manager 10g Database Control is installed in the same Oracle home as the database and supports standalone Oracle Containers for Java (OC4J) instances.

See Also:

- ["Logging in to Enterprise Manager Database Control"](#) on page 5-2
- *Oracle Database 2 Day DBA* for details about Oracle Enterprise Manager 10g Database Control

Oracle Home Selector

Oracle Home Selector is no longer available from the **Start** menu. Instead, use Oracle Universal Installer, which has functionality similar to Oracle Home Selector.

Oracle Provider for OLE DB

Oracle Provider for OLE DB 10g Release 2 (10.2) includes the following new features:

- Support for Oracle grids
Oracle Provider for OLE DB is grid-enabled, allowing developers to take advantage of Oracle database grid support without having to make changes to their application code.
- Support for the following data types introduced with Oracle Database 10g release 2 (10.2):
 - BINARY_DOUBLE
 - BINARY_FLOAT
- Support for multiple Oracle homes
You can install Oracle Provider for OLE DB in multiple Oracle homes, starting with Oracle Database 10g Release 2 (10.2). However, being a COM component,

only one instance can be active on the computer. This means that the current (latest) installation renders the previous one inactive.

To make multiple homes available, some of the Oracle Provider for OLE DB files now include a version number, and the use of a `HOMEID` is required.

See Also: *Oracle Provider for OLE DB Developer's Guide*

Oracle Scheduler

This release includes a new database scheduler, Oracle Scheduler, to provide enterprise scheduling functionality. You can use the `OracleJobScheduler` service to start external jobs. This service is disabled by default. To use the external jobs functionality, the administrator must set the user name and password for the user account under which this service must run, and then enable the service.

See Also:

- "The Scheduler" in *Oracle Database New Features*
- "Overview of Scheduler Concepts" in *Oracle Database Administrator's Guide*
- "Using the Scheduler" in *Oracle Database Administrator's Guide*
- "Managing the Scheduler" in *Oracle Database Administrator's Guide*

Oracle Services for Microsoft Transaction Server

Oracle Services for Microsoft Transaction Server supports .NET transactional applications with Oracle Data Provider for .NET through the Oracle Provider for OLE DB, and ODBC.NET through the Oracle ODBC driver.

Renamed Components

The following components were renamed in this release:

Previous Name	New Name
Oracle Windows Performance Monitor	Oracle Counters for Windows Performance Monitor
Oracle Administration Assistant for Windows NT	Oracle Administration Assistant for Windows
Oracle Demos	Oracle Examples

Oracle Database 10g Release 1 (10.1) Deprecated Components

The following Oracle Database 10g Release 1 (10.1) components that were part of Oracle9i Release 2 (9.2.0) were not available for installation with Oracle Database 10g release 1 (10.1):

- INTYPE File Assistant (IFA)
- Migration Utility
- Oracle Names
- Oracle Trace (use SQL Trace and TKPROF in place of Oracle Traces)
- Pro*C GUI
- Pro*COBOL 1.8.77

Overview of Oracle Database Installation

This chapter describes the different installation types of Oracle Database for Microsoft Windows (x64) and issues to consider before you install Oracle Database:

- [Planning Your Installation](#)
- [Oracle Database Installation Types](#)
- [Oracle Database Installation Methods](#)
- [Installation Considerations](#)
- [Database Configuration Options](#)
- [Database Storage Options](#)
- [Database Management Options](#)
- [Database Backup and Recovery Options](#)
- [E-mail Notification Options](#)
- [Upgrade Considerations](#)

Planning Your Installation

The Oracle Database installation process consists of six steps:

1. **Read the release notes:** Read the Oracle Database 10g release 2 (10.2) 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/technology/documentation>

2. **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 refer to [Appendix A](#), 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 noninteractive installations using response files, and cloning the Oracle home.

3. **Complete preinstallation tasks:** [Chapter 2](#) describes tasks that you must complete before installing Oracle Database.
4. **Install the software:** Use the following sections to install Oracle Database:

- [Chapter 3](#) describes how to use Oracle Universal Installer (OUI) to install Oracle Database and Automatic Storage Management (ASM), as well as how to clone an Oracle home.
 - [Appendix C](#) describes how to perform silent or noninteractive installations using response files, which you may want to use if you need 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.
 - [Chapter 6](#) describes how to remove Oracle Database.
5. **Complete postinstallation tasks:** [Chapter 4](#) describes postinstallation tasks.
6. **Get started using Oracle Database:** Use the following sections to get started using Oracle Database:
- [Chapter 5](#) 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 3-18 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.

Oracle Database Installation Types

You can choose one of the following installation types when installing Oracle Database 10g:

- **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.
- **Standard Edition:** Installs an integrated set of management tools, full distribution, replication, Web features, and facilities for building business-critical applications.

Note: If you purchased a Standard Edition license, and you perform a Custom installation, ensure that you install only the components covered by the Standard Edition license.

- **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 Real Application Clusters is not installed with Personal Edition.

Note: Oracle9i Release 1 (9.0.1.1.1) was the terminal release for Personal Edition on Windows 98.

- **Custom:** Enables you to select the individual components that you want to install from the list of all available components.

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

See Also:

- *Oracle Database Client Installation Guide for Microsoft Windows (x64)* for Oracle Database Client installation instructions
- *Oracle Database Licensing Information* for more information about the features available with each Oracle Database edition and for information about licensing

Oracle Database Installation Methods

There are two methods that you can use to install Oracle Database:

- **Basic:** Select this installation method if you want to quickly install Oracle Database. This installation method requires minimal user input. It installs the software and optionally creates a general-purpose database using the information that you specify on this window. It is the default installation method.
- **Advanced:** Select this installation method if you want to complete any of the following tasks:

- Perform a custom software installation, in which you choose components individually, or choose a different database configuration

The Available Product Components installation window automatically selects the components most customers need in their Oracle Database installation. It also lists several components that are not selected by default, but which you may want to include. To find the listing of available components, select **Advanced**, and then in the Installation Type window, select **Custom**.

See Also: ["Reviewing Component-Specific Installation Guidelines"](#) on page 3-3

- Install Oracle Real Application Clusters
- Upgrade an existing database
- 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
- Configure Automatic Storage Management (ASM) for database storage
- Specify different passwords for administrative schemas
- Configure automated backups or Oracle Enterprise Manager notifications

Installation Considerations

This section provides information about Oracle Universal Installer and other concepts you should be aware of when you plan the installation.

- [Licensing Information](#)
- [Installation Differences Between Windows and UNIX Systems](#)
- [Oracle Cluster Synchronization Services](#)
- [Oracle Universal Installer Overview](#)
- [Oracle Base Directory](#)
- [Oracle Home Directory](#)
- [Multiple Oracle Home Support](#)

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*

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 and sets start-up and shutdown services at installation time. With UNIX systems, administrators are responsible for creating these services.
- 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.
- DBA account for database administrators
With Windows, Oracle Universal Installer creates the ORA_DBA group. In UNIX systems, you must create the DBA account manually.
- Account for running Oracle Universal Installer
With Windows, you log in with Administrator privileges. You do not need a separate account. With UNIX systems, you must create this account manually.

See Also: "Oracle Database Windows/UNIX Differences" appendix of *Oracle Database Platform Guide for Microsoft Windows (x64)*

Oracle Cluster Synchronization Services

The Oracle Cluster Synchronization Services (CSS) service synchronizes an Automatic Storage Management (ASM) instance and the database instances that rely on it for database file storage. By default, Oracle Universal Installer does not configure Oracle Cluster Synchronization Services; it only configures it if you select Automatic Storage Management as a storage or recovery option. Because Oracle Cluster Synchronization Services must be running before any Automatic Storage Management instance starts, Oracle Universal Installer configures it to start automatically when the system starts.

For Oracle Real Application Clusters installations, Oracle Universal Installer installs the CSS service with Oracle Clusterware in a separate Oracle home directory (also called the Oracle Clusterware home directory). For single-instance installations (not Oracle Real Application Clusters), you can install and run the CSS service from either a separate Oracle home for Automatic Storage Management, or from the same Oracle home as Oracle Database. For a single-instance Oracle Database installation, you can install Oracle Clusterware either before or after the database installation.

If you have installed Oracle Cluster Synchronization Services from the same Oracle home as Oracle Database, use caution when removing Oracle Database software from the system. Before you remove an Oracle home directory that contains Oracle Database, you must either delete the CSS service configuration, or if necessary, reconfigure the CSS service to run from another Oracle home directory.

Note: If you plan to have more than one Oracle Database installation on a single system and you want to use Automatic Storage Management for database file storage, Oracle recommends that you run the CSS service and the Automatic Storage Management instance from the same Oracle home directory and use different Oracle home directories for the database instances.

See Also:

- ["Automatic Storage Management"](#) on page 1-10
- ["Running Oracle Cluster Synchronization Services from a Different Oracle Home"](#) on page 4-3
- ["Removing Oracle Cluster Synchronization Services"](#) on page 6-1

Oracle Universal Installer Overview

Oracle Universal Installer is a Java-based graphical user interface (GUI) tool that enables you to install and remove 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 noninteractive installation of Oracle software using response files. See [Appendix C, "Installing and Configuring Oracle Database Using Response Files"](#) for more information.

You cannot use the earlier Oracle Installer (shipped with releases 7.n and 8.0.n) to install components into an Oracle Database 10g release 2 (10.2) Oracle home directory. Likewise, you cannot install Oracle Database 10g Release 2 (10.2) components into a release 7.n, 8.0.n, 8.1.3, 8.1.4, or 9.n Oracle home.

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 OracleMetaLink. Visit the following site to find Oracle patches to download:

<http://metalink.oracle.com/>

When Oracle Universal Installer runs, it creates an *OraHome_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 in on the same directory level as *ORACLE_BASE\ORACLE_HOME*.

See Also: Oracle Universal Installer and OPatch User's Guide

Oracle Universal Installer and OPatch User's Guide is included in your Oracle Documentation Library and is automatically installed on your hard drive during installation. To access this guide, from the **Start** menu, select **Programs**, then **Oracle - ORACLE_HOME**, then **Oracle Installation Products**, then **Universal Installer Concepts Guide**.

Oracle Base Directory

If you install Oracle Database 10g release 2 (10.2) on a computer with no other Oracle software installed, Oracle Universal Installer creates an Oracle base directory for you. If Oracle software is already installed, then one or more Oracle base directories already exist. In the latter case, Oracle Universal Installer offers you a choice of Oracle base directories into which to install Oracle Database. You should install this release of Oracle Database into the same release used to create the existing Oracle base directory.

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

```
SYSTEM_DRIVE:\> oracle\product\10.2.0
```

You are not required to create an Oracle base directory before installation, but you can do so if you want. You can set the *ORACLE_BASE* environment variable to point to this directory, which Oracle Universal Installer will recognize.

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

Oracle Home Directory

This section covers the following topics:

- [Contents of the Oracle Home Environment](#)
- [Multiple Oracle Home Components](#)
- [Multiple Oracle Home Support](#)

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 `db_1`, it appears in the Oracle base directory as follows:

```
SYSTEM_DRIVE:\> oracle\product\10.2.0\db_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 you specify along with their location during installation.

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. This means that the current (latest) installation renders the previous one inactive. These components are:

- Oracle Administration Assistant for Windows
- Oracle Counters for Windows Performance Monitor
- Oracle Provider for OLE DB

Note: All Oracle Database version 7 components and all Oracle Database release 8.0.3 components cannot have multiple Oracle homes.

Multiple Oracle Home Support

Oracle Database supports multiple Oracle homes. This means that you can install this release or previous releases of the software more than once on the same system, in different Oracle home directories.

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 10g Release 2 (10.2) software into an existing Oracle9i Oracle home directory. If you attempt to install this release into an Oracle home directory that contains software from an earlier Oracle release, the installation fails.

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

Database Configuration Options

During the installation, 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.

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.

Oracle Database Configuration Assistant Behavior During Database Installation

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

- Noninteractive mode

If you choose the Enterprise Edition, Standard Edition, or Personal Edition installation type, and then choose 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 as a background process, using the default settings for information not covered during the initial prompting session, 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

If you choose the custom installation type or the advanced database configuration option, Oracle Universal Installer does not prompt you for database information. Instead, it installs the software and then runs Oracle Database Configuration Assistant in interactive mode. Using the screens in Oracle Database Configuration Assistant, you can either modify one of the preconfigured database types or create a custom database and specify precisely how you want to configure it.

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

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

Database Storage Options

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

- [File System](#)
- [Automatic Storage Management](#)

File System

If you choose the file system option, 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, Oracle recommends that you follow the Optimal Flexible Architecture (OFA) recommendations described in [Appendix B](#) and distribute the database files over more than one disk.
- A file system on a logical volume manager (LVM) volume or a RAID device
 - If you are using multiple disks in an LVM or RAID configuration, Oracle recommends that you use the stripe-and-mirror-everything (SAME) methodology to increase performance and reliability. Using this methodology, you do not need to specify more than one file system mounting point for database storage.

If you choose the custom installation type or the advanced database creation option, you can also choose to 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.

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

Automatic Storage Management

Automatic Storage Management (ASM) is a high-performance storage management solution for Oracle database files that makes most manual I/O performance tuning tasks unnecessary. It simplifies the management of a dynamic database environment, such as creating and laying out databases and managing disk space.

Automatic Storage Management works well with single database installations, multiple database installations, and in Oracle Real Application Clusters (RAC) environments. It can be used with databases created in Oracle Database 10g Release 1 (10.1); conversely, Oracle Database 10g Release 2 (10.2) databases can use ASM from Oracle Database 10g Release 1 (10.1.0.3 and later). If your site has multiple single-instance databases, you can use Oracle Clusterware to consolidate multiple islands of databases into a single clustered pool of storage managed by Automatic Storage Management. ASM manages the storage of all database files, such as redo logs, control files, data pump export files, and so on. (However, it does not manage the Oracle Database executable binary files.)

In a nutshell, to use Automatic Storage Management, you allocate partitioned disks to Oracle with preferences for striping and mirroring. 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 Automatic Storage Management and the database instance is handled by Oracle Cluster Synchronization Services (CSS).

Automatic Storage Management Components

Automatic Storage Management uses the following components:

- [ASM Disk Groups](#)
- [ASM Instance](#)

ASM Disk Groups

A disk group is a set of disk devices that 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 a logical volume, or a partition on a physical disk. However, in most cases, disk groups consist of one or more individual physical disks. To enable Automatic Storage Management to balance I/O and storage appropriately within the disk group, make sure 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 ASM disk group templates. When you create a disk group, 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 Database Administrator's Guide* for more information.

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, Automatic Storage Management rebalances the 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, 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.

ASM Instance

The ASM instance is a special Oracle instance that manages ASM disk groups. This instance must be in its own Oracle home and running before you can start a database instance that uses Automatic Storage Management. When you choose Automatic Storage Management as your database storage mechanism, this instance is created and started, if necessary. For a single-instance Oracle Database installation, you only need one ASM instance, regardless of the number of database instances on the computer. The ASM instance on any given node in a single cluster can handle any combination of disk group types.

General Steps for Installing Automatic Storage Management

To install Automatic Storage Management, you use Oracle Universal Installer. The following are the general steps for installing Automatic Storage Management:

1. Determine disk requirements for your site and if necessary, create one or more disk partitions for Automatic Storage Management.

["Preparing Disk Groups for an Automatic Storage Management Installation"](#) on page 2-15 provides guidelines on how to determine disk requirements for your site.

2. Run Oracle Universal Installer to install and create an ASM instance and to create one or more ASM disk groups that the ASM instance will manage.

["Step 1: Reviewing Automatic Storage Management Installation Considerations"](#) on page 3-13 provides advice on where to install ASM and other installation considerations. ["Step 2: Creating the ASM Instance and ASM Disk Groups"](#) on page 3-13 describes how to create an ASM instance and disk groups.

After you have created an ASM instance and its associated disk groups, subsequent databases that you create will be able to use Automatic Storage Management for file storage management. If you have databases that were created before you installed ASM, you can migrate them to ASM by using the Enterprise Manager Migrate Database wizard. This wizard is available in Enterprise Manager Grid Control or Database Control. Alternatively, you can use Oracle Database Recovery Manager (RMAN) to perform the migration.

3. Create the databases that will use Automatic Storage Management.

["Step 3: Installing Oracle Database to Use with Automatic Storage Management"](#) on page 3-15 describes how to create a database for Automatic Storage Management.

4. Test the Automatic Storage Management installation.

["Step 4: Testing the Automatic Storage Management Installation"](#) on page 3-17 provides a simple test to check that the ASM installation was successful.

"[Managing Automatic Storage Management](#)" on page 5-4 explains how to start and access ASM and which Oracle database tools you can use to manage it.

See Also:

- "[Oracle Cluster Synchronization Services](#)" on page 1-5
- *Oracle Database 2 Day DBA* for a general overview, from a non-platform perspective, of Automatic Storage Management
- *Oracle Database New Features* for information on new features in this release of Automatic Storage Management
- *Oracle Database Administrator's Guide* for a more detailed description of Automatic Storage Management
- <http://www.oracle.com/technology/products/databases/asm> for additional information on Automatic Storage Management from Oracle Technology Network

Database Management Options

Oracle provides several utilities you can use to manage Oracle databases:

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

Oracle Enterprise Manager

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 that you want to manage. 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 10g Grid Control (or simply Grid Control).

Note: Oracle Enterprise Manager 10g is available separately on the Oracle Enterprise Manager Grid Control installation media.

- 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 except Custom. During a Custom installation, you can choose not to install Oracle Enterprise Manager Database Control. However, Oracle recommends that you install it. This local installation provides a

Web-based interface called Oracle Enterprise Manager Database Control. Database Control is similar in function to Grid Control, but it can manage only a single database. If you want to administer more than one database on this system, you must either configure a separate Database Control for each database, or install Oracle Enterprise Manager 10g Grid Control.

See Also: *Oracle Enterprise Manager 10g Concepts* and *Oracle Enterprise Manager 10g Installation and Basic Configuration* for more information about Oracle Enterprise Manager 10g

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

Management Options for Preconfigured Databases

When you create a preconfigured database during the installation, you must select the Oracle Enterprise Manager interface that you want to use 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 that you want to use 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.

Management Options for Custom Databases

If you choose the Advanced database configuration option or choose to create a database during a Custom installation, Oracle Universal Installer runs Oracle Database Configuration Assistant in interactive mode. Use Oracle Database Configuration Assistant to specify the Oracle Enterprise Manager interface that you want to use 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.

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](#)

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 flash recovery area. 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.

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

- The location of the flash recovery area
You can use either a file system directory or an Automatic Storage Management disk group for the flash recovery area. The default disk quota configured for the flash recovery area is 2 GB. For 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 flash 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_DEA` group).

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 flash 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 flash recovery area.

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 Basics* or *Oracle Database Backup and Recovery Advanced User's Guide* for more detailed information about defining a backup strategy and backing up and recovering Oracle databases
- *Oracle Secure Backup Installation Guide* if you plan to use Oracle Backup for your backup and recovery operations

E-mail 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.

Upgrade Considerations

Oracle recommends installing Oracle Database 10g release 2 (10.2) into a new Oracle home directory. If you must install Oracle Database 10g release 2 (10.2) 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. Upgrade procedures on Windows 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*.

See Also: [Chapter 6, "Removing Oracle Database Software"](#)

This section contains these topics:

- [Upgrading Databases that Use the AL24UTFFSS Character Set](#)
- [Policies for Linking and Relinking Applications](#)
- [Oracle Real Application Clusters Upgrade Requirements](#)
- [Downgrading a Database](#)

Upgrading Databases that Use the AL24UTFFSS Character Set

To upgrade an existing database that uses the AL24UTFFSS character set, upgrade the database character set to UTF8 before upgrading to Oracle Database 10g release 2 (10.2). Oracle recommends that you use the Character Set Scanner (`csscan`) utility for data analysis before attempting to upgrade your existing database character set. The Character Set Scanner utility checks all character data in the database and tests for the effects of, and problems with, changing the character set encoding.

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 3.1 and earlier; it does not support all valid XML characters. AL32UTF8 has no such limitation.

Using database character set UTF8 for XML data could potentially cause a fatal 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 will terminate parsing and raise an exception.

Policies for Linking and Relinking Applications

If you upgrade your Oracle database to 10g release 2 (10.2), then Oracle recommends that you upgrade the client software to Oracle Database 10g release 2 (10.2) 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.

See Also: *Oracle Database Upgrade Guide* for rules regarding linking and relinking applications when you perform a feature release upgrade of the client software

Oracle Real Application Clusters Upgrade Requirements

Oracle recommends that you upgrade Oracle Real Application Clusters to Oracle Database 10g release 2 (10.2).

See Also: *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for information regarding Oracle Real Applications Clusters upgrade requirements

Downgrading a Database

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

Oracle Database Preinstallation Requirements

This chapter describes the the following installation requirements for an x64-bit Windows installation of Oracle Database:

- [Oracle Database Hardware Requirements](#)
- [Oracle Database Software Requirements](#)
- [Oracle Database Hardware and Software Certification](#)
- [Oracle Database Network Topics](#)
- [Individual Component Requirements](#)

Oracle Database Hardware Requirements

This section describes hardware component and hard disk space requirements.

- [Hardware Component Requirements](#)
- [Hard Disk Space Requirements](#)
- [Verifying Hardware Requirements](#)

Hardware Component Requirements

The following hardware components are required for Oracle Database:

Table 2–1 *Hardware Requirements*

Requirement	Value
Physical memory (RAM)	512 MB minimum, 2 GB recommended
Virtual memory	Double the amount of RAM
Disk space	Total: 4.77 GB See Table 2–2 for details.
Video adapter	256 colors
Processor	AMD64, or Intel Extended memory (EM64T)

See Also:

- ["Configuring Disk Storage for Oracle Data Files and Recovery Files"](#) on page 2-12
- ["Creating Directories for Oracle Data Files or Recovery Files"](#) on page 2-13
- ["Preparing Disk Groups for an Automatic Storage Management Installation"](#) on page 2-15
- ["Installing with Minimum Memory Requirements"](#) on page 3-2

Hard Disk Space Requirements

This section lists system requirements for Windows platforms that use the NT File System (NTFS) file systems. Oracle recommends installing Oracle components on NTFS.

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 required 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 2–2](#) lists the space requirements for NTFS, including requirement for the starter database. The starter database requires 720 MB of disk space.

Table 2–2 *Disk Space Requirements for NTFS*

Installation Type	TEMP Space	SYSTEM_DRIVE:\Program Files\Oracle	Oracle Home	Data Files *	Total
Basic Installation	125 MB	100 MB	3.5 GB	1.05 GB	4.77 GB
Advanced Installation: Enterprise Edition	125 MB	100 MB	3.5 GB **	1.05 GB **	4.77 GB **
Advanced Installation: Standard Edition	125 MB	100 MB	3.5 GB **	1.05 GB **	4.77 GB **
Advanced Installation: Personal Edition	125 MB	100 MB	3.5 GB **	1.05 GB **	4.77 GB **

* Refers to the contents of the `admin`, `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 (x64)*

Verifying Hardware Requirements

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

1. Determine the physical RAM size. For a computer using Windows 2003, for example, double-click **System** in the Windows Control Panel and click the **General** tab. 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 a computer using Windows 2003, for example, double-click **System** in the Control Panel, click the **Advanced** tab, and click **Settings** in the **Performance** section. Then click the **Advanced** tab. 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 a computer using Windows 2003, for example, double-click **My Computer**, right-click the drive where the Oracle software is to be installed, and select **Properties**.
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 will be needed for the Oracle software to be installed.

If there is less than 125 MB of disk space available in the `temp` directory, then first 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. For a computer using Windows 2003, for example, double-click **System** in the Control Panel, click the **Advanced** tab, and click **Environment Variables**.

Oracle Database Software Requirements

Table 2–3 lists the software requirements for Oracle Database.

Table 2–3 Software Requirements

Requirement	Value
System Architecture	<p>Processor: AMD64, or Intel Extended memory (EM64T)</p> <p>Note: Oracle provides 32-bit (x86), 64-bit (Itanium), and 64-bit (x64) versions of Oracle Database for Microsoft Windows. The 64-bit (x64) database version, which this installation guide describes, runs on the 64-bit version of Windows on AMD64 and EM64T hardware. Oracle provides limited certification for 32-bit Oracle Database on 64-bit Windows (x64). For additional information, visit <i>OracleMetaLink</i> at:</p> <p>http://metalink.oracle.com</p>
Operating System	<p>Oracle Database for x64 Windows is supported on the following operating systems:</p> <ul style="list-style-type: none"> ■ Windows Server 2003, Standard x64 Edition ■ Windows Server 2003, Enterprise x64 Edition ■ Windows Server 2003, Datacenter x64 Edition ■ Windows XP Professional x64 Edition <p>Windows Multilingual User Interface Pack is supported on Windows Server 2003 and Windows XP Professional.</p>

Table 2–3 (Cont.) Software Requirements

Requirement	Value
Compiler	<p>The following components are supported with the Windows 2003 Microsoft Platform SDK or later compiler and Intel compiler 8.1:</p> <ul style="list-style-type: none"> ■ Oracle C++ Call Interface ■ Oracle Call Interface ■ External callouts ■ PL/SQL native compilation ■ Pro*C ■ XDK <p>GNU Compiler Collection (GCC), Object Oriented COBOL (OOCOBOL) specifications, and Pro*COBOL are not supported.</p>
Network Protocol	<p>The Oracle Net foundation layer uses Oracle protocol support to communicate with the following industry-standard network protocols:</p> <ul style="list-style-type: none"> ■ TCP/IP ■ TCP/IP with SSL ■ Named Pipes
Oracle Database Client	<p>If you plan to connect to Oracle Database 10g release 2 (10.2) from a release of Oracle Database Client that is earlier than 10g release 2 (10.2), you will not be able to do so if the following conditions exist:</p> <ul style="list-style-type: none"> ■ Oracle Database Client is running on the same computer as Oracle Database 10g release 2 (10.2). ■ Microsoft Windows Terminal Services is not running on the same computer as Oracle Database Client. Typically, Terminal Services is installed and configured with Microsoft Windows 2003, but on Windows XP it may not be installed or enabled. ■ Oracle Database Client is version 8.0, 9.0–9.2.0.6, or 10.1–10.1.0.3. ■ Oracle Database Client is not running as Administrator. <p>To remedy this problem, upgrade Oracle Database Client by using the latest Oracle Database Family patchset (9.2.0.7, or 10.1.0.4 or later). You can download the patchset from the Patches and Updates section of <i>OracleMetaLink</i> at:</p> <p>http://metalink.oracle.com</p>

See Also:

- ["Windows Support"](#) on page 2-6
- ["Windows Telnet Services Support"](#) on page 2-5
- ["Windows Terminal Services and Remote Desktop Support"](#) on page 2-5
- x64 software and documentation on Oracle Technology Network
<http://www.oracle.com/technology/documentation/>

Oracle Database 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 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 Oracle*MetaLink* Web site is available at:

<http://metalink.oracle.com/>

You must register online before using Oracle*MetaLink*. After logging in, click **Certify & Availability** from the left-hand column. From the Product Lifecycle page, click the **Certifications** button. Other Product Lifecycle options include **Product Availability**, **Desupport Notices**, and **Alerts**.

The following sections provide certification information:

- [Windows Telnet Services Support](#)
- [Windows Terminal Services and Remote Desktop Support](#)
- [Windows Support](#)
- [Web Browser Support](#)

Windows Telnet Services Support

Windows 2003 and Windows XP include a Telnet Service that allows remote users to log on to the operating system and run console programs using the command line, in the same way that they do on UNIX. Oracle supports the use of command line utilities, such as SQL*Plus, Export, Import, and SQL*Loader, using this feature, but does not support their GUI tools.

Note: Ensure that the Telnet service is started on the Windows **Services** utility.

Windows Terminal Services and Remote Desktop Support

Oracle supports installing, configuring, and running Oracle Database through Terminal Services on Windows 2003 and Windows XP. If you encounter problems with the installation through Terminal Server, Oracle recommends that you try connecting to the Terminal Services console session of the server (using mstsc/console).

You can configure Windows 2003 to use Terminal Services in Remote Desktop for Administration Mode or Terminal Server Mode. For Windows XP, the Remote Desktop is only available in Single User Mode.

See Also:

- The Microsoft Web site for more information about terminal services

<http://www.microsoft.com/>

- The Oracle*MetaLink* Web site for the latest Terminal Server certification information

<http://metalink.oracle.com/>

Windows Support

The following components are not supported on Windows XP:

- DCE Adapter Support
- Entrust PKI Support
- Generic Connectivity
- Oracle Messaging Gateway
- Oracle Real Application Clusters, including Cluster File System and Server Management
- Oracle Clusterware
- nCipher Accelerator Support

The following components are not supported on Windows 2003:

- DCE Adapter
- Oracle Fail Safe
- GNU Compiler Collection (GCC)
- Oracle Database Extensions for .NET
- Oracle Procedural Gateway
- Oracle Transparent Gateway
- Oracle HTML DB
- Oracle Workflow
- Oracle HTTP Server
- Business Components for Java (BC4J)
- CyberSafe Adapter Support
- Entrust PKI Support
- Generic Connectivity
- Java Server Pages
- nCipher Accelerator Support
- Oracle Data Provider for .NET
- Oracle Enterprise Manager Grid Control CD

A 64-bit Windows version of Oracle Enterprise Manager Grid Control is not available in this release.

- Oracle Enterprise Manager Java Console
- Oracle Messaging Gateway
- Oracle Migration Workbench

You can execute Oracle Migration Workbench from a 32-bit Windows environment to migrate third-party databases, as supported by release 9.2.0.2.1 or later, to an Oracle Database 10g Release 2 (10.2) database installed on a 64-bit Windows computer.

- Oracle Objects for OLE
- Oracle Workflow Builder

- Pro*COBOL
- Oracle Database Extensions for .NET
- Oracle Enterprise Integration Gateways, which include the following:
 - Oracle Procedural Gateway for APPC
 - Oracle Transparent Gateway for IBM DRDA
- Oracle Open Gateways, which include the following:
 - Oracle Transparent Gateway for Sybase
 - Oracle Transparent Gateway for Teradata
 - Oracle Transparent Gateway for Microsoft SQL Server
- Database Upgrade Assistant

Web Browser Support

Microsoft Internet Explorer 6.0 or later Web browser is supported.

Oracle Database Network Topics

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 DHCP Computers](#)
- [Installing Oracle Database on Computers with Multiple IP Addresses](#)
- [Installing Oracle Database on Computers with Multiple Aliases](#)
- [Installing Oracle Database on Non-Networked Computers](#)
- [Installing a Loopback Adapter](#)

Installing Oracle Database on DHCP Computers

Dynamic Host Configuration Protocol (DHCP) assigns dynamic IP addresses on a network. Dynamic addressing allows a computer to have a different IP address each time it connects to the network. In some cases, the IP address can change while the computer is still connected. You can have a mixture of static and dynamic IP addressing in a DHCP system.

In a DHCP setup, the software tracks IP addresses, which simplifies network administration. This lets you add a new computer to the network without having to manually assign that computer a unique IP address. However, before installing Oracle Database onto a computer that uses the DHCP protocol, you need to install a loopback adapter to assign a local IP address to that computer.

See Also: ["Checking if a Loopback Adapter Is Installed on Your Computer"](#) on page 2-10

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. If `ORACLE_HOSTNAME` is not set and you are installing on a computer that has multiple network cards, Oracle Universal Installer determines the host name by using the first name in the `hosts` file, typically located in `SYSTEM_DRIVE:\WINDOWS\system32\drivers\etc` on Windows 2003 and Windows XP.

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 that you want 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**.

Installing Oracle Database on Computers with Multiple Aliases

A computer with multiple aliases is registered with the naming service under a single IP 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.

Installing Oracle Database on Non-Networked 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 and host name.

See Also: ["Installing a Loopback Adapter"](#) on page 2-9

2. Ping the computer from itself, using only the host name and using the fully qualified name, which should be in the `etc\host` file.

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

```
SYSTEM_DRIVE\> ping mycomputer                Ping itself using just the
hostname.
Reply from 10.10.10.10                          Returns local IP.
SYSTEM_DRIVE:\> 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.

Installing a Loopback Adapter

When you install a loopback adapter, the loopback adapter assigns a local IP address for your computer. After you install a loopback adapter on your computer, you have at least two network adapters on your computer: your own network adapter and the loopback adapter. Oracle Database needs to have Windows using the loopback adapter as the primary adapter.

The primary adapter is determined by the order in which you installed the adapters: it is the *last* adapter installed. If you install additional network adapters after you install the loopback adapter, you need to deinstall the loopback adapter and reinstall it.

A loopback adapter is required if:

- You are installing on a DHCP computer, or

See Also: ["Installing Oracle Database on DHCP Computers"](#) on page 2-7

- 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 Non-Networked Computers"](#) on page 2-8

This section covers the following topics:

- [Checking if a Loopback Adapter Is Installed on Your Computer](#)
- [Installing a Loopback Adapter on Windows 2003 or Windows XP](#)
- [Removing a Loopback Adapter](#)

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:

```
SYSTEM_DRIVE:\> ipconfig /all
```

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. . . . . : Yes  
  Autoconfiguration Enabled . . . . : Yes  
  Autoconfiguration IP Address. . . : 169.254.25.129  
  Subnet Mask . . . . . : 255.255.0.0
```

Installing a Loopback Adapter on Windows 2003 or Windows XP

To install a loopback adapter on Windows 2003 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 hardware types, select the type of hardware you are installing window, 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.
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 will need later in this procedure.
 - d. Leave all other fields empty.
 - e. Click **OK**.
17. Click **OK**.
 18. Close **Network Connections**.
 19. Restart the computer.
 20. Add a line to the `SYSTEM_DRIVE:\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:
 - a. Open **System** in the Control Panel, and select the **Computer Name** tab. In **Full computer name**, make sure you see the host name and the domain name, for example, `sales.us.mycompany.com`.
 - b. Click **Change**. In **Computer name**, you should see the hostname, 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.mycompany.com`.
 - c. Click **More**. In **Primary DNS suffix of this computer**, you should see the domain name, for example, `us.mycompany.com`.

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**.
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**.

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](#)
- [Preparing Disk Groups for an Automatic Storage Management Installation](#)
- [Oracle Advanced Security Requirements](#)
- [Oracle-Managed Files Requirements](#)
- [Oracle Real Application Clusters](#)

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 that you want 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 type of file.

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
- Automatic Storage Management

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 flash recovery area):

- File system
- 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.

Configuring Disk Storage

For more information about these options, see the "[Database Storage Options](#)" section on page 1-9. 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 2-13.
- To use Automatic Storage Management for database or recovery file storage, see the "[Preparing Disk Groups for an Automatic Storage Management Installation](#)" section on page 2-15.

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](#)

Guidelines for Placing Oracle Data Files on a File System

- You can choose either a single file system or more than one file system to store the data files:
 - If you want to use a single file system, 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 more than one physical device and implement the stripe and mirror everything (SAME) methodology.
 - If you want to use more than one file system, 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. It also enables full implementation of the Optimal Flexible Architecture guidelines described in [Appendix B, "Optimal Flexible Architecture"](#). You must choose either the Advanced database creation option or the Custom installation type during the installation to implement this method.
- If you intend to create a preconfigured database during the installation, 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.

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 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 flash recovery area (specified by the `DB_RECOVERY_FILE_DEST_SIZE` initialization parameter).

If you choose the Custom installation type or 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 Database Control to specify a different value.

See Also: *Oracle Backup and Recovery Basics* for more information about the flash 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.

Creating Required Directories

Note: You must complete this procedure only if you want 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 that you want to use:

File Type	File System Requirements
Data files	Choose either: <ul style="list-style-type: none"> ■ 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 more than one type of file, 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 Automatic Storage Management, refer to "[Preparing Disk Groups for an Automatic Storage Management Installation](#)" on page 2-15 for instructions. Otherwise see the "[Stopping Existing Oracle Services](#)" section on page 2-22.

Preparing Disk Groups for an Automatic Storage Management Installation

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

This section covers the following topics:

- [General Steps for Preparing Disk Groups for an ASM Installation](#)
- [Step 1: Identifying Storage Requirements for Automatic Storage Management](#)
- [Step 2 \(Optional\): Using an Existing Automatic Storage Management Disk Group](#)
- [Step 3: Creating DAS or SAN Disk Partitions for an ASM Instance](#)
- [Step 4: Manually Configuring Disks for Automatic Storage Management](#)

General Steps for Preparing Disk Groups for an ASM Installation

You will follow these general steps to configure Automatic Storage Management:

1. Identify your site's storage requirements.
2. Optionally, use an existing Automatic Storage Management disk group.
3. If you are creating a new Automatic Storage Management disk group, create partitions for direct attached storage (DAS) or storage area network (SAN) disks.
4. Use one of the following methods to complete the Automatic Storage Management configuration:
 - If you plan to install Oracle Database using interactive mode, Oracle Universal Installer prompts you for the Automatic Storage Management disk configuration information during the installation.
 - If you plan to install Oracle Database using silent or noninteractive mode, you will need to manually configure the disks before performing the installation.

Step 1: Identifying Storage Requirements for Automatic Storage Management

To identify the storage requirements for using 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 Automatic Storage Management for Oracle data files, recovery files, or both.

Note: You do not have to use the same storage mechanism for data file and recovery files. One storage mechanism can use the file system while the other uses Automatic Storage Management. If you plan to use Automatic Storage Management for both data files and recovery files, you should create separate ASM disk groups for the data files and the recovery files.

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

- If you select an installation method that runs Oracle Database Configuration Assistant in interactive mode, by choosing the Advanced database

configuration option for example, then you can decide whether you want to use the same ASM disk group for data files and recovery files, or you can choose to use different disk groups for each file type. Ideally, you should create separate ASM disk groups for data files and recovery files.

The same choice is available to you if you use Oracle Database Configuration Assistant after the installation to create a database.

- If you select an installation type that runs Oracle Database Configuration Assistant in noninteractive mode, then you must use the same ASM disk group for data files and recovery files.
2. Decide on the Automatic Storage Management redundancy level that you want to use for each Automatic Storage Management disk group you will create.

The redundancy level that you choose for the Automatic Storage Management disk group determines how ASM 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 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

In a normal redundancy disk group, by default Automatic Storage Management uses two-way mirroring for data files and three-way mirroring for control files, to increase performance and reliability. 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, 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	1.15 GB	2.3 GB	3.45 GB
Normal	2	2.3 GB	4.6 GB	6.9 GB
High	3	3.45 GB	6.9 GB	10.35 GB

If an ASM instance is already 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 installation.

The following step describes how to identify existing disk groups and determine the free disk space that they contain.

- Optionally identify failure groups for the ASM disk group devices.

Note: You need to complete this step only if you intend to use an installation method that runs Oracle Database Configuration Assistant in interactive mode, for example, if you intend to choose the Custom installation type or 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.

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.

- 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 ASM disk group should be the same size and have the same performance characteristics.
 - Do not specify more than one partition on a single physical disk as a disk group device. 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 Automatic Storage Management disk group, Oracle does not recommend their use. Logical volume managers can hide the physical disk architecture, preventing Automatic Storage Management from optimizing I/O across the physical devices.

See Also: ["Step 4: Manually Configuring Disks for Automatic Storage Management"](#) on page 2-20 for information about completing this task

Step 2 (Optional): Using an Existing Automatic Storage Management Disk Group

If you want to use Automatic Storage Management as the storage option for either database or recovery files, and an existing Automatic Storage Management disk group exists, you have the following choices, depending on the installation method that you select:

- If you select an installation method that runs Oracle Database Configuration Assistant in interactive mode, by choosing the Advanced database configuration option for example, you can decide whether you want to create a new disk group or use an existing one.

The same choice is available to you if you use Oracle Database Configuration Assistant after the installation to create a database.

- If you select an installation type that runs Oracle Database Configuration Assistant in noninteractive mode, you must choose an existing disk group for the new database. You cannot create a new disk group. However, you can add disk devices to an existing disk group if it has insufficient free space for your requirements.

Note: The Automatic Storage Management instance that manages the existing disk group can be running in a different Oracle home directory.

To determine whether an existing ASM disk group exists, or to determine whether there is sufficient disk space in a disk group, you can use Oracle Enterprise Manager Database Control. Alternatively, you can use the following procedure:

1. In the **Services** Control Panel, make sure that the `OracleASMServ+ASM` service has started.
2. Open a Windows command prompt and temporarily set the `ORACLE_SID` environment variable to specify the appropriate value for the ASM instance that you want to use.

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

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

3. Connect to the ASM instance as the `SYS` user with the `SYSDBA` privilege and start the instance if necessary:

```
SYSTEM_DRIVE:\> sqlplus sys/SYS_password as sysdba
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, Oracle recommends that you use devices that have the same size and performance characteristics as the existing devices in that disk group.

Step 3: Creating DAS or SAN Disk Partitions for an ASM Instance

In order to use a DAS or SAN disk in 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 Automatic Storage Management, as long as it is partitioned. You cannot use NAS or Microsoft dynamic disks, however.

This section covers the following topics.

- [Step 1: Enabling Disk Automounting for Windows Server 2003](#)
- [Step 2: Creating the Disk Partitions](#)

Step 1: Enabling Disk Automounting for Windows Server 2003

Before you can configure partitions or logical drives on Windows Server 2003, you must enable disk automounting. Enable disk automounting when using:

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

To enable automounting:

1. Enter the following commands at a command prompt:

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

`diskpart.exe` is included with the Windows 2003 and Windows XP operating systems.

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:

```
SYSTEM_DRIVE:\> 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.

For example, 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 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
```

Step 4: Manually Configuring Disks for Automatic Storage Management

To use Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN) storage, the disks must be stamped with a header. If you install Oracle Database in interactive mode, Oracle Universal Installer configures the disks' headers during the installation process. However, if you plan to install Oracle Database in noninteractive mode, you need to 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 Automatic Storage Management on unpartitioned disks.

The `asmtoolg` and `asmtool` tools associate meaningful, persistent names with disks to facilitate using those disks with Automatic Storage Management. 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. You can use them as raw devices in the Automatic Storage

Management instance by specifying a name `\\.\ORCLDISKprefixn` where *prefix* can be either `DATA` or a value you supply, and *n* represents the disk number.

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 Automatic Storage Management.

To add or change disk stamps:

1. In the installation media labeled Oracle Database 10g Release 1 (10.1), navigate to `database\asmtool` and double-click `asmtoolg`.

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

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

The `asmtoolg` tool will show the devices available on the system. Unrecognized disks are labeled as "Candidate device", raw device files as "Oracle raw device file", stamped Automatic Storage Management disks as "Stamped ASM disk", and unstamped 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 ASM disks.

If necessary, follow the steps under ["Step 3: Creating DAS or SAN Disk Partitions for an ASM Instance"](#) on page 2-19 to create a disk partition for the ASM instance.

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

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 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 (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 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. It has the following options:

Option	Description	Example
-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 Automatic Storage Management stamp, then you must specify the <code>-force</code> option. Also sets ASM instances to rescan the available disks. If you need to partition a disk, follow the procedures under " Step 3: Creating DAS or SAN Disk Partitions for an ASM Instance " on page 2-19.	<code>asmtool -add [-force]</code> <code>\Device\Harddisk1\Partition1 ORCLDISKASM0</code> <code>\Device\Harddisk2\Partition1 ORCLDISKASM2...</code>
-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 Automatic Storage Management stamp, then you must specify the <code>-force</code> option. Also sets ASM instances to rescan the available disks	<code>asmtool -addprefix ORCLDISKASM [-force]</code> <code>\Device\Harddisk1\Partition1</code> <code>\Device\Harddisk2\Partition1...</code>
-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 ASM stamp, then you must specify the <code>-force</code> option.	<code>asmtool -list [-force]</code>
-delete	Removes existing stamps from disks. Also sets ASM instances to rescan the available disks	<code>asmtool -delete ORCLDISKASM0 ORCLDISKASM1...</code>

Stopping Existing Oracle Services

Note: If you are installing additional Oracle Database components in an existing Oracle home, stop all processes running in the Oracle home. You must complete this task to enable Oracle Universal Installer to relink certain executables and libraries.

If you choose to create a database during the installation, 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 can only configure the new listener; it cannot start it. To ensure that the new listener process starts during the installation, you must shut down any existing listeners before starting Oracle Universal Installer.

See Also: "[Stopping Oracle Services](#)" on page 6-2

Oracle Advanced Security Requirements

Satisfy hardware and software requirements so that you can use authentication support with Oracle components. Some Oracle Advanced Security components can use a Lightweight Directory Access Protocol (LDAP) directory such as Oracle Internet Directory.

See Also: *Oracle Database Advanced Security Administrator's Guide*

Oracle-Managed Files Requirements

If you choose the Custom installation type or 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*

Oracle Real Application Clusters

If you plan to install Oracle Real Application Clusters, you must first install Oracle Clusterware.

See Also: *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for your platform, available on the Oracle Clusterware installation media

Installing Oracle Database

This chapter covers the following topics:

- [Preinstallation Considerations for Installing Oracle Database](#)
- [Reviewing Component-Specific Installation Guidelines](#)
- [Accessing the Installation Software](#)
- [Installing the Oracle Database Software](#)
- [Installing Automatic Storage Management](#)
- [Cloning an Oracle Home](#)

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 noninteractive mode.

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

Next, consider the following issues:

- [Performing Multiple Oracle Database Installations](#)
- [Installing onto Systems That Already Have Oracle Components](#)
- [Installing with Minimum Memory Requirements](#)

Performing Multiple Oracle Database Installations

If you need to perform multiple installations of Oracle Database, 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 noninteractive mode and you supply a response file to provide information Oracle Universal Installer will need. 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 3-18

Installing onto Systems That Already Have Oracle Components

See Also:

- ["Upgrade Considerations"](#) on page 1-15 before running Oracle Universal Installer
- "Pre-Installation Tasks for Installing Oracle Real Applications Clusters on Windows-Based Systems" in *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* 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 need to upgrade. Review ["Upgrade Considerations"](#) on page 1-15.
4. If you are installing in an existing Oracle Database 10g release 2 (10.2) home, stop all Oracle services.

If any Oracle services (their names begin with Ora) exist and have the status *Started*, then stop them. In particular, ensure that all Oracle listener services are stopped.

See Also: Your Microsoft online help for more information about stopping services

Installing with Minimum Memory Requirements

Installations of Oracle Database on computers with 1 GB or RAM and 2 GB of virtual memory have the following limitations:

- Computers with 256 MB of memory 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 are running on the computer, you may need to 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.

Do not install the database on computer systems that barely meet the minimum memory and virtual memory requirements, 256 MB and 512 MB respectively. Depending on the installation type you choose, follow these guidelines:

- Select **Basic Installation** and deselect **Create Starter Database**.
- Select **Advanced Installation**, select **Do not create a starter database** from the Select Database Configuration window.
- Select **Advanced Installation**, select the **Custom** installation type from the Select Installation Type window, and select **No** on the Create Database window when prompted to create the database.
- Cancel Oracle Database Configuration Assistant from the Configuration Assistants window.

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 **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 **Programs**, then **Oracle - HOME_NAME**, then **Configuration and Migration Tools**, then **Database Upgrade Assistant**.

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.

- Installations on a cluster

If Oracle Clusterware or Oracle Real Application Clusters is already installed on the system, Oracle Universal Installer displays the Specify Hardware Cluster Installation Mode window. You must select **Local Installation** on this window, unless you want to install Oracle Real Application Clusters.

See Also: *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for your platform, available on the Oracle Clusterware installation media

- Products not installed by default: select **Advanced Installation** and then the **Custom** installation type. These products are:

- Oracle Connection Manager
- Oracle Label Security

To configure Oracle Label Security to use Oracle Internet Directory, choose the Oracle Internet Directory option when running Oracle Database Configuration Assistant. If you are installing Oracle Label Security in an existing Oracle home, then shut down each database in the Oracle home.

- Oracle COM Automation feature

- Data Mining Scoring Engine
- Oracle Windows Interfaces
- Oracle Counters for Windows Performance Monitor
- Reinstalling Oracle software

If you reinstall Oracle software into an Oracle home directory where Oracle Database is already installed, you must also reinstall any components, such as Oracle Partitioning, that were installed before you began the reinstallation.

Accessing the Installation Software

The Oracle Database software is available on installation media, or you can download it from the Oracle Technology Network (OTN) Web site. You can access and install Oracle Database by using the following scenarios:

- [Installing from a Remote DVD Drive](#)
- [Installing on Remote Computers Through Remote Access Software](#)
- [Downloading Oracle Software from the Oracle Technology Network Web Site](#)
- [Copying the Oracle Database Software to a Hard Disk](#)

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 will need to complete the following steps:

- [Step 1: On the Remote Computer, Share the DVD Drive](#)
- [Step 2: On the Local Computer, Map the DVD Drive](#)

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

The remote DVD drive that you want to use 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 will use this name when you map the DVD drive on the local computer. Under "[Step 2: On the Local Computer, Map the DVD Drive](#)" on page 3-5 see Step d under Step 1.
 - c. Click **Permissions**. You need at least read permission for the user who will be accessing the drive to install Oracle Database.
 - d. Click **OK** when you are finished.
5. Insert the Oracle Database installation media into the DVD drive.

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 need to 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 3-7.

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 will run 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.

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. Make sure 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 3-7.

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. Make sure that the remote access software is installed and running on the remote and local computers.

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 3-4.
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 3-4.
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 3-7.

Downloading Oracle Software from the Oracle Technology Network Web Site

You can download the installation files from the Oracle Technology Network (OTN) and extract them on your hard disk.

To download the installation files:

1. Use a browser to access the Oracle Technology Network software download page:
<http://www.oracle.com/technology/software/>
2. Navigate to each of the download pages for the product that you want to install.
3. On each 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 files. In most cases, the available disk space must be at least twice the size of each compressed file.
5. On the file system that you just selected, create a parent directory for each product you plan to install, for example `OraDB10g`, to hold the installation directories.
6. Download all of the installation files to the directories that you just created.
7. Verify that the files you downloaded are the same size as the corresponding files 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 the "[Installing the Oracle Database Software](#)" section on page 3-7.

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:\> 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 3-7.

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:

- ["Installing Automatic Storage Management"](#) on page 3-12 if you want to install Oracle Database and use Automatic Storage Management
- [Appendix C, "Installing and Configuring Oracle Database Using Response Files"](#) if you want to install Oracle Database using response files and silent or noninteractive mode, without the GUI. It also explains how to clone an existing Oracle home. These methods are useful if you need to perform multiple installations of Oracle Database.

To install the Oracle Database software:

1. Log on as a member of the Administrators group to the computer on which 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 multiple homes 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 2-8
- ["Installing Oracle Database on Computers with Multiple IP Addresses"](#) on page 2-8
- ["Installing Oracle Database on Computers with Multiple Aliases"](#) on page 2-8

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 platforms.

4. Double-click `setup.exe` to start Oracle Universal Installer.
5. In the Welcome window, select either **Basic Installation** or **Advanced Installation**, and then answer the prompts as needed.

See Also: "[Oracle Database Installation Methods](#)" on page 1-3 for more information on the **Basic** and **Advanced** installation methods

The subsequent windows that appear, which are listed in [Table 3-1](#) on page 3-10, depend on the installation method you have chosen. The order in which the windows appear depends on the options you select.

6. Follow these guidelines to complete the installation:
 - Do not install Oracle Database 10g Release 2 (10.2) software into an existing Oracle home that contains Oracle9i or earlier software.
 - If you install Oracle Database 10g Release 2 (10.2) in an Oracle home directory that already contains Oracle Database 10g Release 2 (10.2) client software, the listener is not created. To create the listener, install and run Oracle Net Configuration Assistant after the installation. If the Administrator client is installed before Oracle Database, Oracle Net Configuration Assistant is already installed.
 - Follow the instructions displayed in the Oracle Universal Installer windows. If you need additional information, click **Help**.
 - When prompted for a password, follow these guidelines:
 - Make the password be between 4 and 30 characters long.
 - Use the database character set for the password's characters, which can include the underscore (`_`), dollar (`$`), and pound sign (`#`) characters.
 - Do not start passwords with a numeral.
 - Do not use a user name for a password.
 - Do not use Oracle reserved words for the password.
 - Do not use `change_on_install` for the SYS account password.
 - Do not use `manager` for the SYSTEM account password.
 - Do not use `sysman` for the SYSMAN account password.
 - Do not use `dbsnmp` for the DBSNMP account password.
 - If you choose to use the same password for all the accounts, do not use `change_on_install`, `manager`, `sysman`, or `dbsnmp` as a password.
 - Have the password include at least 1 alphabetic, 1 numeric, and 1 punctuation mark character
 - Do not use simple or obvious words, such as `welcome`, `account`, `database`, and `user` for the password.

Note: You must remember the passwords that you specify.

- 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 and Oracle Net Configuration Assistant in interactive mode, you must provide detailed information about configuring your database and network.

If you need assistance when using the Oracle Database Configuration Assistant or Oracle Net Configuration Assistant in interactive mode, click **Help** on any window.

Note: If you chose a default installation, Oracle Database Configuration Assistant and Oracle Net Configuration Assistant do not run interactively.

7. When the configuration tools finish, click **Exit**, then click **Yes** to exit from Oracle Universal Installer.
8. When Oracle Enterprise Manager Database Control opens a Web browser, enter the user name and password you created during the installation.

You can log in as `SYS`, `SYSTEM`, or `SYSMAN`. If you log in as `SYS`, then you must connect as `SYSDBA`. Enter the password you specified for the account during installation.
9. Optionally, delete the `OraInstalldate_time` directory if you want 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.
10. See [Chapter 4, "Oracle Database Postinstallation Tasks"](#) for information about tasks that you must complete after you have installed Oracle Database.

Table 3–1 Oracle Universal Installer Windows

Window	Recommended Action
Select Installation Method	Select one of the following, then click Next : <ul style="list-style-type: none"> ▪ Basic Installation: 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 window. ▪ Advanced Installation: Lets you 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 Installation Type	Select Enterprise Edition , Standard Edition , Personal Edition , or Custom . Click Next .
Specify Home Details	In the Destination section, accept the default values or enter the Oracle home name and directory path in which to install Oracle components. The directory path should not contain spaces. Click Next .
Available Product Components	If you selected Custom for the Installation Type, this window appears. Select from the list and click Next . To learn more about each component, position the mouse over the component name.
Product-specific Prerequisite Checks	This window checks that your system meets the minimum requirements for the installation. Click Next .
Upgrade an Existing Database	If you have a previous updatable version of Oracle Database or Automatic Storage Management (ASM) installed, this window appears. For in-place database installations where Automatic Storage Management is running, ASM is upgraded automatically. Click Yes if you want to upgrade or No if not. If you click Yes , the Summary window appears next. For more information about upgrades, see <i>Oracle Database Upgrade Guide</i> .
Select Configuration Option	Select one of the following: <ul style="list-style-type: none"> ▪ Create a database: Select this option if you are creating a database using the following types: General purpose, Transaction processing, and Data warehousing. The Advanced option lets you perform a custom installation. ▪ Configure Automatic Storage Management (ASM): Select this option to create an Automatic Storage Management instance only. To create an ASM instance, you must provide an ASM SYS Password. After you provide this password, Oracle Universal Installer lets you create an ASM disk group. After you complete this Oracle Universal Installer session, you can run it again to install and configure one or more Oracle databases that will use ASM. ▪ Install database Software only: Select this option to install the database software only but not create a database or configure Automatic Storage Management.
Select ASM Management Option	If you selected Configure Automatic Storage Management (ASM) from the Select Configuration Option window, and if you have Oracle Enterprise Manager 10g Grid Control installed, this window appears. Select Yes or No , depending on if you want to use Grid Control to manage Automatic Storage Management. If you select Yes , then select from the list of Enterprise Management agents to use.

Table 3–1 (Cont.) Oracle Universal Installer Windows

Window	Recommended Action
Configure Automatic Storage Management	<p>If you selected Configure Automatic Storage Management (ASM) from the Select Configuration Option window, this window appears. Enter the disk group name. The disk group list shows both candidate and member disks; you can click Show Candidates or Show All to filter their display. Then, select the redundancy level and member disks for the disk group.</p> <p>For Redundancy Level, choose one of the following. If you do not choose a redundancy level, the disk group defaults to normal redundancy.</p> <ul style="list-style-type: none"> ■ High: With this option, the contents of the disk group are three-way mirrored by default. To create a disk group with high redundancy, you must specify at least three failure groups (a minimum of three devices). ■ Normal: In a normal redundancy level, by default the data files of the disk group are two-way mirrored and the control files are three-way mirrored. You can choose to create certain files that are three-way mirrored or not mirrored. To create a disk group with normal redundancy, you must specify at least two failure groups (a minimum of two devices) for two-way mirroring. ■ External: If you select this option, Automatic Storage Management does not mirror the contents of the disk group. Choose this redundancy level when the disk group contains devices, such as RAID devices, that provide their own data protection; or your use of the database does not require uninterrupted access to data, for example, in a development environment where you have a suitable backup strategy.
Select Database Configuration	<p>Select the database configuration that best meets your needs: General Purpose, Transaction Processing, Data Warehouse, or Advanced.</p> <p>See the online Help provided by either Oracle Universal Installer or Oracle Database Configuration Assistant for a description of these preconfigured database types.</p> <p>Click Next.</p>
Specify Database Configuration Options	<p>Specify the following information, then click Next:</p> <p>Database Naming</p> <p>Specify the Global Database Name using the following syntax:</p> <p><i>database_name.domain</i></p> <p>where:</p> <ul style="list-style-type: none"> ■ <i>database_name</i> is the name of the database. It can contain no more than 30 characters (alphanumeric, underscore (_), dollar (\$) , and pound (#)). ■ <i>domain</i> is the domain used for the database. It can contain no more than 128 characters (alphanumeric, underscore (_), and pound (#)), inclusive of all periods. <p>For example:</p> <p>sales.us.mycompany.com</p> <p>When you enter the Global Database Name, Oracle Universal Installer automatically populates the SID field with the database name, but you can change this SID to another name. The SID can have no more than 64 characters (alphanumeric, dollar (\$), and pound (#)).</p> <p>Database Character Set</p> <p>Determine how character data is encoded in the database. The default is based on the operating system language. Select Unicode (AL32UTF8) to store multiple languages. See <i>Oracle Database Globalization Support Guide</i> for information on choosing a character set.</p> <p>Database Examples</p> <p>Choose this option to create the EXAMPLE tablespace that contains the Sample Schemas (optional, but recommended).</p>

Table 3–1 (Cont.) Oracle Universal Installer Windows

Window	Recommended Action
Select Database Management Option	Select one of the following, then click Next : <ul style="list-style-type: none"> ■ Use Grid Control for Database Management if you have Oracle Enterprise Manager installed. ■ Use Database Control for Database Management. Optionally, select Enable Email Notifications and then enter the outgoing SMTP server and e-mail address.
Specify Database File Storage Option	Select one of the following, then click Next . <ul style="list-style-type: none"> ■ File System: Specify the database file location. ■ Automatic Storage Management (ASM)
Specify Backup and Recovery Options	Select one of the following, then click Next . <ul style="list-style-type: none"> ■ Do not enable Automated backups ■ Enable Automated Backups: Specify the recovery area storage location and backup job credentials
Specify Database Schema Passwords	Enter and confirm passwords for the privileged database accounts, then 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.
Summary	Review the information displayed, then click Install .
Install	The Install window displays status information while the product is being installed.
Configuration Assistants	The Configuration Assistants window displays status information for the configuration assistants that configure the software and create a database. After Oracle Database Configuration Assistant finishes, review the information on the window. Make a note of the following information: <ul style="list-style-type: none"> ■ Enterprise Manager URL ■ Database creation log file location ■ Global Database Name ■ System Identifier (SID) ■ Server parameter file name and location Click OK to continue or click Password Management to unlock accounts and set passwords.
End of Installation	The configuration assistants configure several Web-based applications, including Oracle Enterprise Manager Database Control. This window displays the URLs configured for these applications. Make a note of the URLs used. The port numbers used in these URLs are recorded in the following file: <code>ORACLE_BASE\ORACLE_HOME\install\portlist.ini</code> To exit from Oracle Universal Installer, click Exit , then click Yes . Oracle Enterprise Manager Database Control displays in a Web browser.

Installing Automatic Storage Management

Follow the procedures in this section to install and configure Automatic Storage Management (ASM), and to install Oracle Database so that it can use ASM. If you do not plan to use Automatic Storage Management, use the procedure in ["Installing the Oracle Database Software"](#) on page 3-7 to install Oracle Database.

This section covers the following topics:

- [Step 1: Reviewing Automatic Storage Management Installation Considerations](#)
- [Step 2: Creating the ASM Instance and ASM Disk Groups](#)
- [Step 3: Installing Oracle Database to Use with Automatic Storage Management](#)
- [Step 4: Testing the Automatic Storage Management Installation](#)

Step 1: Reviewing Automatic Storage Management Installation Considerations

When you install Automatic Storage Management, follow these guidelines:

- Before you begin the installation, make sure that you have completed the steps in "[Preparing Disk Groups for an Automatic Storage Management Installation](#)" on page 2-15 to prepare a disk partition to use for the ASM disk groups.
- Oracle recommends that you install Automatic Storage Management into its own Oracle home, regardless of whether you plan to have one or multiple database instances. Installing Automatic Storage Management into its own Oracle home helps ensure higher availability and manageability.

With separate Oracle homes, you can upgrade Automatic Storage Management and databases independently, and you can deinstall database software without impacting the Automatic Storage Management instance. Make sure that the Automatic Storage Management instance version is the same or later than the Oracle Database version.

If an Automatic Storage Management instance does not already exist and you select the Oracle Universal Installer option to install and configure Automatic Storage Management only, Oracle Universal Installer installs Automatic Storage Management in its own Oracle home.

- Each computer that has one or more Oracle Database instances that will use Automatic Storage Management must have one ASM instance. For example, if a computer has two Oracle Database instances that use ASM, you only need one ASM instance for that computer, to manage the two database instances that use ASM.
- When you install Automatic Storage Management, Oracle Database Configuration Assistant creates a separate server parameter file (*SPFILE*) and password file for the Automatic Storage Management instance.

Step 2: Creating the ASM Instance and ASM Disk Groups

The following steps explain how to create an ASM instance and an ASM disk group for storing the Oracle database files. You can create multiple disk groups for the ASM instance to manage, if you want. If you plan to use ASM for backup and recovery operations, Oracle recommends that you create a separate disk group for this purpose.

To install an ASM instance and configure its disk groups:

1. Log on as a member of the Administrators group to the computer on which 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. Insert Oracle Database installation media and navigate to the `database` directory. Alternatively, navigate to the directory where you downloaded or copied the installation files. Double-click `setup.exe` to start Oracle Universal Installer.

Use the same installation media to install Oracle Database on all supported Windows platforms.

3. In the Welcome window, select **Advanced Installation** and click **Next**.

See Also: [Table 3-1](#) for a detailed description of the windows used in this procedure

4. In the Select Installation Type window, select either **Enterprise Edition**, **Standard Edition**, or **Personal Edition**, and then click **Next**.

5. In the Specify Home Details window, enter an Automatic Storage Management-specific name and directory location for the ASM instance.

For example, you could change `OraDB10g_home1` to `OraDB10g+asm` for the ASM home, and `DRIVE_LETTER:\oracle\product\10.2.0\db_1` to `DRIVE_LETTER:\oracle\product\10.2.0\asm`.

6. Click **Next**.

7. In the Product-Specific Prerequisite Checks window, check for and correct any errors that may have occurred when Oracle Universal Installer checked your system. Then click **Next**.

8. In the Select Configuration Option window, select **Configure Automatic Storage Management (ASM)** and then specify and confirm the ASM SYS password. Then click **Next**.

9. In the Configure Automatic Storage Management window, enter the following settings:

This window lets you create the disk groups to use with the ASM instance. You must have an available partition to create disk groups.

- **Disk Group Name:** Enter a name for the disk group.
- **Redundancy:** Select one of the following choices to set the redundancy level for the disks within the disk group. If you do not specify a redundancy level, the disk group defaults to normal redundancy.
 - **High:** With this option, the contents of the disk group are three-way mirrored by default. To create a disk group with high redundancy, you must specify at least three failure groups (a minimum of three devices).
 - **Normal:** In a normal redundancy level, by default the data files of the disk group are two-way mirrored and the control files are three-way mirrored. You can choose to create certain files that are three-way mirrored or not mirrored. To create a disk group with normal redundancy, you must specify at least two failure groups (a minimum of two devices) for two-way mirroring.
 - **External:** If you select this option, Automatic Storage Management does not mirror the contents of the disk group. Choose this redundancy level when the disk group contains devices, such as RAID devices, that provide their own data protection; or your use of the database does not require uninterrupted access to data, for example, in a development environment where you have a suitable backup strategy.
- **Add Disks:** Click **Stamp Disks** to start the `asmtoolg` GUI tool. In the `asmtool` operation dialog box, select **Add or change label**, and then click **Next**. From the list, select the disks that you want to use for the disk group. To select multiple disks, hold down the **Control** key and click to pick individual

disks, or hold down the **Shift** key to select disks in a group. To use a specific prefix for this disk group, select **Generate stamps with this prefix** and enter a name. Click **Next**, and in the next window, click **Finish**.

After you click **Finish**, the Configure Automatic Storage Management window returns, with the disks you selected in the Add Disks list. From this list, select the disks you want to include in the disk group. To filter the display of disks, you can select **Change Disk Discovery Path** and enter a wildcard subset. For example, to list all disks ending with ORCLDISKDATA from 0 to 3, you enter `\\.\ORCLDISKDATA[0-3]`.

10. Click **Next**.

11. In the Install window, check the installed contents, and then click **Install**.

12. To create another disk group for this instance, run Oracle Database Configuration Assistant and select the **Configure Automatic Storage Management** option.

At this stage, subsequent databases that you create are able to use Automatic Storage Management. If you have databases that were created before you installed ASM, you now can migrate them to ASM by using the Enterprise Manager Migrate Database wizard. This wizard is available in Enterprise Manager Grid Control or Database Control. Alternatively, you can use Oracle Database Recovery Manager (RMAN) to perform the migration.

See Also:

- Enterprise Manager Migrate Database wizard online Help instructions on how to migrate an existing Oracle database to Automatic Storage Management
- *Oracle Database Backup and Recovery Advanced User's Guide* for information on migrating an existing Oracle database to Automatic Storage Management using Oracle Database Recovery Manager.

Step 3: Installing Oracle Database to Use with Automatic Storage Management

After you have created the ASM instance and ASM disk groups, you are ready to create a database instance that can use Automatic Storage Management.

To create a database instance to use with ASM:

1. Log on as a member of the Administrators group to the computer on which 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 multiple home 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 2-8
- ["Installing Oracle Database on Computers with Multiple IP Addresses"](#) on page 2-8
- ["Installing Oracle Database on Computers with Multiple Aliases"](#) on page 2-8

3. Start Oracle Universal Installer.
4. In the Welcome window, select **Advanced Installation** and click **Next**.

See Also: [Table 3–1](#) for a detailed description of the windows used in this procedure

5. In the Select Installation Type window, select from the installation types (**Enterprise Edition**, **Standard Edition**, **Personal Edition**, or **Custom**), and then click **Next**.
6. In the Specify Home Details window, select a different Oracle home from the home used for Automatic Storage Management.
7. If you selected the Custom installation type, select from the products to install.
8. In the Product-Specific Prerequisite Checks window, check for and correct any errors that may have occurred when Oracle Universal Installer checked your system. Then, click **Next**.
9. In the Select Configuration Option window, select **Create a Database**.
10. In the Select Database Configuration window, select from the database types displayed and click **Next**.
11. In the Specify Database Configuration Options window, enter the following settings and then click **Next**.

- **Database Naming:** Enter a name for the database.
- **Database Character Set:** Select the database character set to use. The default offered is based on the character set that your operating system uses.
- **Database Examples:** Select this option to create the EXAMPLE tablespace, which contains sample schemas. (Optional, but recommended)

12. In the Select Database Management Option window, select either **Use Grid Control for Database Management** if you have Oracle Enterprise Manager installed, or if you do not have Enterprise Manager, select **Use Database Control for Database Management**. Optionally, select **Enable Email Notifications** and then enter the outgoing SMTP server and e-mail address. Then, click **Next**.

After you complete the installation, you can use either of these utilities to manage the Automatic Storage Management instance.

13. In the Specify Database Storage Option window, select **Automatic Storage Management (ASM)** and click **Next**.
14. In the Specify Backup and Recovery Options window, select the following:
 - **Enable Automated Backups:** Select this option, and then select **Automatic Storage Management**.

- **Backup Job Credentials:** Enter the user name and password of the person responsible for managing backups.
15. Click **Next**.
 16. In the Select ASM Disk Group window, select the ASM disk group that you created in "[Step 2: Creating the ASM Instance and ASM Disk Groups](#)" on page 3-13 for recovery and backups.

If the ASM disks that you selected do not provide enough space, the Configure Storage Management window appears so that you can select additional disks as needed. As you select the disks, the Required Storage Space area adjusts the sizes displayed. Ideally, the **Additional Space Needed** value is a negative number.
 17. Click **Next**.
 18. In the Specify Database Schema Passwords window, enter and confirm passwords for the privileged database accounts, then click **Next**.
 19. In the Summary window, check that the contents to be installed are correct, and then click **Install**.

Step 4: Testing the Automatic Storage Management Installation

To test the Automatic Storage Management installation, try logging on to the ASM instance by using SQL*Plus or iSQL*Plus.

Follow these steps:

1. In the **Services** Control Panel, make sure that the OracleASMSERVICE+ASM service has started.
2. Open a Windows command prompt and temporarily set the ORACLE_HOME and ORACLE_SID to point to your ASM instance.

For example, if the ASM SID, which is named +ASM, is located in the asm directory under the ORACLE_BASE directory, you would enter commands similar to the following:

```
SYSTEM_DRIVE:\> set ORACLE_SID = +ASM
SYSTEM_DRIVE:\> set ORACLE_HOME = c:\oracle\product\10.2.0\asm
```

3. From the same Windows command prompt session, connect to the ASM instance as the SYS user with SYSDBA privilege and start the instance if necessary:

```
SYSTEM_DRIVE:\> sqlplus sys/SYS_password as sysdba
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;
```

See Also:

- *Oracle Database Utilities* for more information about the asmcmd utility
- "[Managing Automatic Storage Management](#)" on page 5-4 for other tools that you can use to manage ASM
- *Oracle Database Administrator's Guide* for a more detailed description of Automatic Storage Management

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 had patches applied to it. When you clone an Oracle home, the new Oracle home will have the patch updates.

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, as well as cloning Oracle homes.

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 `installActionsdate_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_BASE\ORACLE_HOME\OPatch> set ORACLE_HOME = ORACLE_HOME_using_patch
c:\ORACLE_BASE\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 **Programs**, then **Oracle - HOME_NAME**, then **Configuration and Migration Tools**, then **Administrative Assistant for Windows**.
- **Microsoft Windows Services utility:** From the **Start** menu, select **Programs**, 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:\oracle\product\10.2.0\db_1`, you would zip the `db_1` directory, leaving out the `admin`, `flash_recovery_area`, and `oradata` directories that are under `10.2.0`. These directories will be 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_BASE\ORACLE_HOME\network\admin` directory, such as `listener.ora`, `sqlnet.ora`, and `tnsnames.ora`.
- b. From the `oui\bin` directory, run Oracle Universal Installer in clone mode for the unzipped Oracle home. Use the following syntax:

```
c:\ORACLE_BASE\ORACLE_HOME\oui\bin> setup.exe -silent -clone ORACLE_
HOME="target location" ORACLE_HOME_NAME="unique_name_on_node"
[-responseFile full_directory_path]
```

For example:

```
c:\ORACLE_BASE\ORACLE_HOME\oui\bin> setup.exe -silent -clone ORACLE_
HOME="c:\oracle\product\10.2.0\db_1" ORACLE_HOME_NAME="db_1"
```

The `-responseFile` parameter is optional. You can supply clone-time parameters on the command line or by using the response file named on the command line.

Oracle Universal Installer starts, and then records the cloning actions in the `cloneActionstimestamp.log` file. This log file is normally located in `c:\Program Files\Oracle\Inventory\logs`.

9. 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 **Programs**, then **Oracle - HOME_NAME**, then **Configuration and Migration Tools**, and then **Database Configuration Assistant**.

10. To configure connection information for the new database, run Net Configuration Assistant.

To start Net Configuration Assistant, select **Start**, then **Programs**, then **Oracle - HOME_NAME**, then **Configuration and Migration Tools**, and then **Net 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 additional information about cloning an Oracle home

Oracle Database Postinstallation Tasks

This chapter describes the following postinstallation configuration tasks:

- [Installing the Latest Patch Set Release](#)
- [Validating Invalid PL/SQL Modules](#)
- [Configuring Oracle Components](#)

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 *OracleMetaLink*. After logging in to *OracleMetaLink*, select *Patches* from the left-hand column.

To find and download patches:

1. Go to the *OracleMetaLink* Web site at
<http://metalink.oracle.com/>
2. Log in to *OracleMetaLink*.

Note: If you are not an *OracleMetaLink* registered user, then click **Register for MetaLink!** and follow the registration instructions.

3. Click **Patches** on the main *OracleMetaLink* page.
4. Select **Simple Search**.
5. Specify the following information, then click **Go**:
 - In the **Search By** field, select **Product or Family**, then specify RDBMS Server.
 - In the **Release** field, specify the current release number.
 - In the **Patch Type** field, specify Patchset/Minipack
 - In the **Platform or Language** field, select your platform.
6. Find the latest patch set for Oracle Database using *OracleMetaLink*.
7. From the list of available patches, select a patch to download.

Patch sets for Oracle databases are identified as *x.x.x PATCH SET FOR ORACLE DATABASE SERVER*.
8. Review the README file before proceeding with the download.

Each patch has a README file with installation requirements and instructions. Some patches install with Oracle Universal Installer; others require special procedures. Oracle recommends that you always read the README file before proceeding.

9. Download and install the patch.

Validating Invalid PL/SQL Modules

Oracle recommends running 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 already be valid.

1. Start SQL*Plus:

```
SYSTEM_DRIVE:\> sqlplus /nolog
```

2. Connect to the database with the `SYS` account:

```
SQL> CONNECT SYS/PASSWORD@service_name AS SYSDBA
```

where `PASSWORD` is the password you assigned to the `SYS` account during installation.

3. Start the database (if necessary):

```
SQL> STARTUP
```

4. Run the `utlrp.sql` script, which by default is located in `ORACLE_BASE\ORACLE_HOME\rdbms\admin\utlrp.sql`. For example:

```
SQL> @c:\oracle\product\10.2.0\rdbms\admin\utlrp.sql
```

Configuring Oracle Components

You must configure many Oracle components and options before you can use them. Before using individual Oracle Database components or options, see the appropriate manual available on the Oracle Database 10g Release 2 (10.2) Online Documentation Library and the Oracle Technology Network Web site.

This section contains these topics:

- [Configuring Oracle Administration Assistant for Windows](#)
- [Installing Natively Compiled Java Libraries for Oracle JVM and Oracle interMedia](#)
- [Running Oracle Cluster Synchronization Services from a Different Oracle Home](#)
- [Configuring Oracle Counters for Windows Performance Monitor](#)
- [Configuring Oracle Label Security](#)
- [Configuring Oracle Net Services](#)
- [Installing Oracle Text Supplied Knowledge Bases](#)

- [Configuring or Reinstalling Oracle XML DB](#)
- [Configuring PL/SQL External Procedures](#)
- [Configuring Shared Server Support](#)
- [Setting Credentials for the Job System to Work with Enterprise Manager](#)
- [Configuring Oracle Database to Communicate with Automatic Storage Management](#)
- [Configuring Databases to Use Oracle Enterprise Manager Database Control](#)
- [Using Oracle9i Language and Definition Files with Oracle Database 10g Release 1 \(10.1\)](#)
- [Installing Oracle Database Components from the Companion CD](#)

Note: You need only perform postinstallation tasks for components that you intend to use.

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 2.0 ships with Windows 2003 and Windows XP. Oracle recommends the latest MMC version available.

See Also: Microsoft documentation at

<http://www.microsoft.com/>

Installing Natively Compiled Java Libraries for Oracle JVM and Oracle *interMedia*

If you plan to use Oracle Java Virtual Machine (JVM) or Oracle *interMedia*, Oracle recommends that you install the natively compiled Java libraries (NCOMPs) used by those components from the Oracle Database Companion CD. These libraries are required to improve the performance of the components on your platform.

See Also: "[Installing Oracle Database Components from the Companion CD](#)" on page 4-7 for more information about installing components from the Companion CD

Running Oracle Cluster Synchronization Services from a Different Oracle Home

To reconfigure Oracle Cluster Synchronization Services (CSS) to run from a different Oracle home, enter the following at the command prompt:

```
localconfig reset [destination_Oracle_home]
```

where *destination_Oracle_home* is required if you run this command from the Oracle home where the CSS service is currently configured.

See Also: "[Removing Oracle Cluster Synchronization Services](#)" on page 6-1

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 using the

operfcfg.exe executable located in the `ORACLE_BASE\ORACLE_HOME\bin` directory.

To set the system password, enter the following:

```
SYSTEM_DRIVE:\> ORACLE_BASE\ORACLE_HOME\bin\operfcfg.exe -U SYSTEM -P password -D  
TNS_Alias_for_database
```

See Also: *Oracle Database Platform Guide for Microsoft Windows (x64)* for additional information about Oracle Counters for Windows Performance Monitor

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

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.

To use the listener from the current release, you may need to 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.

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 Companion CD.

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
- ["Installing Oracle Database Components from the Companion CD"](#) on page 4-7 for more information about installing components from the Companion CD

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*

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 10g Release 2 (10.2) database, you need to manually configure them.

See Also: "Developing Applications for Windows" of *Oracle Database Platform Guide for Microsoft Windows (x64)*

Configuring Shared Server Support

Configuring shared server support depends on how support was 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 (x64)*

Setting Credentials for the Job System to Work with Enterprise Manager

Windows systems require that you set the correct credentials for the Jobs system to work properly in 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 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 needs to submit an 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**.
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**
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.)
 - 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`.

Configuring Oracle Database to Communicate with Automatic Storage Management

On Windows, Oracle Database installations that use 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_BASE\ORACLE_HOME\network\admin`, and make sure that it has NTS enabled. For example:

```
sqlnet.authentication_services=(NTS)
```

See Also: *Oracle Database Platform Guide for Microsoft Windows (32-Bit)* for more information about Windows native authentication

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 Advanced Configuration* for information on configuring a database to use Database Control

Using Oracle9i Language and Definition Files with Oracle Database 10g Release 1 (10.1)

You can use Oracle9i database language and territory definition files with Oracle Database 10g Release 2 (10.2).

To enable this functionality:

1. Run the `cr9idata.pl` script, by default located in `ORACLE_BASE\ORACLE_HOME\nls\data\old`.

Alternatively, before you install Oracle Database, you can run the Oracle Universal Installer `setup` command with the `b_cr9idata` variable set to `true`, as follows:

```
setup.exe oracle.rsf.nlsrtl_rsf:b_cr9idata=true
```

2. Set the `ORA_NLS10` environment variable to point to the directory where you installed the new language and territory definition files, which by default are in `ORACLE_BASE\ORACLE_HOME\nls\data`.
3. Restart Oracle Database.

See Also:

- [Appendix C, "Installing and Configuring Oracle Database Using Response Files"](#) for information about response files, in which you can set the `b_cr9idata` variable and then run the response file with Oracle Universal Installer
- [Appendix D, "Configuring Oracle Database Globalization Support"](#) for information about globalization support that is affected by this release of Oracle Database
- *Oracle Database Globalization Support Guide* for information about the `NLS_LANG` parameter and Globalization Support initialization parameters

Installing Oracle Database Components from the Companion CD

The Oracle Database Companion CD contains additional database-related components that you can install. Whether you need to install these components depends on which Oracle Database components or features you plan to use. If you plan to use the following components or features, Oracle recommends that you install the components from the Companion CD:

- JPublisher
- Oracle Database Examples (formerly Oracle Demos)

- Oracle JVM
- Oracle *interMedia*
- Oracle Text Supplied Knowledge Bases
- Oracle Ultra Search

See Also: *Oracle Database Companion CD Installation Guide*, available on the Companion CD, for detailed installation information

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](#)
- [Starting and Stopping an Oracle Database](#)
- [Managing Automatic Storage Management](#)
- [Accessing Oracle Database with SQL*Plus or iSQL*Plus](#)
- [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](#)

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 **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.

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 Automatic Storage Management.

To log in to Oracle Enterprise Manager Database Control:

1. Open your Web browser and enter the following URL

```
http://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_BASE\ORACLE_HOME\install\portlist.ini` file:

```
Enterprise Manager Console HTTP Port (db_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 Console Ports"](#) on page E-4 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 `SYSMAN` database user account. Enterprise Manager displays the Oracle Database home page.

Use the password you specified for the `SYSMAN` account during the Oracle Database installation.

See Also:

- ["Setting Credentials for the Job System to Work with Enterprise Manager"](#) on page 4-6 if you have difficulty logging into Enterprise Manager Database Control
- ["Reviewing User Accounts and Passwords"](#) on page 5-6

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.

See Also: ["Logging in to Enterprise Manager Database Control"](#) on page 5-2

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 a new 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 **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.

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](#)

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 5-2

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.

Starting and Stopping the Database with Oracle Administration Assistant for Windows

Oracle Administration Assistant is available from the Custom installation type.

To start or stop the database:

1. From the **Start** menu, select **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 that you want, and from the menu, select from the following options:
 - **Connect Database**

- **Start Service**
- **Disconnect Database**
- **Stop Service**
- **Startup/Shutdown Options**

Starting and Stopping the Database from the Microsoft Windows Services Utility

To start or stop the database:

1. From the **Start** menu, select **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 start-up properties, right-click **Properties**, and in the dialog box, select either **Automatic**, **Manual**, or **Disabled**.

Managing Automatic Storage Management

This section covers the following topics:

- [Starting and Stopping Automatic Storage Management](#)
- [Automatic Storage Management Utilities](#)

Starting and Stopping Automatic Storage Management

To start and stop Automatic Storage Management, in addition to using SQL*Plus or iSQL*Plus, you can use the Windows **Services** utility.

To start Automatic Storage Management using the **Services** utility:

1. From the **Start** menu, select **Programs**, then **Administrative Tools**, and then **Services**.
2. In the Services dialog box, start the following services by right-clicking their names and in the menu, select **Start**:
 - OracleCSService
 - OracleASMSERVICE+ASM

To set the startup properties for these services, right-click **Properties**, and in the Properties dialog box, under Startup Type, select **Automatic**, **Manual**, or **Disabled**.

3. Exit **Services**.

To stop Automatic Storage Management using the **Services** utility:

1. From the **Start** menu, select **Programs**, then **Administrative Tools**, then **Services**.
2. In the Services dialog box, Shut down any databases that use ASM. Names of Oracle databases are preceded with OracleService.
3. Right-click the OracleCSService and Oracle ASMSERVICE+ASM services and from the menu, select **Stop**.

4. Exit Services.

See Also: *Oracle Database Administrator's Guide* for information on starting and stopping ASM instances by using SQL*Plus or iSQL*Plus

Automatic Storage Management Utilities

To manage Automatic Storage Management, you can use the following tools:

- **asmcmd:** This command-line tool lets you manage ASM disk group files and directories.
- **Oracle Enterprise Manager Grid Control:** If you have Oracle Enterprise Manager installed, you can use Grid Control to manage Automatic Storage Management functions such as migrating an existing database to ASM, checking the status of the ASM instance, checking the performance of the ASM disk groups, creating or dropping ASM disk groups, and so on.
- **Oracle Enterprise Manager Database Control:** This utility lets you perform functions similar to Grid Control.
- **SQL*Plus or iSQL*Plus:** You can use Automatic Storage Management-specific commands from either of these tools. To connect to the ASM 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 5-2
- *Oracle Database Administrator's Guide* for more information about managing Automatic Storage Management
- *Oracle Database Utilities* for more information about the asmcmd utility

Accessing Oracle Database with SQL*Plus or iSQL*Plus

To issue SQL and PL/SQL statements to Oracle Database, you can use either SQL*Plus or its Web version, iSQL*Plus. These tools enable you to perform the same database management operations, as well as to query, insert, update, or delete data directly in the database.

To start SQL*Plus:

1. From the **Start** menu, select **Programs**, then **Oracle - HOME_NAME**, then **Application Development**, and then **SQL Plus**.
2. In the Log On dialog box, enter the user name, password, and for the host string, the name of the database to which you want to connect.

Alternatively, at the command line, you can enter the following command at a Windows command prompt:

```
SYSTEM_DRIVE:\> sqlplus user_name/password
```

For example, to log on as SYSTEM using the password welcome, you enter:

```
SYSTEM_DRIVE:\> sqlplus system/welcome
```

If you are logging on as SYS, you would need to connect as SYSDBA:

```
SYSTEM_DRIVE:\> sqlplus sys/welcome as sysdba
```

To start *iSQL*Plus*:

1. Open your Web browser and enter the following URL:

`http://hostname:port/isqlplus`

If you are unsure of the correct port number to use, check the `ORACLE_BASE\ORACLE_HOME\install\portlist.ini` file.

Note: The `portlist.ini` file is not updated if you change a port number after you install Oracle Database. "[Changing the *iSQL*Plus* Ports](#)" on page E-4 explains how to find the *iSQL*Plus* port number in this situation

2. In the Login window, enter the user name, password, and for the connect identifier, the name of the database to which you want to connect.

See Also:

- *SQL*Plus User's Guide and Reference*
- *SQL*Plus Quick Reference*

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. [Table 5–1](#) describes these accounts, listing their user names and passwords.

See Also:

- "[Unlocking and Changing Passwords](#)" on page 5-8 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 (32-Bit)* 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

Reviewing Administrative Accounts

[Table 5–1](#) describes the administrative user names.

Table 5–1 Administrative Accounts

User Name	Description	See Also
ANONYMOUS	Allows HTTP access to Oracle XML DB.	Not applicable
BI	Owns the Business Intelligence schema included in the Oracle Sample Schemas. It is only available if you loaded the Sample Schemas.	<i>Oracle Database Sample Schemas</i>
CTXSYS	The Oracle Text account.	<i>Oracle Text Reference</i>

Table 5–1 (Cont.) Administrative Accounts

User Name	Description	See Also
DBSNMP	Used by Management Agent of Oracle Enterprise Manager to monitor and manage the database. This account is created only if you configure the database to use Database Control.	<i>Oracle Enterprise Manager Grid Control Installation and Basic Configuration</i>
DIP	Used by Directory Integration Platform (DIP) to synchronize the changes in Oracle Internet Directory with the applications in the database.	<i>Oracle Internet Directory Administrator's Guide</i>
DMSYS	Performs data mining operations.	<i>Oracle Data Mining Administrator's Guide</i>
EXFSYS	Owens the Expression Filter schema.	None
HR	Owens the Human Resources schema included in the Oracle Sample Schemas. It is available only if you loaded the Sample Schemas.	<i>Oracle Database Sample Schemas</i>
IX	Owens the Information Transport schema included in the Oracle Sample Schemas. This account is available only if you loaded the Sample Schemas.	<i>Oracle Database Sample Schemas</i>
LBACSYS	The Oracle Label Security administrator account.	<i>Oracle Label Security Administrator's Guide</i>
MDDATA	Used by Oracle Spatial for storing Geocoder and router data.	<i>Oracle Spatial User's Guide and Reference</i>
MDSYS	The Oracle Spatial and Oracle Locator administrator account.	<i>Oracle Spatial User's Guide and Reference</i>
MGMT_VIEW	Used by Oracle Enterprise Manager Database Control.	None
OE	Owens the Order Entry schema included in the Oracle Sample Schemas. This account is available only if you loaded the Sample Schemas.	<i>Oracle Database Sample Schemas</i>
OLAPSYS	Owens the OLAP catalogs	<i>Oracle OLAP Application Developer's Guide</i>
ORDPLUGINS	The Oracle <i>interMedia</i> Audio and Video account. Plug-ins supplied by Oracle and third party plug-ins are installed in this schema.	<i>Oracle interMedia Reference</i>
ORDSYS	The Oracle <i>interMedia</i> Audio, Video, Locator, and Image administrator account.	<i>Oracle interMedia Reference</i>
OUTLN	Centrally manages metadata associated with stored outlines. Supports plan stability, which enables maintenance of the same execution plans for the same SQL statements.	<i>Oracle Database Performance Tuning Guide</i>
PM	Owens the Product Media schema included in the Oracle Sample Schemas. This account is created only if you loaded the Sample Schemas.	<i>Oracle Database Sample Schemas</i>
SCOTT	An account used by Oracle sample programs and examples.	<i>Oracle Database Administrator's Guide</i>
SH	Owens 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	<i>Oracle Database Sample Schemas</i>
SI_INFORMTN_SCHEMA	Stores the information views for the SQL/MM Still Image Standard.	<i>Oracle interMedia Reference</i>

Table 5–1 (Cont.) Administrative Accounts

User Name	Description	See Also
SYS	Used for performing database administration tasks.	<i>Oracle Database Administrator's Guide</i>
SYSMAN	The account used to perform Oracle Enterprise Manager database administration tasks. This account is created only if you configure the database to use the Database Control.	<i>Oracle Enterprise Manager Grid Control Installation and Basic Configuration</i>
SYSTEM	Used for performing database administration tasks.	<i>Oracle Database Administrator's Guide</i>
WMSYS	The account used to store the metadata information for Oracle Workspace Manager.	<i>Oracle Database Application Developer's Guide - Workspace Manager</i>
XDB	Used for storing Oracle XML DB data and metadata.	<i>Oracle XML DB Developer's Guide</i>

See Also:

- "Privileges, Roles, and Security Policies" of *Oracle Database Concepts*
- "The Oracle Database Administrator" of *Oracle Database Administrator's Guide*
- "Administering External Users and Roles on Windows" of *Oracle Database Platform Guide for Microsoft Windows (32-Bit)*

Unlocking and Changing 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 to unlock only the user names you will use.

If you created a starter database during the installation, but you did not unlock the required account, unlock the account using one of the following methods:

- [Using SQL*Plus to Unlock and Change Passwords](#)
- [Using Enterprise Manager Database Control to Unlock and Change Passwords](#)

Note: To permit unauthenticated access to your data through HTTP, unlock the ANONYMOUS account.

See Also: *Oracle Database Administrator's Guide* for more information about:

- Unlocking and changing passwords after installation
- Oracle security procedures
- Security best practices

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/SYS_password as sysdba
```

3. Enter a command similar to the following, where *account* is the user account that you want 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.
- The IDENTIFIED BY *password* clause resets the password.

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 5-2

2. Click **Administration**.

3. In the Security section of the Administration 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.

Identifying Databases

The Oracle Database 10g 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. For example:

```
sales.us.mycompany.com
```

In this example:

- *sales* is the name of the database. The database name portion is a string of no more than 30 characters that can contain alphanumeric, underscore (_), dollar (\$),

and pound (#) characters. The `DB_NAME` initialization parameter specifies the database name.

- `us.mycompany.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_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\ORACLE_HOME\orcl` directory, and the initialization parameter file is located in the `ORACLE_BASE\admin\orcl\pfile` directory.

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 do not need to 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 `spfileSID.ora` and is located in the `ORACLE_BASE\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.

See Also: ["Logging in to Enterprise Manager Database Control"](#) on page 5-2

2. Click **Administration**.
3. In the Instance section of the Administration 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 (x64)* for a list of Oracle Database-specific initialization parameters for Windows and their default values
- *Oracle Database Reference* for more information about initialization parameters

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 10g release 2 (10.2) databases.

[Table 5–2](#) 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 5–2 *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 <code>SYSTEM</code> tablespace. Some products and options that previously used the <code>SYSTEM</code> tablespace now use the <code>SYSAUX</code> tablespace to reduce the load on the <code>SYSTEM</code> 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 are running a SQL statement that involves a lot of sorting, such as the constructs <code>GROUP BY</code> , <code>ORDER BY</code> , or <code>DISTINCT</code> , then you may need to 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 tablespaces currently available in your database:

1. Log in to Database Control.

See Also: ["Logging in to Enterprise Manager Database Control"](#) on page 5-2

2. Click **Administration**.
3. In the Storage section of the Administration page, click **Tablespaces**.

Enterprise Manager displays a table containing all the tablespaces currently defined for this database instance. 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*

Locating Redo Log Files

A redo log can be either an online redo log or an archived redo log. The online redo log is a set of two or more redo log groups that records all changes made to Oracle data files and control files. An archived redo log is a copy of an online redo log that has been copied to an offline destination. If the database is in ARCHIVELOG mode and automatic archiving is enabled, then the archive process or processes copy each online redo log to one or more archive log destinations after it is filled.

The starter database and the custom database each contain three redo log files located in the `ORACLE_BASE\oradata\DB_NAME` directory. Redo log files hold a record of all changes made to data in the database buffer cache. If an instance fails, then Oracle Database uses the redo log files to recover the modified data in memory.

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"](#) on page 5-2

2. Click **Administration**.
3. In the Storage section of the Administration 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 Basics*
- "Managing Archived Redo Logs" in *Oracle Database Administrator's Guide*

Locating Control Files

The starter database and the custom database contain three control files located in the `ORACLE_BASE\oradata\DB_NAME` directory. Oracle recommends that you keep at least three 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](#)" on page 5-2

2. Click **Administration**.
3. In the Storage section of the Administration page, click **Controlfiles**.

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

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_NAME_TNSListener` (Oracle Database listener service)

If you installed Oracle Enterprise Manager Database Control, then the `OracleDBConsoleSID` service is automatically started. In you configured Automatic Storage Management, the `OracleCSService` and `OracleASMServices+ASM` services are listed as well. However, other services for networking or other individual components may not automatically start.

Removing Oracle Database Software

This chapter describes how to remove Oracle databases, instances, and software:

- [Removing Oracle Cluster Synchronization Services](#)
- [Removing All Oracle Database Components](#)

Note: Always use Oracle Universal Installer to remove Oracle components. To avoid installation and configuration problems with new Oracle installations, follow the instructions in this chapter.

See Also:

- *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for information about removing an Oracle Real Application Clusters installation
- Component-specific documentation for individual requirements and restrictions

Removing Oracle Cluster Synchronization Services

The first time you install Oracle Database, if you selected Automatic Storage Management as a storage and recovery option, Oracle Universal Installer configures and starts a single-instance version of the Oracle Cluster Synchronization Services (CSS) service.

If you did not choose Automatic Storage Management as a storage or recovery option, you can delete the `OracleCSService` service. To delete this service without deleting the Oracle home, perform the following:

1. Open a command prompt window.
2. Temporarily set the `ORACLE_HOME` environment variable. For example:

```
set ORACLE_HOME=c:\oracle\product\10.2.0\db_1
```

3. Run the `localconfig` batch file with the `delete` option to delete the `OracleCSService` service. For example:

```
SYSTEM_DRIVE:\> oracle\product\10.2.0\db_1\bin\localconfig delete
```

Note: You do not need to complete this step if you are removing the Oracle home.

See Also: ["Running Oracle Cluster Synchronization Services from a Different Oracle Home"](#) on page 4-3

Removing All Oracle Database Components

Use Oracle Universal Installer to remove Oracle components from the inventory on the computer. Afterward, you need to manually remove the remaining components.

Do not delete Oracle home files or directories (for example, using Windows Explorer or the command prompt) without first using Oracle Universal Installer unless you exit Oracle Universal Installer during an installation. Otherwise, the components in the Oracle home remain registered in the Oracle Universal Installer inventory. If you manually delete Oracle home files and you attempt an installation in the same Oracle home, then some or all of the selected components may not be installed or properly configured.

Oracle Universal Installer does not register the installation in its inventory if the installation is unexpectedly interrupted. However, files may have been copied to your Oracle home. Remove these files manually and restart the installation.

Note: You can use Oracle Database Configuration Assistant to remove an instance and related services. For information about Oracle Database Configuration Assistant, see "Installing Oracle and Building the Database" chapter of *Oracle Database 2 Day DBA*.

This section contains these steps:

1. [Stopping Oracle Services](#)
2. [Removing Components with Oracle Universal Installer](#)
3. [Manually Removing the Remaining Oracle Database Components](#)

Stopping Oracle Services

You must first stop the Oracle services before removing Oracle components.

Follow these steps:

1. Open the Windows **Services** utility: From the **Start** menu, select **Programs**, then then **Administrative Tools**, and then **Services**.
2. If any Oracle services (names begin with `Oracle` or `Ora`) exist and have the status *Started*, then select each of the services, and click **Stop**.
3. Exit **Services**.

See Also: The Microsoft online Help for more information about stopping services

Removing Components with Oracle Universal Installer

To remove components with Oracle Universal Installer in interactive mode:

1. Ensure that you first follow the instructions in the "[Stopping Oracle Services](#)" section on page 6-2.
2. Start Oracle Universal Installer: From the **Start** menu, select **Programs**, then **Oracle - HOME_NAME**, then **Oracle Installation Products**, and then **Universal Installer**.

The Welcome window for Oracle Universal Installer appears.

3. Click the **Deinstall Products** button.

The Inventory window appears.

4. Expand the tree of installed components until you find the components to remove.

For example, if you installed a database with the Enterprise Edition option and later installed additional components with the Custom option, expand the Oracle home component to display all the components installed in the Oracle home.

5. Select the components to remove.
6. Click **Remove**.

The Confirmation window appears.

7. In the Confirmation dialog box, click **Yes** to remove the selected components.

Note: A message may appear indicating that removing some components may cause other components to not function properly.

After the components are removed from your computer, the Inventory window appears without the removed components.

8. Click **Close** to close the Inventory window.
9. Click **Cancel** to exit Oracle Universal Installer.
10. Click **Yes** to confirm that you want to exit.

Manually Removing the Remaining Oracle Database Components

Oracle Universal Installer does not remove all Oracle components. After using Oracle Universal Installer to remove Oracle components, you need to manually remove remaining registry keys, environment variables, **Start** menu options, and directories.

This section covers the following topics:

- [Removing an Automatic Storage Management Instance](#)
- [Removing Oracle Keys from the Microsoft Registry Editor](#)
- [Updating the System Variable Path](#)
- [Removing Oracle from the Start Menu](#)
- [Removing Oracle Directories](#)

Note: In rare situations, you may want to correct serious system problems by completely removing Oracle components manually from the computer without first deinstalling with Oracle Universal Installer. Do this only as a last resort, and only if you want to remove all Oracle components from your system.

Removing an Automatic Storage Management Instance

To remove an Automatic Storage Management (ASM) instance running in the Oracle home after the database has been removed, perform the following steps:

1. At the Windows command prompt, set the ORACLE_SID environment variable to the SID for the Automatic Storage Management instance. For example:

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

2. Start SQL*Plus and connect to the Automatic Storage Management instance as the SYS user:

```
SYSTEM_DRIVE:\> sqlplus sys/sys_password as sysdba
```

3. Enter the following command to determine whether any Oracle database instances are using the Automatic Storage Management instance:

```
SQL> SELECT INSTANCE_NAME FROM V$ASM_CLIENT;
```

This command lists all of the database instances that are using this Automatic Storage Management instance. This command only lists database instances that are running. It is possible that other instances are associated with the Automatic Storage Management instance, but they are not currently running.

If you removed a database from this Oracle home but the output from the command shows that this Automatic Storage Management instance is supporting a database instance in another Oracle home, do not remove the Automatic Storage Management instance or the Oracle home.

4. If there are no database instances associated with this Automatic Storage Management instance, drop the disk group associated with this instance.

Note: Dropping the Automatic Storage Management disk group makes the disk device available for use with another Automatic Storage Management instance, if required. However, all data in the disk group is lost. Make sure that no other database instance requires any data from this disk group before you drop it.

- a. Identify the disk groups associated with the Automatic Storage Management instance:

```
SQL> SELECT NAME FROM V$ASM_DISKGROUP;
```

- b. For each disk group that you want to delete, enter a command similar to the following:

```
SQL> DROP DISKGROUP disk_group_name INCLUDING CONTENTS;
```

5. Shut down the Automatic Storage Management instance and exit SQL*Plus:

```
SQL> SHUTDOWN
```

```
SQL> EXIT
```

6. At the command prompt, enter the following command to remove the Automatic Storage Management service:

```
ORADIM -DELETE -ASMSID +ASM
```

See Also:

- ["Automatic Storage Management"](#) on page 1-10
- ["Preparing Disk Groups for an Automatic Storage Management Installation"](#) on page 2-15

Removing Oracle Keys from the Microsoft Registry Editor

Oracle Universal Installer creates Windows services for Oracle components during installation but it does not delete all the services created by Oracle Net Configuration Assistant and Oracle Database Configuration Assistant during deinstallation. In addition, Oracle Universal Installer does not delete several other registry editor keys. You need to remove any existing registry keys manually by following the instructions in one of the following sections:

- [Removing the Oracle Net Service Registry Key](#)
- [Removing All Oracle Registry Keys](#)

Caution: Use Microsoft Registry Editor at your own risk. Incorrectly using the Registry Editor can cause serious problems and may require reinstallation of your operating system.

Removing the Oracle Net Service Registry Key

To remove only the Oracle Net Service registry entry (if it exists):

1. Log in as a member of the Administrators group.
2. Make sure that you have stopped Oracle services by following the instructions in the "[Stopping Oracle Services](#)" section on page 6-2.
3. From a command prompt, enter the following command:
`SYSTEM_DRIVE:\> regedit`
4. Go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services and delete the OracleHOME_NAME\TNSListener registry entry. Oracle Universal Installer automatically deletes all other Oracle Net services.
5. Exit the registry editor.
6. Restart your computer.

Removing All Oracle Registry Keys

Caution: These instructions remove *all* Oracle components, services, and registry entries from your computer. Use extreme care when removing registry entries. Removing incorrect entries can break your system. Do not delete any database files under `ORACLE_BASE\ORACLE_HOME\DB_NAME` until you have completed these instructions.

To remove all Oracle registry keys from a computer:

1. Log in as a member of the Administrators group.
2. Make sure that you have stopped Oracle services by following the instructions in the "[Stopping Oracle Services](#)" section on page 6-2.
3. Start the registry editor at the command prompt:
`SYSTEM_DRIVE:\> regedit`
4. Go to HKEY_CLASSES_ROOT.
5. Delete keys that begin with Ora, Oracle, Orcl, or EnumOra.

This collection of keys includes those that begin with the following:

- EnumOraHomes
 - OracleConfig
 - OracleDatabase
 - OracleHome
 - OracleInProcServer
 - OracleProcess
 - ORADC
 - ORAMMCCFG10
 - ORAMMCPMON10
 - OraOLEDB
 - OraPerfMon
 - ORCLMMC
 - ORCLSSO
6. Go to HKEY_CURRENT_USER.
 7. Delete the ORACLE key.
 8. Go to HKEY_CURRENT_USER\Software.
 9. Delete all Oracle keys, including Oracle-*HOME_NAME* entries under: Microsoft\Windows\CurrentVersion\Explorer\MenuOrder\Start Menu\Programs.
 10. Go to HKEY_LOCAL_MACHINE\SOFTWARE and search for the ORACLE group key. Select ORACLE and note the value of the inst_loc key. This is the location of Oracle Universal Installer. The default location is c:\Program Files\Oracle\Inventory. If this value is different, make a note of it so that you can delete it later.
 11. Delete the ORACLE Group key.
 12. Go to HKEY_LOCAL_MACHINE\SOFTWARE\ODBC.
 13. Expand all the subkeys under ODBC and remove any Oracle-related ODBC driver keys, except for the Microsoft ODBC for Oracle key. For example, the ODBC\ODBCINST.INI directory lists keys for each Oracle home.
 14. Go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services.
 15. Delete all keys under this branch that begin with Oracle or OraWeb.
 16. Go to HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Eventlog\Application.
 17. Delete all keys under this branch that begin with Oracle.
 18. Exit the registry editor.
 19. Restart your computer.

Updating the System Variable Path

Check the Path environmental variable and remove any Oracle entries.

1. Open **System** from the Control Panel.
2. In the System Properties dialog box, click the **Advanced** tab, then click the **Environment Variables** button.
3. Select the system variable `Path` and edit the `Path` variable to remove any Oracle entries.

For example, remove Oracle entries that contain `ORACLE_BASE\ORACLE_HOME` in the `Path` variable. You may see a `Path` variable that contains entries similar to the following:

```
C:\oracle\products\10.2.0\db_1\bin;C:\oracle\products\10.2.0\db_1\jre\1.4.2\bin\client;C:\oracle\products\10.2.0\db_1\jre\1.4.2\bin
```

If the JRE path was installed by Oracle, remove it.

4. If there is a `CLASSPATH` variable that was set for Oracle, delete it.
5. If there are any other Oracle variables set, remove them: `ORACLE_HOME`, `ORACLE_SID`, `TNS_ADMIN`, `JSERV`, or `WV_GATEWAY_CFG`.
6. Save your changes and then exit the Control Panel.

Removing Oracle from the Start Menu

Check the **Start** menu for any Oracle entries and remove them.

Follow these steps:

1. Select **Start**, then **Programs**, and then **Oracle - HOME_NAME**.
2. Right-click **Oracle - HOME_NAME**, and from the menu, select **Delete**.

You can also remove Oracle menu entries by using the following method:

1. Right-click the **Start** button to display the pop-up menu.
2. Select the **Explore All Users** option.
3. Under Documents and Settings, expand the `\Start Menu\Programs` folder.
4. Right-click and delete the **Oracle - HOME_NAME** folder.

Removing Oracle Directories

After removing all Oracle registry keys and restarting the computer, delete any existing Oracle directories and files.

Use My Computer or Windows Explorer to delete the following directories:

1. Delete the `SYSTEM_DRIVE:\Program Files\Oracle` directory.
2. Delete all `ORACLE_BASE` directories on your hard drive.
3. If Oracle Universal Installer was installed in a location other than the default, delete this directory.
4. Remove any Oracle temporary directory files from `SYSTEM_DRIVE:\Documents and Settings\user_name\Local Settings\Temp`.

Frequently Asked Questions about Installation

This appendix provides 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 \(Gateways\)](#)

Installing Oracle Database or Oracle Database Client

- [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 do 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 use *Oracle Database Quick Installation Guide*.
- If your site has special requirements, then see *Oracle Database Installation Guide*.

How do 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 *Oracle Database Installation Guide*. When you run Oracle Universal Installer, select the **Advanced Installation** method, and then select the database type you want in the Select Database Configuration window.

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, select **Advanced Installation**, then **Custom**, and from the Available Product Components window, select **Oracle OLAP**.

See Also:

- *Oracle OLAP Application Developer's Guide*
- *Oracle OLAP Reference*
- *Oracle OLAP DML Reference*
- *Oracle OLAP Java API Reference*
- *Oracle OLAP Analytic Workspace Java API Reference*

In an existing Oracle Database installation, you can run Oracle Database Configuration Assistant (DBCA) to create databases designed for data warehousing or transaction processing. To start DBCA, select **Start**, then **Programs**, then **Oracle - HOME_NAME**, then **Configuration and Migration Tools**, and then **Database Configuration Assistant**.

What's the best way to install multiple Oracle databases?

Use *Oracle Database Installation 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 an existing Oracle home:** Install Oracle Database on one computer using interactive mode. Afterwards, you can clone its existing Oracle home in each location and then create a new database from there. You can also clone databases, which is described in *Oracle Database Administrator's Guide*.

How do I configure client connections to an Oracle database?

1. Install Oracle Database onto your server by using *Oracle Database Installation Guide*.
2. Use *Oracle Database Client Installation Guide* to install Oracle Database Client on each client node.

If you have many client nodes, consider staging the software centrally, mapping the drive, and running Oracle Universal Installer in silent or noninteractive mode.

If your client nodes only require a default installation into a new Oracle home directory, consider using *Oracle Database Client Quick Installation Guide*.

What is the best way to install Oracle Database Client if my client nodes have limited disk space?

1. Use *Oracle Database Installation Guide* to install Oracle Database onto your server.
2. Use *Oracle Database Client Installation Guide* or *Oracle Database Client Quick 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 running Oracle Universal Installer in silent or noninteractive mode.

How do I upgrade Oracle Database?

See *Oracle Database Upgrade Guide*.

See Also: *Oracle Database Administrator's Guide* if you want to use 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 Clusterware either before or after you install Oracle Database.
- If you want a consolidated pool of storage for all databases in your cluster, then install Oracle Clusterware first and use Automatic Storage Management to manage this storage. Afterward, install Oracle Database (which can be either single instance or Oracle Real Application Clusters).
- If you plan to use Oracle Real Application Clusters, first install Oracle Clusterware, and then install Oracle Real Application Clusters.

See *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide* for your platform to install Oracle Clusterware or Oracle Real Application Clusters. Oracle Clusterware is available on the Oracle Clusterware installation media. *Oracle Database Installation Guide* explains how to install Automatic Storage Management as well as 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 together to act as a single system 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 Migration Workbench to migrate your non-Oracle databases and applications to Oracle. Oracle Migration Workbench software and documentation are available at

<http://www.oracle.com/technology/migration/index.html>

Installing Oracle Database Tools

- [How do I install Oracle Application Server?](#)
- [How do I administer and monitor my Oracle Database products?](#)
- [How do I manage security for my Oracle Database products?](#)
- [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 find hidden meaning in my data and predict likely outcomes based on my data?](#)
- [How do I perform backup and recovery operations for Oracle Database?](#)

How do I install Oracle Application Server?

See *Oracle Application Server Installation Guide*. How you install Application Server depends on whether you already have Oracle Database installed:

- If you do not have Oracle Database installed or you do not want Oracle Application Server to use any of your existing Oracle Databases, then Oracle Universal Installer lets you install Oracle Application Server with its own Oracle Database. This database is populated with the metadata that Oracle Application Server needs to run correctly.
- If you want Oracle Application Server to use an existing Oracle Database, then do the following:
 1. From the Oracle Application Server installation media, run Oracle Application Server Repository Creation Assistant to populate your database with the metadata that Oracle Application Server needs.
 2. Install the remaining Oracle Application Server components by following the instructions in the *Oracle Application Server Installation Guide*.

How do 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 the single database and listener that you are installing:

1. Use *Oracle Database Installation Guide* to install Oracle Database.
2. From Oracle Database, use Oracle 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 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 Installation and Basic Configuration* available on the Enterprise Manager Grid Control installation media

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 *Oracle Database Installation Guide* to install Oracle Database.
If you plan to use Oracle Real Application Clusters, then install Oracle Database by using *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Installation Guide*.
2. Use *Oracle Enterprise Manager Grid Control Installation and Basic Configuration* to install and configure Oracle Enterprise Manager. For postconfiguration tasks, use *Oracle Enterprise Manager Advanced Configuration*.

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 Application 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 by means of 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. To install the Oracle Internet Directory server components, run Oracle Universal Installer from an Oracle Application Server 10g installation.

See Also:

- *Oracle Application Server Installation Guide* (to install Oracle Identity Management)
- *Oracle Database Security Guide*
- *Oracle Database Advanced Security Administrator's Guide*
- *Oracle Database Enterprise User Administrator's Guide*
- *Oracle Label Security Administrator's Guide*
- *Oracle Application Server Security Guide*
- <http://www.oracle.com/technology/Deploy/security/index.html> for Oracle Technology Network topics on database security

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, select the **Custom** installation type, and in the Available Product Components window, select **Oracle OLAP**.

See Also:

- *Oracle OLAP Application Developer's Guide*
- *Oracle OLAP Reference*
- *Oracle OLAP DML Reference*
- *Oracle OLAP Java API Reference*
- *Oracle OLAP Analytic Workspace Java API Reference*

- Select the **Enterprise Edition** installation type, and then in the Select Database Configuration window, 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 find hidden meaning in my data and predict likely outcomes based on my data?

Yes. Install Oracle Data Mining, which is provided in the Oracle Database installation. 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 *Oracle Database Installation 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 window, select the **General Purpose** configuration.

If you want the database to execute predefined mining models, but not support model creation, install the Data Mining Scoring Engine instead of Oracle Data Mining. Use the following method in *Oracle Database Installation Guide* to install the Data Mining Scoring Engine:

1. When you run Oracle Universal Installer, select the **Custom** installation type.
2. In the Available Product Components window, select **Data Mining Scoring Engine**.

See Also: The following manuals after you have installed 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 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 demands of high-performance, manageable backup and recovery. Recovery Manager is native to the database, 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 Basics*
- *Oracle Database Backup and Recovery Advanced User's Guide*
- *Oracle Database Backup and Recovery Reference*
- *Oracle Database Backup and Recovery Quick Start Guide*

Installing Oracle Database with Oracle Applications

- [How do I install my Oracle applications with Oracle Database?](#)
- [How do I create Web applications that communicate with Oracle Database?](#)
- [How do I automate and streamline my processes for both traditional applications-based workflow and as e-business integration workflow?](#)
- [Which Web server can my Oracle applications use?](#)
- [How do I migrate my non-Oracle applications to Oracle Database?](#)

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 need to implement your applications with Oracle Real Applications Clusters databases, see *Oracle Database Oracle Clusterware and Oracle Real Application Clusters Administration and Deployment Guide*.

How do I create Web applications that communicate with Oracle Database?

Install Oracle HTML DB and Oracle HTTP Server:

1. Use *Oracle Database Installation Guide* to install Oracle Database.
2. Use *Oracle Database Companion CD Installation Guide* to install Oracle HTML DB and Oracle HTTP Server.

The following components are available on the Oracle Database Companion CD installation media:

- JPublisher
- Natively Compiled Java Libraries
- Oracle Database Examples
- Oracle HTML DB
- Oracle HTTP Server
- Oracle Workflow server and middle-tier components

- Oracle Text Supplied Knowledge Bases

If you only need to install these products using the default settings into a new Oracle home, consider using *Oracle Database Companion CD Quick Installation Guide*.

How do I automate and streamline my processes for both traditional applications-based workflow and as e-business integration workflow?

Install Oracle Workflow:

1. Use *Oracle Database Installation Guide* to install Oracle Database.
2. Use *Oracle Database Companion CD Installation Guide* to install Oracle Workflow.

Which Web server can my Oracle applications use?

Install Oracle HTTP Server:

1. Use *Oracle Database Installation Guide* to install Oracle Database.
2. Use *Oracle Database Companion CD Installation Guide* to install Oracle HTTP Server.

How do I migrate my non-Oracle applications to Oracle Database?

Use Oracle Migration Workbench to migrate your non-Oracle applications to Oracle. Oracle Migration Workbench software and documentation are available at:

<http://www.oracle.com/technology/migration/index.html>

Installing Oracle Database Heterogeneous Connectivity Tools (Gateways)

- [How can my AS/400 application access data in an Oracle database?](#)
- [How can my Oracle applications access data in a non-Oracle database system?](#)

How can my AS/400 application access data in an Oracle database?

Use Oracle Access Manager for AS/400, which enables AS/400 applications to access data in an Oracle database. To install Oracle Access Manager for AS/400, see *Oracle Access Manager for AS/400 Installation and User's Guide for IBM iSeries OS/400*.

How can my Oracle applications access data in a non-Oracle database system?

Use the following connectivity tools to enable Oracle applications to access data in non-Oracle databases:

- **Oracle Transparent Gateway:** Integrates a non-Oracle database into your Oracle Database environment.
- **Oracle Procedural Gateway:** 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 Transparent Gateway for DRDA on the Solaris computer where DB2 is running, on Linux where Oracle is running, or on a third computer.

[Table A-1](#) lists the non-Oracle database systems that you can access from Oracle applications, and the Gateway products that are available for those systems.

Table A–1 Oracle Gateway Products

Non-Oracle Database	Oracle Gateway Products and Documentation
IBM DB2 Universal Database (UDB)	<p>Transparent Gateway for DRDA. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Linux x86: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Linux Itanium: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Microsoft Windows (32-bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ IBM zSeries Based Linux: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>.
IBM DB2 z/OS	<p>Transparent Gateway for DB2. Available on z/OS. Use <i>Oracle Transparent Gateway for DB2 Installation and User's Guide for IBM z/OS (OS/390)</i>.</p> <p>Transparent Gateway for DRDA. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Linux x86: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Linux Itanium: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Microsoft Windows (32-bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ IBM zSeries Based Linux: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>.
IBM DB2/400	<p>Transparent Gateway for DB2/400. Available on IBM AS/ 400. Use <i>Oracle Transparent Gateway for DB2/400 Installation and User's Guide for IBM iSeries OS/400</i>.</p> <p>Transparent Gateway for DRDA. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Linux x86: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Linux Itanium: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ Microsoft Windows (32-bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ IBM zSeries Based Linux: Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway for DRDA Installation and User's Guide for UNIX</i>.

Table A-1 (Cont.) Oracle Gateway Products

Non-Oracle Database	Oracle Gateway Products and Documentation
IBM MQSeries	Procedural Gateway for WebSphere MQ. Available on the following platforms: <ul style="list-style-type: none"> ■ Linux x86: Use <i>Oracle Procedural Gateway for WebSphere MQ Installation and User's Guide for UNIX</i>. ■ Microsoft Windows (32-bit): Use <i>Oracle Procedural Gateway for WebSphere MQ Installation and User's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Procedural Gateway for WebSphere MQ Installation and User's Guide for UNIX</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Procedural Gateway for WebSphere MQ Installation and User's Guide for UNIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Procedural Gateway for WebSphere MQ Installation and User's Guide for UNIX</i>.
Adabas Advantage CA-Datcom/DB Advantage CA-IDMS Advantage CA-IDMS/SQL FOCUS IMS/DB-DL/1 ISAM Model 04 QSAM Supra System 2000 TOTAL VSAM	Transparent Gateway for iWAY. Available on z/OS. Use <i>Oracle Transparent Gateway for iWay Installation and User's Guide for IBM z/OS (OS/390)</i> .
Advantage CA-IDMS/DC Transaction Server CICS/TS IMSTM	Procedural Gateway for APPC. Available on the following platforms: <ul style="list-style-type: none"> ■ Linux x86: Use <i>Oracle Procedural Gateway for APPC Installation and Configuration Guide for UNIX</i>. ■ Microsoft Windows (32-bit): Use <i>Oracle Procedural Gateway for APPC Installation and Configuration Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Procedural Gateway for APPC Installation and Configuration Guide for UNIX</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Procedural Gateway for APPC Installation and Configuration Guide for UNIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Procedural Gateway for APPC Installation and Configuration Guide for UNIX</i>.
Microsoft SQL Server	Transparent Gateway for SQL Server. Available on Microsoft Windows (32-Bit). Use <i>Oracle Transparent Gateway Installation Guide for Microsoft Windows (32-Bit)</i> , and then <i>Oracle Transparent Gateway for Microsoft SQL Server Administrator's Guide for Microsoft Windows</i> .

Table A-1 (Cont.) Oracle Gateway Products

Non-Oracle Database	Oracle Gateway Products and Documentation
Sybase Adaptive Server	<p>Transparent Gateway for Sybase. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Microsoft Windows (32-bit): Use <i>Oracle Transparent Gateway Installation Guide for Microsoft Windows (32-Bit)</i>, then <i>Oracle Transparent Gateway for Sybase Administrator's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Sybase Administrator's Guide for Solaris Operating System (SPARC 64-Bit)</i>. ■ AIX 5L Based Systems (64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, and then <i>Oracle Transparent Gateway for Sybase Administrator's Guide for IBM AIX</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Sybase Administrator's Guide for hp-ux</i>. ■ hp Tru64 UNIX: Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Sybase Administrator's Guide for hp Tru64 UNIX</i>.
Teradata	<p>Transparent Gateway for Teradata. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Microsoft Windows (32-bit): Use <i>Oracle Transparent Gateway Installation Guide for Microsoft Windows (32-Bit)</i>, then <i>Oracle Transparent Gateway for Teradata Administrator's Guide for Microsoft Windows</i>. ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Teradata Administrator's Guide for Solaris Operating System (SPARC 64-Bit)</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Teradata Administrator's Guide for hp-ux</i>.
Informix Server	<p>Transparent Gateway for Informix. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Informix Administrator's Guide for Solaris Operating System (SPARC 64-Bit)</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Informix Administrator's Guide for hp-ux</i>.
Ingres II	<p>Transparent Gateway for Ingres II. Available on the following platforms:</p> <ul style="list-style-type: none"> ■ Solaris Operating System (SPARC 64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Ingres II Administrator's Guide for Solaris Operating System (SPARC 64-Bit)</i>. ■ hp-ux PA-RISC (64-Bit): Use <i>Oracle Transparent Gateway Installation Guide for Solaris Operating System, hp-ux, IBM AIX, and hp Tru64 UNIX</i>, then <i>Oracle Transparent Gateway for Ingres II Administrator's Guide for hp-ux</i>.
Rdb	<p>Transparent Gateway for Rdb. Available on hp OpenVMS Alpha. Use <i>Oracle Transparent Gateway Installation Guide for hp OpenVMS</i>, then <i>Oracle Transparent Gateway for Rdb Administrator's Guide for hp OpenVMS</i>.</p>
RMS	<p>Transparent Gateway for RMS. Available on hp OpenVMS Alpha. Use <i>Oracle Transparent Gateway Installation Guide for hp OpenVMS</i>, then <i>Oracle Transparent Gateway for RMS Administrator's Guide for hp OpenVMS</i>.</p>

Optimal Flexible Architecture

This appendix describes the Optimal Flexible Architecture (OFA) standard:

- [Overview of the Optimal Flexible Architecture Standard](#)
- [Changes to the Optimal Flexible Architecture for Oracle Database 10g](#)
- [Directory Tree Differences by Release](#)
- [Optimal Flexible Architecture Directory Naming Conventions](#)
- [Optimal Flexible Architecture and Multiple Oracle Home Configurations](#)
- [Increasing Reliability and Performance](#)
- [Comparison Between Optimal Flexible Architecture on Windows and UNIX](#)

Overview of the Optimal Flexible Architecture Standard

The Optimal Flexible Architecture standard is a set of file naming and configuration guidelines created to ensure reliable Oracle installations that require little maintenance.

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 Optimal Flexible Architecture standard is designed to:

- Organize large amounts of complicated software and data on disk, to avoid device bottlenecks and poor performance
- Facilitate routine administrative tasks such as software and data backup, which are often vulnerable to data corruption
- Facilitate switching among multiple Oracle databases
- Adequately manage and administer database growth
- Help eliminate fragmentation of free space in the data dictionary, isolate other fragmentation, and minimize resource contention

You can think of Optimal Flexible Architecture as a set of good habits to adopt when organizing Oracle directories and files on your computer. All Oracle components on the installation media are Optimal Flexible Architecture-compliant; that is, Oracle Universal Installer places Oracle components in directory locations that follow Optimal Flexible Architecture guidelines. Although using Optimal Flexible Architecture is not a requirement, Oracle recommends that you use it if your database will grow in size, or if you plan to have multiple databases.

The goal of Optimal Flexible Architecture is to prevent an entire class of problems that can occur when you have different releases of Oracle software and multiple, growing databases on your computer.

Oracle Universal Installer separates Oracle software executables from database files. Previously, database files were placed in `ORACLE_HOME\database`, a subdirectory of the Oracle home directory that also contained Oracle software.

Using Optimal Flexible Architecture, Oracle Universal Installer puts Oracle software in `ORACLE_BASE\ORACLE_HOME` and database files in `ORACLE_BASE\oradata`. When you upgrade a database to the latest release, the new Oracle software executables will be placed in a different Oracle home directory. After you judge the upgrade as successful, you can remove the old Oracle home directory and reclaim space, because the database does not reside there.

Characteristics of an Optimal Flexible Architecture-Compliant Installation

An Optimal Flexible Architecture-compliant database has the following characteristics:

- Independent subdirectories
Categories of files are separated into independent subdirectories so that files in one category are minimally affected by operations on files in other categories.
- Consistent naming conventions for database files
Database files are easily distinguishable from all other files. Files of one database are easily distinguishable from files of another database. Data files, **redo log files**, and **control files** are easily identifiable. Data files are clearly associated with a particular **tablespace**.
- Integrity of Oracle home directories
You can add, move, or delete Oracle home directories without having to revise applications that refer to them.
- Separation of administrative information for each database
The ability to distinguish administrative information about one database from that of another ensures a reasonable structure for the organization and storage of administrative data.
- Separation of tablespace contents
Tablespace free space fragmentation and I/O request contention are minimized, while administrative flexibility is maximized.
- Tuning I/O loads across all disks
I/O loads are tuned across all disks, including disks storing Oracle data in raw devices, if needed.

Changes to the Optimal Flexible Architecture for Oracle Database 10g

For previous releases of Oracle Database, the Optimal Flexible Architecture recommended Oracle home path was similar to the following:

```
c:\> oracle\ora92
```

In Oracle Database 10g release 1 (10.1), the Optimal Flexible Architecture recommended Oracle home path changed. The Optimal Flexible Architecture recommended path is now similar to the following:

```
c:\> oracle\product\10.2.0\type_n
```

In this example, *type* is the type of Oracle home, for example Oracle Database (*database*) or Oracle Database Client (*client*), and *n* is an optional counter. This syntax provides the following benefits:

- You can install different products with the same release number in the same Oracle base directory, for example:

```
c:\> oracle\product\10.2.0\db_1
c:\> oracle\product\10.2.0\client_1
```

- You can install the same product more than once in the same Oracle base directory, for example:

```
c:\> oracle\product\10.2.0\db_1
c:\> oracle\product\10.2.0\db_2
```

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](#)

Top-Level Oracle Directory

In an Oracle8i release 8.1.3 or earlier release, all subdirectories are located under a top-level *ORACLE_HOME* directory that by default is `c:\orant`.

When you install an Oracle8i release 8.1.4 or later Optimal Flexible Architecture-compliant database, all subdirectories are no longer under a top-level *ORACLE_HOME* directory. There is now a new top-level Oracle base directory of the form *DRIVE_LETTER*:`\oracle\product\10.2.0`, where *DRIVE_LETTER* is any hard drive.

The Oracle base directory contains `\ORACLE_HOME` directories, `\oradata` directories (for database files), `\flash_recovery_area` (for recovery operations), and `\admin` directories (for database administration files).

Database File Names

In Oracle8i release 8.1.3 and earlier releases, database files have the SID in the database file name. For example, the first control file is named `ctl1SID.ora`.

Beginning with Oracle8i release 8.1.4, database files no longer have the SID in the database file name. For example, the first control file is named `control01.ctl`. There is no need for the presence of the SID in the file name, because all the database files for a particular database are placed in `\oradata` under a directory called *DB_NAME* that is named for that database.

Database File Name Extensions

In Oracle8i release 8.1.3 and earlier releases, all database files have the same `.ORA` extension.

In an Optimal Flexible Architecture-compliant release, the convention of having `.ora` as the filename extension for database files is no longer used. Database filenames now have more meaningful extensions. These are:

- `.ctl` for control files
- `.log` for log files
- `.dbf` for data files

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](#)
- [ADMIN Directory](#)
- [ORADATA Directory](#)
- [FLASH_RECOVERY_AREA Directory](#)

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 *SYSTEM_DRIVE*:`\oracle\product\10.2.0`.

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 will 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 will be a conflict of Oracle base directories. If you create another *ORACLE_BASE* when the original *ORACLE_BASE* already exists, then certain tools and the database will not be able to find previously created files. They will 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

ORACLE_HOME Directory

The `\ORACLE_HOME` directory is located under *SYSTEM_DRIVE*:`\ORACLE_BASE`, where *SYSTEM_DRIVE* 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 Oracle home directory that you create is called `\db_1`.

ADMIN Directory

Database administration files are stored in subdirectories of *ORACLE_BASE*:`\admin\DB_NAME`. Names and brief descriptions of some of these subdirectories are:

```

\bdump      --background process trace files
\cdump      --core dump files
\create     --database creation files
\exp        --database export files
\pfile     --initialization parameter files
\udump     --user SQL trace files

```

ORADATA Directory

Database files are stored in `ORACLE_BASE\oradata\DB_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 only on UNIX platforms. See ["Support for Symbolic Links on Windows"](#) on page B-10.

FLASH_RECOVERY_AREA Directory

The `flash_recovery_area` directory stores and manages files related to backup and recovery. It contains a subdirectory for each database on the system. A flash 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 flash recovery area automatically.

See Also: *Oracle Database Backup and Recovery Basics* to learn how to create and use a flash recovery area

Optimal Flexible Architecture and Multiple Oracle Home Configurations

The following sections describe various Optimal Flexible Architecture and multiple Oracle homes configurations.

Specifying an ORACLE_HOME Directory

To install an Optimal Flexible Architecture-compliant database, you must specify an Oracle home directory in the Path field of Oracle Universal Installer. It is of the form:

```
SYSTEM_DRIVE:\[PATHNAME]\oracle\product\10.2.0\ORACLE_HOME
```

where:

- `SYSTEM_DRIVE:` \ is any hard drive. For example, `c:` \
- `PATHNAME` is an optional directory path name.

- `\oracle` is a mandatory directory path name, unless you changed the value of registry key `ORACLE_BASE` before performing the installation.
- `ORACLE_HOME` is the name of the Oracle home.

The following are examples of Optimal Flexible Architecture-compliant Oracle home directories:

- `c:\test\oracle\product\10.2.0\db_1`
- `d:\oracle\product\10.2.0\db_1`

Installing a Default Optimal Flexible Architecture Database: Example

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 make sure that you accept the default settings for the Oracle home (for example, `c:\oracle\ora81`).
2. Install any Oracle Database in a second Oracle home accepting the default settings.

Table B-1 shows the default Optimal Flexible Architecture database settings.

Table B-1 Default Optimal Flexible Architecture Database Settings

Setting	Value
<code>ORACLE_BASE</code>	<code>c:\oracle\product\10.2.0</code> (same for all Oracle homes)
Oracle home 1	<code>c:\oracle\product\10.2.0\db_1</code>
Oracle home 2	<code>c:\oracle\product\10.2.0\db_2</code>

Installing a Nondefault Optimal Flexible Architecture Database: Example 1

In this example, you install Oracle Database so that each Oracle home has its own 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`).
2. Install any Oracle Database (for example, Oracle Database 10g release 1 (10.2)) in a second Oracle home and change the default Oracle Universal Installer settings for the second Oracle home (for example, from `X:\xyz` to `Y:\abc`).

Table B-2 shows the nondefault Optimal Flexible Architecture database settings for example 1.

Table B-2 Nondefault Optimal Flexible Architecture Database Settings: Example 1

Directory	Value
<code>ORACLE_BASE</code>	<code>X:\xyz</code> for first Oracle home; <code>Y:\abc</code> for second Oracle home
Oracle home 1	<code>X:\xyz</code>
Oracle home 2	<code>Y:\abc</code>

The resulting directory tree would look similar to this:

```
X:\xyz                                -- Oracle home 1
```

```

\admin
  \DB_NAME1
  \DB_NAME2
\bin
\network
\oradata
  \DB_NAME1
    CONTROL01.CTL
    CONTROL02.CTL
    CONTROL03.CTL
    EXAMPLE01.DBF
    SYSAUX01.DBF
    SYSTEM01.DBF
    TEMP01.DBF
    USERS01.DBF
    REDO01.LOG
    REDO02.LOG
    REDO03.LOG
  \DB_NAME2
Y:\abc -- Oracle home 2
  \admin
    \DB_NAME1
    \DB_NAME2
  \bin
  \network
  \oradata
    \DB_NAME1
      CONTROL01.CTL
      CONTROL02.CTL
      CONTROL03.CTL
      EXAMPLE01.DBF
      SYSAUX01.DBF
      SYSTEM01.DBF
      TEMP01.DBF
      USERS01.DBF
      REDO01.LOG
      REDO02.LOG
      REDO03.LOG
    \DB_NAME2

```

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_NAME1
    \adhoc
    \bdump
    \cdump
    \create
    \exp
    \pfile
    \udump
  \DB_NAME2
  \...
  \oradata
    \DB_NAME1
      CONTROL01.CTL
      CONTROL02.CTL
      CONTROL03.CTL
      EXAMPLE01.DBF
      SYSAUX01.DBF
      SYSTEM01.DBF
      TEMP01.DBF
      USERS01.DBF
      REDO01.LOG
      REDO02.LOG
      REDO03.LOG
    \DB_NAME2

```

Increasing Reliability and Performance

One of the goals of Optimal Flexible Architecture is to increase reliability and performance by distributing I/O loads across different physical drives. Two ways to do that are:

- [Disk Mirroring](#)
- [Disk Striping](#)

Disk Mirroring

You can separate and treat Oracle Database log files and database files with different levels of hardware reliability. Oracle Database log files are highly reliable because they

are stored redundantly. Creating similar reliability for database files may require you to duplicate all of your data, using disk mirrors.

Disk mirroring usually involves two or more identical drives and either a hardware controller or Windows Disk Administrator. If one disk fails, then the other disks can recover data that would otherwise be lost. Using one of the disks to recover lost data may involve "breaking" the mirror. When the mirror breaks, you must build a new mirror.

Disk mirroring is part of some levels of Redundant Array of Independent Disks (RAID) configurations, provided by the disk controller. The RAID level determines the amount of redundancy. Some RAID levels can use the "hot swapping" feature, which means that you can replace a bad disk with a good one without turning off the computer or losing functionality.

Disk Striping

How you set up disks for use in a database depends on the number of disks and the type of hard disk controllers available. If the hard disk controllers support both striping and mirroring, then Oracle recommends you configure the controllers to support striping.

You can configure some controllers at system startup time by issuing a keyboard sequence that brings up configuration programs written by the controller manufacturer. One goal is to stripe as many drives together as possible by configuring the controllers. Each stripe shows up as one logical device.

Striping provides significant performance advantages. All the space from the striped drives appears as a single logical drive. Furthermore, the space is used by interlacing "stripes" of space from all of the disks in the stripe. This means that a large file uses some space from the first disk, then some from the second disk and so on to the last disk, and then starting back at the first disk again. Each file can be spread over all of the striped disks. Multiple CPUs can access data randomly in such a file without contention.

Controllers that support striping usually provide caching as well. This means that data can be written to the controller, and cached and saved for a time in storage not on the disk. Data that is read can be cached on the controller in a similar fashion. Read caching should not be used with Oracle Database, because all database reads are cached already in the [System Global Area](#) (SGA). The value of parameter `DB_CACHE_SIZE` in the initialization parameter file (`init.ora`) determines the buffer size that can be used in the SGA. This value also configures Oracle Database on startup.

Note:

- Read caching should be disabled.
 - Disk write caching should be disabled on disks containing Oracle data files and redo log files where the contents of the write cache are not flushed to disk on power failures or operating system failure. Consult your vendor documentation for additional information.
-
-

Using Raw Partitions for Tablespaces

A raw partition is a portion of a physical disk that is accessed at the lowest possible level. I/O of a raw partition improves performance by approximately 5 percent to 10

percent compared to I/O of a partition containing a file system. Therefore, Oracle encourages you to use **raw partitions** for your tablespace files.

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 with regard to 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

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.

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.

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.

Windows currently does not support symbolic links, so data files will not show up under a single directory as with UNIX. Instead, you may have `oradata` directories on multiple drives, with data files in each one. This way, you get Optimal Flexible Architecture benefits, even though data files are not all visible in a single directory.

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_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:\oracle\product\10.2.0 --First logical drive
  \db_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
      \adhoc --Ad hoc SQL scripts
      \adump --Audit files
      \bdump --Background process trace files
      \cdump --Core dump files
      \create --Database creation files
      \exp --Database export files
      \pfile --Initialization parameter file
      \udump --User SQL trace files

f:\oracle\product\10.2.0 --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:\oracle\product\10.2.0 --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:\oracle\product\10.2.0 --Fourth logical drive
  \oradata --Subtree for Oracle Database files
    \prod --Subtree for prod database files
      CONTROL02.CTL --Control file 2

```

Installing and Configuring Oracle Database Using Response Files

This appendix describes how to use response files to perform silent or noninteractive 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](#)

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.

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.
- **Noninteractive (or suppressed) mode:** Oracle Universal Installer only displays screens for which you did not supply information in the response file. You can use variables in the response file or command-line prompts to suppress other Oracle Universal Installer screens, such as Welcome and Summary, that do not prompt for information. To use noninteractive 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 noninteractive installation by entering values for the variables listed in the response file. For instance, to specify the Oracle home name, you would supply the appropriate value for the `ORACLE_HOME_NAME` variable, as in the following example:

```
ORACLE_HOME_NAME="OraDBHome1"
```

Another way of specifying the response file's variable settings is to pass them as command line arguments when you run Oracle Universal Installer. For example:

```
SYSTEM_DRIVE:\setup.exe_location> setup -silent "ORACLE_HOME_NAME=OraDBHome1" ...
```

This method is particularly useful if you do not want to embed sensitive information, such as passwords, in the response file. For example:

```
SYSTEM_DRIVE:\setup.exe_location> setup -silent "s_dlgRBOPassword=binks342" ...
```

Ensure that you enclose the variable and its setting in quotes.

See Also: *Oracle Universal Installer and OPatch User's Guide* for more information about response file formats.

Reasons for Using Silent Mode or Noninteractive Mode

Table C-1 describes several reasons why you might want to run Oracle Universal Installer in silent mode or noninteractive mode.

Table C-1 *Reasons for Using Silent Mode or Noninteractive Mode*

Mode	Uses
Silent	<p>Use silent mode if you want to:</p> <ul style="list-style-type: none"> ■ Complete an unattended installation ■ Complete several similar installations on multiple systems without user interaction <p>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.</p>
Noninteractive	<p>Use noninteractive mode if you want to complete similar Oracle software installations on more than one system, providing default answers to some, but not all, of Oracle Universal Installer prompts.</p> <p>If you do not specify information required for a particular Installer screen in the response file, Oracle Universal Installer displays that screen. It suppresses screens for which you have provided all of the required information.</p>

General Procedure for Using Response Files

You follow these general steps to install Oracle Database using response files:

1. If you plan to use Automatic Storage Management and need to configure new disks, you need to 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:

- ["Step 3: Creating DAS or SAN Disk Partitions for an ASM Instance"](#) on page 2-19
- ["Step 4: Manually Configuring Disks for Automatic Storage Management"](#) on page 2-20

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 using record mode.
"Preparing a Response File" on page C-3 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 noninteractive mode.
"Running Oracle Universal Installer Using the Response File" on page C-5 explains how to run Oracle Universal Installer with a response file.

Preparing a Response File

This section describes the methods that you can use to prepare a response file for use during silent-mode or noninteractive-mode installations:

- [Editing a Response File Template](#)
- [Recording a Response File](#)

Editing a Response File Template

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.

Creating a response file using a response file template is most useful for the Enterprise Edition or Standard Edition installation types.

[Table C-2](#) lists the available sample response files:

Table C-2 *Response Files*

Response File Name	This File Silently Runs The...
<code>enterprise.rsp</code>	Enterprise Edition installation type of Oracle Database
<code>standard.rsp</code>	Standard Edition installation type of Oracle Database
<code>personal.rsp</code>	Personal Edition installation type of Oracle Database
<code>custom.rsp</code>	Custom installation type of Oracle Database
<code>dbca.rsp</code>	Oracle Database Configuration Assistant
<code>netca.rsp</code>	Oracle Net Configuration Assistant
<code>emca.rsp</code>	Enterprise Manager Configuration Assistant

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.

In addition to editing settings specific to the Oracle Database installation, check that the `FROM_LOCATION` path is correct and points to the `products.xml` file in the `stage` directory in the installation media. You may want to set this variable to point to an absolute path, for example:

```
FROM_LOCATION=" \\myserver\database\stage\products.xml "
```

Remember that you can specify sensitive information, such as passwords, at the command line rather than within the response file. "[How Response Files Work](#)" on page C-1 explains this method.

See Also: *Oracle Universal Installer and OPatch User's Guide* for detailed information on creating response files. In an installed Oracle Database, select **Start**, then **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.

Recording a Response File

You can create a response file by running Oracle Universal Installer in interactive mode using record mode. This method is most useful for custom or software-only installations.

Recording the response file generates the response file immediately after you complete the Summary window, so you do not need to install Oracle Database to create the response file. After you create the response file in this manner, you can customize it to meet your needs.

If you want to use record mode during a noninteractive mode installation, Oracle Universal Installer records the variable values that were specified in the original source response file into the new response file.

Note: You cannot use record mode to create a response file based on the Basic installation type.

To record a response file:

1. Ensure that the computer on which you are creating the response file has met the requirements described in [Chapter 2](#).
2. At the command prompt, use the `cd` command to change to the directory that contains the Oracle Universal Installer `setup.exe` executable.

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. Enter the following command:

```
SYSTEM_DRIVE:\setup.exe_location> setup -record -destinationFile response_file_name
```

Replace `response_file_name` with the complete path name for the new response file. For example:

```
SYSTEM_DRIVE:\setup.exe_location> setup -record -destinationFile c:\response_files\install_oracle10_2.rsp
```

4. After Oracle Universal Installer starts, enter the installation settings, which will be recorded in the response file.
5. When the Summary window appears, do one of the following:
 - Click **Install** to create the response file and continue with the installation.

- Click **Cancel** if you only want to create the response file but not continue with the installation. The installation will stop, but the settings you have entered will be recorded in the response file.

Afterwards, Oracle Universal Installer saves your new response file using the path and file name you specified on the command line.

6. Edit the new response file to have any environment-specific changes for the computer on which you will run it.

In addition to editing settings specific to the Oracle Database installation, check that the `FROM_LOCATION` path is correct and points to the `products.xml` file in the `stage` directory in the installation media. You may want to set this variable to point to an absolute path, for example:

```
FROM_LOCATION="\\myserver\database\response\stage\products.xml"
```

Remember that you can specify sensitive information, such as passwords, at the command line rather than within the response file. "[How Response Files Work](#)" on page C-1 explains this method.

7. Run the response file by following the instructions in the "[Running Oracle Universal Installer Using the Response File](#)" section, next.

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. 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:

```
SYSTEM_DRIVE:\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. For example:

```
SYSTEM_DRIVE:\setup.exe_location> setup [-silent] "variable=setting"
[-nowelcome] [-noconfig] [-nowait] -responseFile filename
```

where:

- *filename*: Identifies the full path of the response file.
- `-silent`: Runs Oracle Universal Installer in silent mode and suppresses the Welcome window. When you use `-silent`, then the `-nowelcome` option is not necessary.
- `"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.
- `-nowelcome`: Suppresses the Welcome window that appears during installation.

- `-noconfig`: Suppresses running the configuration assistants during installation, performing a software-only installation instead.
- `-nowait`: Closes the console window when the silent installation completes.

See Also:

- "Installing Oracle Products" in *Oracle Universal Installer and OPatch User's Guide* for more information about installing using response files
- "Deinstalling Products" in *Oracle Universal Installer and OPatch User's Guide* for more information about deinstalling using response files

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.

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:

1. At a command prompt, set the `ORACLE_HOME` environment variable to specify the correct Oracle home directory, for example:

```
c:\> set ORACLE_HOME = c:\oracle\product\10.2.0\db_1
```

2. 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_BASE\ORACLE_HOME\bin> netca /silent /responsefile /local_dir\netca.rsp
```

For example:

```
c:\> ORACLE_BASE\ORACLE_HOME\bin> netca /silent /responsefile /c:\oracle_response_files\mynetca.rsp
```

Running Oracle Database Configuration Assistant Using a Response File

You can run Oracle Database Configuration Assistant in silent or noninteractive mode to configure and start an Oracle database on your system. To run Oracle Database Configuration Assistant in silent or noninteractive mode, use the `dbca.rsp` response file.

To create a 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:

1. At a command prompt, set the `ORACLE_HOME` environment variable to specify the correct Oracle home directory, for example:

```
c:\> set ORACLE_HOME = c:\oracle\product\10.2.0\db_1
```

2. Run Oracle Database Configuration Assistant in silent or noninteractive mode using the following syntax:

```
c:\ORACLE_BASE\ORACLE_HOME\bin> dbca {-progressOnly | -silent} [-cloneTemplate]
[-datafileDestination /datafilepath] -responseFile /local_dir/dbca.rsp
```

where:

- `-silent` runs Oracle Database Configuration Assistant in silent mode
- `-progressOnly` runs Oracle Database Configuration Assistant in noninteractive mode
- `-cloneTemplate` lets you create one of the following preconfigured databases:
 - General purpose
 - Transaction processing
 - Data warehouse
- `-datafileDestination` specifies the parent directory where you want to create the database files. By default, this directory is `ORACLE_BASE\ORACLE_HOME\oradata`.
- `/local_dir` is the full path of the directory where you copied the `dbca.rsp` response file template.

For example:

```
c:\> ORACLE_BASE\ORACLE_HOME\bin> dbca -progressOnly -cloneTemplate -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. For information about the list of options supported, enter the following command:

```
c:\> ORACLE_BASE\ORACLE_HOME\bin\dbca -help
```

Configuring Oracle Database Globalization Support

This appendix describes the following Globalization Support topics:

- [Installing and Using Oracle Components in Different Languages](#)
- [Configuring Locale and Character Sets with the NLS_LANG Parameter](#)

Installing and Using Oracle Components in Different Languages

This section describes the following features:

- [Running Oracle Universal Installer in Different Languages](#)
- [Using Oracle Components in Different Languages](#)

Running Oracle Universal Installer in Different Languages

Oracle Universal Installer runs by default in the selected language of your operating system. You can run Oracle Universal Installer in the following additional languages:

- Brazilian Portuguese
- German
- Japanese
- Simplified Chinese
- Traditional Chinese
- French
- Italian
- Korean
- Spanish

To run Oracle Universal Installer in a different language:

1. Change the language in which your operating system is running: From the **Start** menu, select **Settings**, then **Control Panel**. In the Control Panel, select **Regional and Language Options**.
2. Run Oracle Universal Installer by following the instructions in the "[Installing the Oracle Database Software](#)" section on page 3-7.

Note: The selected language is assigned to the NLS_LANG registry parameter.

Using Oracle Components in Different Languages

You can select other languages in which to use Oracle components (such as Oracle Net Configuration Assistant and Oracle Database Configuration Assistant). Note that this does *not* change the language in which Oracle Universal Installer is run. For the Oracle component to run in the selected language, it must be the same as the language set for your operating system. You can change your operating system language in the Regional Settings window from the Control Panel.

To use components in different languages:

1. Follow the instructions in the "[Installing the Oracle Database Software](#)" section on page 3-7 to start Oracle Universal Installer.
2. In the Select Installation Type window, click the **Product Languages** button.
The Language Selection window appears.
3. Select a language in which to use Oracle components from the **Available Languages** field.
4. Use the arrow (>) to move the language to the **Selected Languages** field, and click **OK**.
5. Select the appropriate products for your installation and click **Next**.

After the installation is complete, the dialog box wording, messages, and online Help for the installed components will display in the language that you selected.

Configuring Locale and Character Sets with the NLS_LANG Parameter

This section covers the following topics:

- [About the NLS_LANG Parameter](#)
- [Default Values for NLS_LANG](#)
- [NLS_LANG Settings in MS-DOS Mode and Batch Mode](#)

About the NLS_LANG Parameter

Oracle provides Globalization Support that enables users to interact with a database in their preferred locale and character set settings, as defined by the NLS_LANG parameter. When you install Oracle Database components, Oracle Universal Installer sets the NLS_LANG parameter in the registry.

The locale setting of your operating system determines the value of the NLS_LANG parameter at installation. [Table D-1](#) lists the operating system locale and NLS_LANG value mappings.

The NLS_LANG parameter is stored in the registry under the HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOMEID\NLS_LANG subkey, where *ID* is the unique number identifying the Oracle home.

The NLS_LANG parameter uses the following format:

`NLS_LANG = LANGUAGE_TERRITORY.CHARACTER_SET`

where:

- *LANGUAGE*: Specifies the language and conventions for displaying messages, day name, and month name.
- *TERRITORY*: Specifies the territory and conventions for calculating week and day numbers.
- *CHARACTER_SET*: Specifies the encoding of the database client, which is the character set for data entered or displayed by a client program.

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 3.1 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 a fatal 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 will terminate parsing and raise an exception.

See Also:

- *Oracle Database Platform Guide for Microsoft Windows (x64)* 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

Default Values for NLS_LANG

Table D-1 lists the default NLS_LANG values for various Windows locales.

Table D-1 NLS_LANG Parameter Values

Operating System Locale	NLS_LANG Value
Arabic (U.A.E.)	ARABIC_UNITED ARAB EMIRATES.AR8MSWIN1256
Bulgarian	BULGARIAN_BULGARIA.CL8MSWIN1251
Catalan	CATALAN_CATALONIA.WE8MSWIN1252
Chinese (PRC)	SIMPLIFIED CHINESE_CHINA.ZHS16GBK
Chinese (Taiwan)	TRADITIONAL CHINESE_TAIWAN.ZHT16MSWIN950
Croatian	CROATIAN_CROATIA.EE8MSWIN1250
Czech	CZECH_CZECH REPUBLIC.EE8MSWIN1250
Danish	DANISH_DENMARK.WE8MSWIN1252
Dutch (Netherlands)	DUTCH_THE NETHERLANDS.WE8MSWIN1252
English (United Kingdom)	ENGLISH_UNITED KINGDOM.WE8MSWIN1252

Table D-1 (Cont.) NLS_LANG Parameter Values

Operating System Locale	NLS_LANG Value
English (United States)	AMERICAN_AMERICA.WE8MSWIN1252
Estonian	ESTONIAN_ESTONIA.BLT8MSWIN1257
Finnish	FINNISH_FINLAND.WE8MSWIN1252
French (Canada)	CANADIAN_FRENCH_CANADA.WE8MSWIN1252
French (France)	FRENCH_FRANCE.WE8MSWIN1252
German (Germany)	GERMAN_GERMANY.WE8MSWIN1252
Greek	GREEK_GREECE.EL8MSWIN1253
Hebrew	HEBREW_ISRAEL.IW8MSWIN1255
Hungarian	HUNGARIAN_HUNGARY.EE8MSWIN1250
Icelandic	ICELANDIC_ICELAND.WE8MSWIN1252
Indonesian	INDONESIAN_INDONESIA.WE8MSWIN1252
Italian (Italy)	ITALIAN_ITALY.WE8MSWIN1252
Japanese	JAPANESE_JAPAN.JA16SJIS
Korean	KOREAN_KOREA.KO16MSWIN949
Latvian	LATVIAN_LATVIA.BLT8MSWIN1257
Lithuanian	LITHUANIAN_LITHUANIA.BLT8MSWIN1257
Norwegian	NORWEGIAN_NORWAY.WE8MSWIN1252
Polish	POLISH_POLAND.EE8MSWIN1250
Portuguese (Brazil)	BRAZILIAN_PORTUGUESE_BRAZIL.WE8MSWIN1252
Portuguese (Portugal)	PORTUGUESE_PORTUGAL.WE8MSWIN1252
Romanian	ROMANIAN_ROMANIA.EE8MSWIN1250
Russian	RUSSIAN_RUSSIA.CL8MSWIN1251
Slovak	SLOVAK_SLOVAKIA.EE8MSWIN1250
Spanish (Spain)	SPANISH_SPAIN.WE8MSWIN1252
Swedish	SWEDISH_SWEDEN.WE8MSWIN1252
Thai	THAI_THAILAND.TH8TISASCII
Spanish (Mexico)	MEXICAN_SPANISH_MEXICO.WE8MSWIN1252
Spanish (Venezuela)	LATIN_AMERICAN_SPANISH_VENEZUELA.WE8MSWIN1252
Turkish	TURKISH_TURKEY.TR8MSWIN1254
Ukrainian	UKRAINIAN_UKRAINE.CL8MSWIN1251
Vietnamese	VIETNAMESE_VIETNAM.VN8MSWIN1258

NLS_LANG Settings in MS-DOS Mode and Batch Mode

Before you can use Oracle utilities such as SQL*Plus, SQL Loader, Import, and Export in MS-DOS mode, make sure that you have set the character set field of the NLS_LANG parameter for the session to the correct value.

This is required because MS-DOS mode uses, with a few exceptions, a different character set (or code-page) from Windows (ANSI code-page), and the default Oracle

home NLS_LANG parameter in the registry is always set to the appropriate Windows code-page. If you do not set the NLS_LANG parameter for the MS-DOS mode session correctly, incorrect character conversion can corrupt error messages and data.

For Japanese, Korean, Simplified Chinese, and Traditional Chinese, the MS-DOS code-page is identical to the ANSI code-page. In this case, you do not need to set the NLS_LANG parameter in MS-DOS mode.

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.

[Table D-2](#) lists the Oracle character sets that correspond to the MS-DOS mode for various operating system locales.

Table D-2 Oracle Character Sets for Operating System Locales

Operating System Locale	Character Set
Arabic	AR8ASMO8X
Catalan	WE8PC850
Chinese (PRC)	ZHS16GBK
Chinese (Taiwan)	ZHT16MSWIN950
Czech	EE8PC852
Danish	WE8PC850
Dutch	WE8PC850
English (United Kingdom)	WE8PC850
English (United States)	US8PC437
Finnish	WE8PC850
French	WE8PC850
German	WE8PC850
Greek	EL8PC737
Hungarian	EE8PC852
Italian	WE8PC850
Japanese	JA16SJIS
Korean	KO16MSWIN949
Norwegian	WE8PC850
Polish	EE8PC852
Portuguese	WE8PC850
Romanian	EE8PC852
Russian	RU8PC866
Slovak	EE8PC852
Slovenian	EE8PC852
Spanish	WE8PC850
Swedish	WE8PC850
Turkish	TR8PC857

See Also: "Globalization Support in the Directory" in *Oracle Internet Directory Administrator's Guide* for Oracle Internet Directory Globalization Support issues and required NLS_LANG environment variables for the various components and tools in an Oracle Internet Directory environment

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 Console Ports](#)
- [Changing the iSQL*Plus Ports](#)
- [Changing the Oracle XML DB Ports](#)

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 make sure 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.

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_BASE\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.

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 SQL*Net Listener Allows Oracle client connections to the database over the Oracle SQL*Net protocol. You can configure this port number during installation. To reconfigure this port, use Net Configuration Assistant.	1521	1521	TCP
Oracle Data Guard Shares the SQL*Net port and is configured during installation. To reconfigure this port, use Net Configuration Assistant to reconfigure the Oracle SQL*Net listener.	1521 (same value as the listener)	1521	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 Management 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-4 explains how to modify its port number	3938	1830–1849	HTTP
Oracle Enterprise Manager Database Control HTTP port for Enterprise Manager Database Control. It is configured during installation. "Changing the Oracle Enterprise Manager Database Console Ports" on page E-4 explains how to modify its port number.	1158	5500–5519	TCP/HTTP
Oracle Enterprise Manager Database Console RMI port for Enterprise Manager Database Control. It is configured during installation. "Changing the Oracle Enterprise Manager Database Console Ports" on page E-4 explains how to modify its port number.	5520	5520–5539	TCP

Table E-1 (Cont.) Ports Used in Oracle Components

Component and Description	Default Port Number	Port Range	Protocol
Enterprise Manager Database Console JMS port for Enterprise Manager Database Control. It is configured during installation. " Changing the Oracle Enterprise Manager Database Console Ports " on page E-4 explains how to modify its port number.	5540	5540–5559	TCP
iSQL*Plus HTTP port for iSQL*Plus. The port number is automatically assigned during installation. " Changing the iSQL*Plus Ports " on page E-4 explains how to change its port number.	5560	5560–5579	TCP/HTTP
iSQL*Plus RMI port for iSQL*Plus. The port number is automatically assigned during installation. " Changing the iSQL*Plus Ports " on page E-4 explains how to change its port number.	5580	5580–5599	TCP
iSQL*Plus JMS port for iSQL*Plus. The port number is automatically assigned during installation. " Changing the iSQL*Plus Ports " on page E-4 explains how to change its port number.	5600	5600–5619	TCP
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. " Changing the Oracle XML DB Ports " on page E-5 explains how to change its port number.	Dynamic	Dynamic	HTTP
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. " Changing the Oracle XML DB Ports " on page E-5 explains how to change its port number.	Dynamic	Dynamic	FTP
Oracle Services for Microsoft Transaction Server The port number for Microsoft Transaction Server is configured when you enter its value in Oracle Universal Installer during a Custom installation the first time you install it on a particular computer. If you install it in multiple Oracle homes on the same computer, Oracle Universal Installer uses the same port number that you specified during the first installation. In most cases, you do not need to reconfigure the port number. If you need to, you can edit its value in the HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\OracleMTSRecoveryService\Protid_0 Registry Editor key.	2030	2030	TCP
Oracle Clusterware Oracle Cluster Ready Services Daemon (CRS daemon) internode connection. The port number is assigned automatically during installation. You cannot view or modify it afterward.	49896	49896	TCP

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_BASE\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
```

Changing the Oracle Enterprise Manager Database Console 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_BASE\ORACLE_HOME\host_sid\sysman\config\emd.properties` file.
- **RMI port:** Search for the `port` attribute in the `rmi-server` tag in the `ORACLE_BASE\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_BASE\ORACLE_HOME\oc4j\j2ee\OC4J_DBConsole_host_sid\config\jms.xml` file.

To change the Oracle Enterprise Manager Database Console ports, use the `emca -reconfig ports` command:

```
ORACLE_BASE\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
```

Changing the iSQL*Plus Ports

The following sections describe how to change the *iSQL*Plus* ports.

Changing the HTTP Port

To change the HTTP port, edit the following files:

- `ORACLE_BASE\ORACLE_HOME\host_sid\sysman\config\emoms.properties`

Modify the following `port` parameters (for example, 5560) in the file:

```
oracle.sysman.db.isqlplusUrl=http://host.domain\:5560/isqlplus/dynamic
oracle.sysman.db.isqlplusWebDBAUrl=http://host.domain\:5560/isqlplus/dynamic
```

- `ORACLE_BASE\ORACLE_HOME\oc4j\j2ee\sqlplus\config\http-web-site.xml`

Modify the port attribute of the web-site element:

```
<web-site port="5560" ...>
```

Changing the RMI Port

To change the RMI port, modify the port attribute of the rmi-server element in the `ORACLE_BASE\ORACLE_HOME\oc4j\j2ee\sqlplus\config\rmi.xml` file:

```
<rmi-server port="5580" ...>
```

Changing the JMS Port

To change the JMS port, modify the port attribute of the jms-server element in the `ORACLE_BASE\ORACLE_HOME\oc4j\j2ee\sqlplus\config\jms.xml` file:

```
<jms-server port="5600" ...>
```

Changing the Oracle XML DB Ports

To change the Oracle XML DB FTP and HTTP ports, you need to run the `catxdbdbca.sql` script, which in a default installation is located in `ORACLE_BASE\ORACLE_HOME\rdbms\admin`.

To change the Oracle XML DB ports:

1. Check that the Oracle listener is running. To do so, in the Windows **Services** utility, make sure that the Oracle TNS Listener service (for example, `OracleOraDb10g_home1TNSListener`) is set to **Started**.

If you cannot start the listener, see *Oracle Database Net Services Administrator's Guide*.

2. Log in to SQL*Plus or iSQL*Plus as SYS or XDB using the SYSDBA role.

For example, to log into SQL*Plus as SYS using the password `welcome`:

```
SYSTEM_DRIVE:> sqlplus sys/welcome as sysdba
```

3. Run the `catxdbdbca.sql` script.

For example, to use 2200 for the FTP port and 8200 for the HTTP port, and assuming your Oracle home is in the following location, enter the following command:

```
SQL> @c:\oracle\product\10.20.0\db_1\rdbms\admin\catxdbdbca.sql 2200 8200
```

4. Exit SQL*Plus or iSQL*Plus.

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 or Noninteractive Installation Response File Error Handling](#)
- [Troubleshooting Configuration Assistants](#)
- [Cleaning Up After a Failed Installation](#)

See Also: [Chapter 6, "Removing Oracle Database Software"](#)

Verifying Requirements

Before you try any of the troubleshooting steps in this appendix, do the following:

- Check [Chapter 2, "Oracle Database Preinstallation Requirements"](#) to make sure 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/technology/index.html>

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 or Noninteractive Installation 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-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
```

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 or Noninteractive Installation Response File Error Handling](#) on page F-2

Silent or Noninteractive Installation Response File Error Handling

To determine whether a silent or noninteractive 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 or noninteractive installation fails if:

- You do not specify a response file.
- You specify an incorrect or incomplete response file.

For example, a common problem is that while all the product-specific data is filled out correctly, the staging area location may be incorrect. If this is the case, check the `FROM_LOCATION` variable and make sure that it points to the `products.xml` file in the installation media. In the installation media, this `products.xml` is in `database\stage`.

- Oracle Universal Installer encounters an error, such as insufficient disk space.

Oracle Universal Installer or a configuration assistant validates the response file at runtime. If the validation fails, the silent or noninteractive installation or configuration process ends. Oracle Universal Installer treats values for parameters that are of the wrong context, format, or type as if no value was specified in the file.

See Also: ["Reviewing the Log of an Installation Session"](#) on page F-2 for information about interactive installation log files

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\ORACLE_HOME\cfgtoollogs` directory. Try to fix the issue that caused the error.
- If you see the Fatal Error. Reinstall message, look for the cause of the problem by reviewing the log files. See ["Fatal Errors"](#) on page F-3 for more information.

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 `installActionsdate_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

Fatal Errors

If you receive a fatal 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-3.
2. Correct the cause of the fatal error.
3. Reinstall the Oracle software.

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 [Chapter 6, "Removing Oracle Database Software"](#) to run Oracle Universal Installer to deinstall Oracle Database, manually remove the Oracle directory, and remove Oracle from the Registry Editor keys. Afterward, reinstall the software.

Glossary

ASM disk group

A set of disk devices that **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 ASM disk group when you create the **ASM instance**, or with Oracle Database Configuration Assistant.

ASM instance

The Oracle instance that manages ASM disk groups **ASM disk groups**. It is created automatically when you install and configure **Automatic Storage Management**. See also Oracle system identifier (**SID**).

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 8.0, or version 7 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 username/password@connect_identifier
```

control files

Files that record the physical structure of a database and contain the database name, the names and locations of associated databases 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.mycompany.com
```

where `sales` is the name you want to call your database and `us.mycompany.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 Installation Types" on page 1-2 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_BASE\ORACLE_HOME\network\admin` directory.

An Oracle Database 10g release 1 (10.2) does not require identification of the database service because of service registration. However, static service configuration is required for an Oracle Database 10g release 1 (10.2) 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/password@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)

operating system authenticated connections

Windows login credentials that can be used to authenticate users connecting to an Oracle Database. The benefits of Windows native authentication include:

- Enabling users to connect to multiple Oracle Databases without supplying a user name or password
- Centralizing Oracle Database user authorization information in Windows, which frees Oracle database from storing or managing user passwords

OPSS

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 and password. 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, `OPSS` was the default setting.

ORACLE_BASE

`ORACLE_BASE` is the root of the Oracle Database directory tree. If you install an OFA-compliant database using Oracle Universal Installer defaults, then `ORACLE_BASE` is `X:\oracle\product\10.2.0` where `X` is any hard drive (for example, `C:\oracle\product\10.2.0`).

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 Context

The root of a directory subtree with a relative distinguished name of `cn=OracleContext`, under which all Oracle software information is kept. There may

be one (or more than one) Oracle Context in a directory. An Oracle Context can be associated with a directory naming context.

The Oracle Context can contain the following Oracle entries:

- Connect identifiers for use with Oracle Net Services directory naming to make database connections
- Enterprise user security for use with Oracle Advanced Security

Oracle home

The directory path in which to install Oracle components (for example, C:\oracle\product\10.2.0\db_n). You are prompted to enter an Oracle home in the Path field of the Specify File Locations window. See also [ORACLE_HOME](#), [Oracle home name](#).

Oracle home name

The name of the current Oracle home, for example, Db_1. Each Oracle home has a home name that distinguishes it from all other Oracle homes on your computer. During installation, you are prompted to enter an Oracle home name in the Name field on the Specify File Locations window.

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 Documentation Library

The media in your kit that includes the Oracle Database documentation. The Oracle Documentation Library is separate from the installation media.

The Oracle Documentation Library does not include this installation guide or *Oracle Database Release Notes for Microsoft Windows (32-Bit)*. These documents are included on the media labeled Oracle Database 10g Release 2 (10.2) and are available on Oracle Technology Network (OTN).

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** does not need to be configured with this static information.

Service registration provides the listener with the following information:

- Service name(s) for each running instance of the database
- Instance name(s) 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.mycompany.com) until you reach eight characters or enter a period. You can accept or change the default value.

The SID can also refer to an ASM instance SID, available when you install **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_BASE\ORACLE_HOME\network\admin`.

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_BASE\ORACLE_HOME\network\admin`.

UNC

See [Universal Naming Convention \(UNC\)](#)

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.

Universal Naming Convention (UNC)

Provides a means to access files on a network without mapping the network drive to a drive letter. UNC names are constructed in the following manner:

`\\computer name\share name\filename`

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