

# Oracle® Database Installation Guide



12c Release 2 (12.2) for Microsoft Windows

E85707-02

March 2018

The Oracle logo, consisting of a solid red square with the word "ORACLE" in white, uppercase, sans-serif font centered within it.

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Oracle Database Installation Guide, 12c Release 2 (12.2) for Microsoft Windows

E85707-02

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# Preface

Learn how to install and configure Oracle Database, perform postinstallation tasks, and how to remove the database software.

The following topics are covered:

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

## Audience

<http://docs.oracle.com/en/database/database.html>

This guide is intended for anyone responsible for installing Oracle Database 12c Release 2 (12.2).

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

## Documentation Accessibility

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## Accessing Documentation

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

- [Platform-Specific Documentation](#)
- [Product Documentation](#)

## Platform-Specific Documentation

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

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

<http://docs.oracle.com/en/database/database.html>

## Product Documentation

Product documentation includes information about configuring, using, or administering Oracle products on any platform. The product documentation for Oracle Database 12c Release 2 (12.2) is available in both HTML and PDF formats at:

<http://docs.oracle.com/en/database/database.html>

## Related Documentation

For more information, see these Oracle resources:

- *Oracle Database Concepts*
- *Oracle Database Examples Installation Guide*
- *Oracle Real Application Clusters Installation Guide*
- *Oracle Grid Infrastructure Installation Guide*
- *Oracle Enterprise Manager Cloud Control Basic Installation Guide*
- *Oracle Database Upgrade Guide*
- *Oracle Database 2 Day DBA*

Oracle error message documentation is available only in HTML. If you only have access to the Oracle Database 12c Release 2 (12.2) 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.

To download free release notes, installation documentation, white papers, or other collateral, please visit the following website:

<http://docs.oracle.com/en/database/database.html>



#### See Also:

- *Oracle Database Sample Schemas*
- *Oracle Database Error Messages* for information about Oracle error messages

## Conventions

The following text conventions are used in this document:

Convention	Meaning
<b>boldface</b>	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.



# Changes in this Release for Oracle Database Installation Guide

This guide explains how to install and configure single-instance Oracle Database.

This guide also provides information about Optimal Flexible Architecture, cloning an Oracle home, and how to remove the database software.

- [Changes in Oracle Database 12c Release 2 \(12.2\)](#)
- [Changes in Oracle Database 12c Release 1 \(12.1\)](#)



## See Also:

*[Oracle Database New Features Guide](#)*

## Changes in Oracle Database 12c Release 2 (12.2)

The following are changes in Oracle Database Installation Guide for Oracle Database 12c Release 2 (12.2):

- [New Features](#)
- [Deprecated Features](#)
- [Desupported Features](#)

## New Features

- Simplified Image based Oracle Grid Infrastructure Installation

Starting with Oracle Grid Infrastructure 12c Release 2 (12.2), the Oracle Grid Infrastructure software is available as an image file for download and installation. You must extract the image software into the directory where you want your Grid home to be located, and then run the `gridSetup.bat` script to start the Oracle Grid Infrastructure installation.



## See Also:

[About Image-Based Oracle Grid Infrastructure Installation](#)

- Parallel NFS Support for Direct NFS Client

Starting with Oracle Database 12c Release 2 (12.2), Oracle Direct NFS Client supports parallel NFS. Parallel NFS is an NFSv4.1 option that enables direct client access to file servers, enabling scalable distributed storage.

 **See Also:**

[Creating an oranfstab File for Direct NFS Client](#)

- Direct NFS dispatcher support

Starting with Oracle Database 12c Release 2 (12.2), Oracle Direct NFS Client supports adding a dispatcher or I/O slave infrastructure. For very large database deployments running Direct NFS client, this feature facilitates scaling of sockets and TCP connections to multi-path and clustered NFS storage.

 **See Also:**

[About Direct NFS Client Storage](#)

- Support for Windows Group Managed Service Accounts and Virtual Accounts

Starting with Oracle Database 12c Release 2 (12.2), support of Group Managed Services Account (gMSA) and Virtual Accounts for installing an Oracle Database provides additional options to create and manage database services without passwords. The gMSA is a domain level account that can be used by multiple servers in a domain to run the services using this account. Virtual Accounts are auto-managed.

 **See Also:**

[Windows Group Managed Service Accounts and Virtual Accounts](#)

- Kerberos Authentication for Direct NFS

Starting with Oracle Database 12c Release 2 (12.2), Oracle Database supports Kerberos implementation with Direct NFS communication. This feature solves the problem of authentication, message integrity, and optional encryption over unsecured networks for data exchange between Oracle Database and NFS servers using Direct NFS protocols.

 **See Also:**

[Creating an oranfstab File for Direct NFS Client](#)

- Support for Microsoft Hyper-V Generation 2 Virtual Machines

Hyper-V enables you to create and manage a virtualized computing environment by running multiple operating systems simultaneously on a single computer. Hyper-V enables built-in integration services for supported guest operating

systems to improve integration between a computer and a virtual machine. Microsoft Hyper-V generation 2 virtual machines are now supported.

 **See Also:**

[Microsoft Hyper-V](#)

- AL32UTF8 as the Default Database Character Set

Starting with Oracle Database 12c Release 2 (12.2), the default database character set of a database created from the General Purpose/Transaction Processing or the Data Warehousing template is Unicode AL32UTF8. Oracle recommends that you use Unicode AL32UTF8 as the database character set.

 **See Also:**

[About Character Set Selection During Installation](#)

- Windows Direct NFS Client Supports All the Accepted NFS Path Formats

Starting with Oracle Database 12c Release 2 (12.2), the Windows Direct NFS Client supports all widely accepted NFS path formats including both Windows style and UNIX style NFS paths.

 **See Also:**

[About Direct NFS Client Storage](#)

- Windows Resilient File System

Starting with Oracle Database 12c Release 2 (12.2), Oracle Database is supported on Resilient File System (ReFS). ReFS uses checksums for file metadata, and an allocate-on-write method to update data which minimizes the risk of corruption.

- Postinstallation Configuration of Oracle Software using the `-executeConfigTools` option

Starting with Oracle Database 12c Release 2 (12.2), you can perform postinstallation configuration of Oracle products by running the Oracle Database or Oracle Grid Infrastructure installer with the `-executeConfigTools` option. You can use the same response file created during installation to complete postinstallation configuration.

 **See Also:**

[Postinstallation Configuration Using the ConfigToolAllCommands Script](#)

- Separation of Duty for Administering Oracle Real Application Clusters

Starting with Oracle Database 12c Release 2 (12.2), Oracle Database provides support for separation of duty for administering Oracle Real Application Clusters (RAC) by introducing the SYSRAC administrative privilege that does not require the SYSDBA administrative privilege. SYSRAC, like SYSDG, SYSBACKUP and SYSKM, helps enforce separation of duties and reduce reliance on the use of SYSDBA on production systems. This administrative privilege is the default mode for connecting to the database by the clusterware agent on behalf of the Oracle RAC utilities such as `srvctl`.

 **See Also:**

[About Job Role Separation Operating System Privileges Groups and Users](#)

### New Features for Oracle Automatic Storage Management 12c Release 2 (12.2)

- Automatic Configuration of Oracle ASM Filter Driver
 

Starting with Oracle Database 12c Release 2 (12.2), you can enable and automate the configuration of Oracle ASM Filter Driver (Oracle ASMFDF) with a check box during the Oracle Grid Infrastructure installation.
- Oracle ACFS Snapshot-Based Replication
 

The Oracle Automatic Storage Management Cluster File System (Oracle ACFS) snapshot-based replication feature uses Oracle ACFS snapshot technology to transfer the differences between successive snapshots to the standby file system using standard ssh transport protocol. Oracle ACFS Snapshot-based replication is more efficient with higher performance, lower overhead, and ease of management.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Compression
 

Oracle ACFS provides file system compression functionality, reducing storage requirement, and resulting in lower costs. Oracle ACFS compression is managed using the new `acfsutil compress` commands and updates to the `acfsutil info` command.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Defragger
 

Databases that share storage with snapshots or with the base of the file system can become fragmented under active online transaction processing (OLTP) workloads. This fragmentation can cause the location of the data in the volume to be discontinuous for sequential scans. Oracle ACFS automatically defragments these files in the background.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Support for 4K Sectors

Oracle ACFS supports I/O requests in multiples of 4K logical sector sizes as well as continued support for 512-byte logical sector size I/O requests. The `i4096` option is provided with the `acfsformat` command on Microsoft Windows and the `mkfs` command in Linux and Oracle Solaris environments.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Automatic Resize

Oracle ACFS provides an automatic resize option with the `acfsutil size` command. This command enables you to specify an increment by which an Oracle ACFS file system grows automatically if the amount of available free space in the file system falls below a specified amount. There is also an option to specify the maximum Oracle ACFS plugins support file content data collection. Both polling and interval based capture are supported with the file content `collection.maxSize` allowed when using the automatic resize option. The output of the `acfsutil info fs` command displays the automatic resize increment and maximum amounts.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Metadata Acceleration

Oracle ACFS supports accelerator metadata storage. This support enables many critical Oracle ACFS metadata structures, including extent metadata, storage bitmaps, volume logs, and some snapshot metadata to be placed on accelerator storage.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Plugins for File Content Data Collection

Oracle ACFS plugins support file content data collection. Both, polling and interval based capture are supported with the file content collection.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Sparse Files

Oracle ACFS provides support for sparse files. Oracle ACFS sparse files greatly benefit NFS client write operations, which are commonly received out of order by the NFS server and the associated Oracle ACFS file system.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- Oracle ACFS Scrubbing Functionality

Oracle ACFS provides scrubbing functionality with the `acfsutil scrub` command to check for and report any inconsistencies in the metadata or file data.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

- High Availability Common Internet File System

Release 12.2 enhances Oracle ACFS Common Internet File System (CIFS) features to provide high availability for exported file systems with the Oracle ACFS NAS Maximum Availability eXtensions (NAS MAX) technology. High Availability Common Internet File System (HACIFS) and High Availability Network File System (HANFS), both provide comprehensive Network Attach Storage solutions for Oracle ACFS.

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

## Deprecated Features

The following feature is deprecated in this release, and may be desupported in a future release:

- Deprecation of the `configToolAllCommands` script

Starting with Oracle Database 12c Release 2 (12.2), the `configToolAllCommands` script is deprecated and is subject to desupport in a future release. The `configToolAllCommands` script runs in response file mode to configure Oracle products after installation and uses a separate password response file. To perform postinstallation configuration of Oracle products, you can now run the Oracle Database or Oracle Grid Infrastructure installer with the `-executeConfigTools` option. You can use the same response file created during installation to complete postinstallation configuration.

For a complete list of deprecated features, see:

*Oracle Database Upgrade Guide*

## Desupported Features

The following features are no longer supported by Oracle:

- Oracle Enterprise Manager Database Control
- `CLEANUP_ORACLE_BASE` Property Removed

For a complete list of desupported features, see:

*Oracle Database Upgrade Guide*

## Changes in Oracle Database 12c Release 1 (12.1)

The following are changes in Oracle Database Installation Guide for Oracle Database 12c Release 1 (12.1):

- [New Features](#)
- [Deprecated Features](#)
- [Desupported Features](#)

## New Features

- Oracle Home User Support for Database

Starting with Oracle Database 12c Release 1 (12.1), Oracle Database supports the use of Oracle Home User, which can be specified during installation. The Oracle Home User can be a Windows Built-in Account or a standard Windows User Account (not an Administrator account). This account is used for running Windows services for Oracle home. For enhanced security, Oracle recommends that you use a standard Windows User Account (instead of Windows Built-in Account).

Group Managed Services Account (gMSA) and Virtual Accounts are the new options for Oracle Home User.

### See Also:

- [Recommended File System](#)
- [Configuring Environment Variables for the Software Installation Owner](#)
- [Managing User Accounts with User Account Control](#)
- [Operating System Groups Created During Oracle Database Installation](#)
- [Oracle Database Platform Guide for Microsoft Windows](#)

- Oracle ASM File Access Control on Windows

This feature provides access control to separate the roles on Windows. With Oracle database services running as users rather than Local System, the Oracle ASM access control feature must be enabled to support role separation on

Windows. In the previous releases, this feature was disabled on Windows because all Oracle services ran as a Local System.

 **See Also:**

- *Oracle Database Platform Guide for Microsoft Windows*
- *Oracle Automatic Storage Management Administrator's Guide*
- ["Operating System Groups Created During Oracle Database Installation"](#)
- ["Configuring Storage for Oracle Automatic Storage Management"](#)

- Oracle Flex ASM

Oracle Flex ASM enables an Oracle ASM instance to run on a separate physical server from the database servers. Any number of Oracle ASM servers can be clustered to support much larger number of database clients.

Oracle Database instances can be set up as clients to Oracle Flex ASM where metadata is provided to the database instance by an Oracle Flex ASM instance that is on a different node than the database instance.

Note that Oracle Flex ASM can apply to a collection of databases, each one a single instance but running in a Flex ASM Cluster.

 **See Also:**

- *Oracle Automatic Storage Management Administrator's Guide*

- Deinstallation Tool Integrated with Installation Media

 **See Also:**

- ["About Oracle Deinstallation Options"](#)
- *Oracle Database Upgrade Guide*

- Simplified Oracle Label Security Installation

 **See Also:**

- ["Configuring Oracle Label Security"](#)
- *Oracle Label Security Administrator's Guide*

- Simplified Oracle Database Vault Installation
- Unified Database Audit Configuration



Starting with Oracle Database 12c Release 1 (12.1), you can create named audit policies. An audit policy contains a set of audit options and it is stored in the database as an object. The advantage of creating a named audit policy is that it reduces the number of commands that are required to create a database audit policy, and it simplifies the implementation of an audit configuration for security and compliance with conditional auditing.

This new audit policy framework is included with the database installation.

 **See Also:**

*Oracle Database Security Guide*

- Oracle Enterprise Manager Database Express 12c
- Support for Separation of Database Administration Duties

 **See Also:**

- ["About Job Role Separation Operating System Privileges Groups and Users"](#)
- ["Extended Oracle Database Groups for Job Role Separation"](#)
- *Oracle Grid Infrastructure Installation and Upgrade Guide for Microsoft Windows x64 (64-Bit)*
- *Oracle Database Administrator's Guide*
- *Oracle Database Advanced Security Administrator's Guide*

- Oracle DBCA Support for CDBs and PDBs

Starting with Oracle Database 12c Release 1 (12.1), Oracle Database Configuration Assistant (Oracle DBCA) enables you to create either a non-CDB or a multitenant container database (CDB). You can create the CDB with zero, one, or more user-created pluggable databases (PDBs).

You can also create a CDB with one PDB during database installation.

- Support for NFS Version in Direct NFS Client

Starting with Oracle Database 12c Release 1 (12.1), you can specify the NFS protocol version to be used by the Direct NFS Client.

 **See Also:**

["Creating an oranfstab File for Direct NFS Client."](#)

- Configuring the OraClrAgnt Service for Oracle Database Extensions for .NET

Starting with Oracle Database 12c Release 1 (12.1), after installation you use the `OraClrCtl.exe` utility to create, start, stop, and delete the OraClrAgnt service.

**See Also:**

["Configuring the OraClrAgnt Service for Oracle Database Extensions for .NET."](#)

## Deprecated Features

The following features are deprecated in this release, and may be desupported in a future release:

- Deinstallation Tool Integrated with Installation Media
- Deprecation of `-cleanupOBase`

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

- Windows NTS Authentication Using the NTLM Protocol

The NTS authentication adapter no longer supports the use of the NT LAN Manager (NTLM) protocol to authenticate Windows domain users. Thus, the NTS adapter cannot be used to authenticate users in old Windows NT domains or domains with old Windows NT domain controllers. However, local connections and Oracle Database services running as a Windows Local User continues to be authenticated using NTLM. A new client-side `sqlnet.ora` boolean parameter, `no_ntlm` (default value is `FALSE`) enables you to control if NTLM can be used in NTS authentication. When the parameter is set to `TRUE`, NTLM cannot be used in NTS authentication.

For a complete list of deprecated features, see:

*Oracle Database Upgrade Guide*

## Desupported Features

The following features are no longer supported by Oracle:

- Oracle Enterprise Manager Database Control
- `CLEANUP_ORACLE_BASE` Property Removed
- Oracle COM Automation
- Oracle Objects for OLE
- Oracle Counters for Windows Performance Monitor
- Raw Devices

For a complete list of desupported features, see:

*Oracle Database Upgrade Guide*

# 1

## Oracle Database Installation Checklist

Use checklists to review system requirements, and to plan and carry out Oracle Database installation.

Oracle recommends that you use checklists as part of your installation planning process. Using a checklist ensures that your server hardware and configuration meets minimum requirements for this release, and enables you to carry out a successful installation.

- [Server Hardware Checklist for Oracle Database Installation](#)  
Use this checklist to check hardware requirements for Oracle Database.
- [Operating System Checklist for Oracle Database Installation on Microsoft Windows](#)  
Use this checklist to check minimum operating system requirements for Oracle Database.
- [Server Configuration Checklist for Oracle Database Installation](#)  
Use this checklist to check minimum server configuration requirements for Oracle Database installations.
- [Oracle User Environment Configuration Checklist for Oracle Database Installation](#)
- [Storage Checklist for Oracle Database Installation](#)  
Use this checklist to review storage minimum requirements and assist with configuration planning.
- [Creating a Database After Installation](#)  
You can create a database after installation by using Oracle Database Configuration Assistant (Oracle DBCA).

## Server Hardware Checklist for Oracle Database Installation

Use this checklist to check hardware requirements for Oracle Database.

**Table 1-1 Server Hardware Checklist for Oracle Database Installation**

Check	Task
Server Make and Architecture	Confirm that server make, model, core architecture, and host bus adaptors (HBA) or network interface controllers (NIC) are supported to run with Oracle Database and Oracle Grid Infrastructure. Ensure the server has a DVD drive, if you are installing from a DVD.
Minimum RAM	2 GB RAM recommended
Minimum network connectivity	Server is connected to a network
Video Adapter	256 colors
Server Display Cards	At least 1024 x 768 display resolution, which Oracle Universal Installer requires.

# Operating System Checklist for Oracle Database Installation on Microsoft Windows

Use this checklist to check minimum operating system requirements for Oracle Database.

**Table 1-2 Operating System General Checklist for Oracle Database on Microsoft Windows**

Item	Task
Operating system general requirements	<p>Oracle Database for Windows x64 is supported on the following operating system versions:</p> <ul style="list-style-type: none"> <li>Windows 7 x64 - Professional, Enterprise, and Ultimate editions</li> <li>Windows 8 x64 and Windows 8.1 x64 - Pro and Enterprise editions</li> <li>Windows 8.1 x64 - Pro and Enterprise editions</li> <li>Windows 10 x64 - Pro, Enterprise, and Education editions</li> <li>Windows Server 2012 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>Windows Server 2012 R2 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>Windows Server 2016 x64 - Standard, Datacenter, and Essentials editions</li> </ul>

# Server Configuration Checklist for Oracle Database Installation

Use this checklist to check minimum server configuration requirements for Oracle Database installations.

**Table 1-3 Server Configuration Checklist for Oracle Database**

Check	Task
Disk space allocated to the temporary file system	<p>At least 1 GB of space in the temporary directory. Oracle recommends 2 GB or more</p> <p>At least 4 GB of space in the temporary directory for Oracle Restart</p>
Swap space allocation relative to RAM	<ul style="list-style-type: none"> <li>If physical memory is between 2 GB and 16 GB, then set virtual memory to 1 times the size of the RAM</li> <li>If physical memory is more than 16 GB, then set virtual memory to 16 GB</li> </ul>
Oracle Inventory and ORA_INSTALL Group Requirements	<p>The Oracle Inventory directory is the central inventory of Oracle software installed on your system. You do not need to create the Oracle central inventory or the ORA_INSTALL group as Oracle Universal Installer creates it for you.</p>

**Table 1-3 (Cont.) Server Configuration Checklist for Oracle Database**

Check	Task
Groups and Users	Oracle recommends that you create groups and user accounts required for your security plans before starting installation. Installation owners have resource limits settings and other requirements. Group and user names must use only ASCII characters.
Mount point paths for the software binaries	Oracle recommends that you create an Optimal Flexible Architecture configuration as described in the appendix "Optimal Flexible Architecture" in Oracle Database Installation Guide for Microsoft Windows.
Ensure that the Oracle home (the Oracle home path that you select for Oracle Database) uses only ASCII characters.	The ASCII character restriction includes installation owner user names, which are used as a default for some home paths, as well as other directory names you must select for paths.
Set locale (if needed)	Specify the language and the territory, or locale, in which you want to use Oracle components. A locale is a linguistic and cultural environment in which a system or program is running. National Language Support (NLS) parameters determine the locale-specific behavior on both servers and clients. The locale setting of a component determines the language of the user interface of the component, and the globalization behavior, such as date and number formatting.

## Oracle User Environment Configuration Checklist for Oracle Database Installation

Use this checklist to plan operating system users, groups, and environments for Oracle Database management.

**Table 1-4 User Environment Configuration for Oracle Database**

Check	Task
Create operating system groups and users	Create operating system groups and users depending on your security requirements, as described in this install guide.
Configure the Oracle Software Owner Environment	Set the <code>TEMP</code> environment variable.
Unset Oracle Software Environment Variables	If you have had an existing installation on your system, and you are using the same user account to install this installation, then unset the <code>ORACLE_HOME</code> , <code>ORACLE_BASE</code> , <code>ORACLE_SID</code> , <code>TNS_ADMIN</code> environment variables and any other environment variable set for the Oracle installation user that is connected with Oracle software homes.
Manage User Account Control	If you have enabled the User Account Control security feature, then Oracle Universal Installer prompts you for either your consent or your credentials when installing Oracle Database. Provide either the consent or your Windows Administrator credentials as appropriate.

# Storage Checklist for Oracle Database Installation

Use this checklist to review storage minimum requirements and assist with configuration planning.

**Table 1-5 Storage Checklist for Oracle Database**

Check	Task
Minimum local disk storage space for Oracle software	At least 6.0 GB for Oracle Database Enterprise Edition At least 5.5 GB for Oracle Database Standard Edition 2 At least 7.0 GB for an Oracle Restart installation
Select Database File Storage Option	Ensure that you have one of the following storage options available: <ul style="list-style-type: none"> <li>File System Oracle recommends that the file system be separate from the file systems used by the operating system or the Oracle software. The file system can be any of the following: <ul style="list-style-type: none"> <li>- A file system on a disk that is physically attached to the system</li> <li>- A file system on a logical volume manager (LVM) volume or a redundant array of independent disks (RAID) device</li> </ul> </li> <li>Oracle Automatic Storage Management (Oracle ASM) Oracle ASM is installed as part of an Oracle Grid Infrastructure installation. If you plan to use Oracle ASM, then you must install Oracle Grid Infrastructure before you install and create the database.</li> </ul>
Determine your recovery plan	Review the storage configuration sections of this document for more information about configuring recovery.

## Creating a Database After Installation

You can create a database after installation by using Oracle Database Configuration Assistant (Oracle DBCA).

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



**See Also:**

*Oracle Database 2 Day DBA*

# 2

## Oracle Database Preinstallation Tasks

Review the preinstallation tasks before you start Oracle Universal Installer.

Learn about the information required to install Oracle Database 12c. Ensure that you review information related to the platform on which you intend to install Oracle Database 12c.

- [Oracle Database Minimum Hardware Requirements](#)  
Learn about the hardware component and hard disk space requirements.
- [Oracle Database Software Requirements](#)  
The following table lists the software requirements for Oracle Database on Windows x64:
- [Windows Certification and Web Browser Support](#)  
Review the Windows Certification and Web Browser Support information.
- [Reviewing Operating System Security Common Practices](#)  
Secure operating systems are an important basis for general system security.
- [Confirming Host Name Resolution](#)  
Typically, the computer on which you want to install Oracle Database is connected to a network.
- [Individual Component Requirements](#)  
Review the individual component requirements.

### Related Topics

- [Installing Oracle Grid Infrastructure for Oracle Restart for an Existing Database](#)  
Follow the high-level instructions in this section to install Oracle Restart and configure it for an existing Oracle database.
- [Requirements for an Oracle Restart Installation](#)  
Before you install Oracle Restart, ensure that your system meets the following requirements:
- [Oracle Database Minimum Hardware Requirements](#)  
Learn about the hardware component and hard disk space requirements.
- [Oracle Database Software Requirements](#)  
The following table lists the software requirements for Oracle Database on Windows x64:
- [Windows Certification and Web Browser Support](#)  
Review the Windows Certification and Web Browser Support information.
- [Reviewing Operating System Security Common Practices](#)  
Secure operating systems are an important basis for general system security.
- [Confirming Host Name Resolution](#)  
Typically, the computer on which you want to install Oracle Database is connected to a network.

- [Individual Component Requirements](#)  
Review the individual component requirements.



#### See Also:

*Oracle Grid Infrastructure Installation and Upgrade Guide for Microsoft Windows x64 (64-Bit)*

## Oracle Database Minimum Hardware Requirements

Learn about the hardware component and hard disk space requirements.

- [Hardware Component Requirements for Windows x64](#)  
The following table lists the hardware components that are required for Oracle Database on Windows x64.
- [Hard Disk Space Requirements](#)  
Learn about the system requirements for Windows platforms that use the NT File System (NTFS).
- [Verifying Hardware Requirements](#)  
Use this procedure to gather information about your server configuration.

### Hardware Component Requirements for Windows x64

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

**Table 2-1 Windows x64 Minimum Hardware Requirements**

Requirement	Value
System Architecture	Processor: AMD64 and Intel EM64T
Physical memory (RAM)	2 GB minimum
Virtual memory (swap)	<ul style="list-style-type: none"> <li>• If physical memory is between 2 GB and 16 GB, then set virtual memory to 1 times the size of the RAM</li> <li>• If physical memory is more than 16 GB, then set virtual memory to 16 GB</li> </ul>
Disk space	<ul style="list-style-type: none"> <li>• Typical Install Type total: 10 GB</li> <li>• Advanced Install Types total: 10 GB</li> </ul> See <a href="#">Table C-1</a> for details.
Video adapter	256 colors
Screen Resolution	1024 X 768 minimum

#### Related Topics

- [Configuring Disk Storage for Oracle Data Files and Recovery Files](#)  
Learn about the storage options for storing Oracle data files and, optionally, Oracle database recovery files.



- [Creating Directories for Oracle Data Files or Recovery Files](#)  
If you decide to place the Oracle Database files on a file system, then use the following guidelines when deciding where to place them:
- [Configuring Storage for Oracle Automatic Storage Management](#)  
Identify storage requirements and ASM disk group options.
- [Installing with Minimum Memory Requirements](#)  
Installations of Oracle Database on computers with RAM and virtual memory lesser than the minimum required have the following limitations:

## Hard Disk Space Requirements

Learn about the system requirements for Windows platforms that use the NT File System (NTFS).

Oracle strongly recommends that you install the Oracle database home (Oracle database binaries, trace files, and so on) on Oracle ACFS or NTFS.

The database files themselves must be placed on Oracle ASM if using Oracle ACFS; otherwise they can be placed on NTFS. Usage of Oracle ACFS and Oracle ASM or NTFS is recommended to ensure security of these files.

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

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

The following table lists the disk space requirements on NTFS for Windows x64. The starter database requires 720 MB of disk space.

The values in this table include the starter database.

**Table 2-2 Windows x64 Minimum Disk Space Requirements on NTFS**

Installation Type	TEMP Space	SYSTEM_DRIVE:\Program Files\Oracle\Inventory	Oracle Home	Data Files *	Total
Enterprise Edition	595 MB	4.55 MB	6.00 GB	4.38 GB **	10.38 GB **
Standard Edition 2	595 MB	4.55 MB	5.50 GB	4.24 GB **	9.74 GB **

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

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

**See Also:**

*Oracle Database Platform Guide for Microsoft Windows*

## Verifying Hardware Requirements

Use this procedure to gather information about your server configuration.

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

1. Determine the physical RAM size.

For example, on a computer running Windows Server 2012 R2, click **System and Security**, then click **System**.

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

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

For example, on a computer running Windows Server 2012 R2, click **System and Security**, then click **System**, click **Advanced System Settings**, click the **Advanced** tab on System Properties page, and then click **Settings** in the Performance section. Then select the **Advanced** tab on Performance Options page.

The virtual memory is listed in the Virtual Memory section.

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

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

For example, on a computer running Windows Server 2012 R2, right-click **My Computer** and click **Open**.

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

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

For example, to change the environment variables on a computer running Windows Server 2012 R2, click **System and Security**, then click **System**, click **Advanced System Settings**, click the **Advanced** tab on System Properties page, and then click **Environment Variables**.

## Oracle Database Software Requirements

The following table lists the software requirements for Oracle Database on Windows x64:

**Table 2-3 Windows x64 Software Requirements**

Requirement	Value
Operating System	<p>Oracle Database for Windows x64 is supported on the following operating systems:</p> <ul style="list-style-type: none"> <li>• Windows 7 x64 - Professional, Enterprise, and Ultimate editions</li> <li>• Windows 8 x64 and Windows 8.1 x64 - Core, Pro, and Enterprise editions</li> <li>• Windows 8.1 x64 - Pro and Enterprise editions</li> <li>• Windows 10 x64 - Pro, Enterprise, and Education editions</li> <li>• Windows Server 2012 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>• Windows Server 2012 R2 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>• Windows Server 2016 x64 - Standard, Datacenter, and Essentials editions</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Windows Multilingual User Interface Pack is supported.</li> <li>• The Server Core option is not supported.</li> </ul>
Compiler	<p>The following components are supported with the Microsoft Visual C++ 2013 Update 4, Microsoft Visual C++ 2015 Update 3, and Intel 14.0 C compilers:</p> <ul style="list-style-type: none"> <li>• Oracle Call Interface</li> <li>• External callouts</li> <li>• Pro*C/C++</li> <li>• Oracle XML Developer's Kit (XDK)</li> </ul> <p>Oracle C++ Call Interface supports:</p> <ul style="list-style-type: none"> <li>• Microsoft Visual C++ 2013 Update 4</li> <li>• Microsoft Visual C++ 2015 Update 3 - OCCl libraries are installed under <code>ORACLE_HOME\oci\lib\msvc\vc14</code>. When developing OCCl applications with MSVC++ 2015, ensure that the OCCl libraries are correctly selected from this directory for linking and executing.</li> <li>• Intel 14.0 C compilers with Microsoft Visual Studio 2013 STLs</li> </ul> <p>Pro*COBOL supports:</p> <ul style="list-style-type: none"> <li>• Micro Focus Visual COBOL 2.2 - Update 2</li> </ul>
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"> <li>• TCP/IP</li> <li>• TCP/IP with SSL</li> <li>• Named Pipes</li> </ul>

**Table 2-3 (Cont.) Windows x64 Software Requirements**

Requirement	Value
Oracle Database Client	<p>To connect to Oracle Database 12c Release 2 (12.2), the following are required:</p> <ul style="list-style-type: none"> <li>• Oracle Database Client is version 10.2.0.5 or higher.</li> <li>• If the earlier Oracle Database Client is running on the same computer as Oracle Database 12c Release 2 (12.2), then you cannot use a bequeath connection.</li> </ul> <p>Oracle recommends upgrading Oracle Database Client to the latest patchset (10.2.0.5, or 11.2.0.4 or later). You can download the patchset from the Patches and Updates section of My Oracle Support at</p> <p><a href="https://support.oracle.com">https://support.oracle.com</a></p>



**See Also:**

- <https://support.oracle.com> My Oracle Support Note 1563794.1 for more information about Hyper-V support
- [Hardware and Software Certification](#) for information about how to access the latest system requirements

## Windows Certification and Web Browser Support

Review the Windows Certification and Web Browser Support information.

- [Remote Desktop Services](#)  
Oracle supports installing, configuring, and running Oracle Database through Remote Desktop Services, formerly known as Terminal Services, on Windows.
- [Installation Requirements for Web Browsers](#)  
You require Web browsers to use Oracle Enterprise Manager Database Express and Oracle Enterprise Manager Cloud Control.
- [Default Share Configuration Requirement](#)  
The prerequisite checks during Oracle Database installation require that the system drive on your computer has default share configured on it.

## Remote Desktop Services

Oracle supports installing, configuring, and running Oracle Database through Remote Desktop Services, formerly known as Terminal Services, on Windows.

To install Oracle Database, Oracle recommends that you start all configuration tools from the Terminal Server console session of the server (using `mstsc/console`).

Platform-specific support information is as follows:

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

- Windows server operating systems: You can have multiple Remote Desktop sessions.

#### See Also:

- The Microsoft website for more information about Remote Desktop Services  
<http://www.microsoft.com/>
- The My Oracle Support website for the latest Terminal Services and Remote Desktop Services information  
<https://support.oracle.com/>

## Installation Requirements for Web Browsers

You require Web browsers to use Oracle Enterprise Manager Database Express and Oracle Enterprise Manager Cloud Control.

Web browsers must support Java Script, and the HTML 4.0 and CSS 1.0 standards. For a list of browsers that meet these requirements, see the Oracle Enterprise Manager certification matrix on My Oracle Support:

<https://support.oracle.com/CSP/main/article>

#### See Also:

*Oracle Enterprise Manager Cloud Control Basic Installation Guide*

## Default Share Configuration Requirement

The prerequisite checks during Oracle Database installation require that the system drive on your computer has default share configured on it.

Use the `net use` command to verify, for example:

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

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

## Reviewing Operating System Security Common Practices

Secure operating systems are an important basis for general system security.

Ensure that your operating system deployment is in compliance with common security practices as described in your operating system vendor security guide.

## Confirming Host Name Resolution

Typically, the computer on which you want to install Oracle Database is connected to a network.

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

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

If your computer host name does not resolve, then contact your System Administrator.

## Individual Component Requirements

Review the individual component requirements.

Individual Component Requirements contains the following topics:

- [Configuring Disk Storage for Oracle Data Files and Recovery Files](#)  
Learn about the storage options for storing Oracle data files and, optionally, Oracle database recovery files.
- [Creating Directories for Oracle Data Files or Recovery Files](#)  
If you decide to place the Oracle Database files on a file system, then use the following guidelines when deciding where to place them:
- [Oracle Database Security Strong Authentication Requirements](#)  
Ensure that you meet the hardware and software requirements so that you can use strong authentication (Kerberos, PKI) with Oracle Database.
- [Oracle Enterprise Manager Requirements](#)  
All Oracle Enterprise Manager products must belong to the same release.
- [Oracle-Managed Files Requirements](#)  
If you choose the Advanced database creation option, then you can use the Oracle-managed files feature with the new database.
- [Oracle Volume Shadow Copy Service \(VSS\) Writer](#)  
Oracle Volume Shadow Copy Service Writer is supported on Windows Server operating systems.

### See Also:

- *Oracle Application Express Installation Guide*

## Configuring Disk Storage for Oracle Data Files and Recovery Files

Learn about the storage options for storing Oracle data files and, optionally, Oracle database recovery files.

- [Choosing a Storage Option for Oracle Database and Recovery Files](#)  
Oracle Database files include data files, control files, redo log files, the server parameter file, and the password file.
- [Configuring Disk Storage](#)  
Learn how to configure disk storage before you start the installation.

## Choosing a Storage Option for Oracle Database and Recovery Files

Oracle Database files include data files, control files, redo log files, the server parameter file, and the password file.

For all installations, you must choose the storage option to use for Oracle Database files. During the database installation, you must choose the storage option to use for recovery files (the fast recovery area). You do not have to use the same storage option for each file type.

### Note:

Database files and recovery files are supported on file systems and Oracle ASM.

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

## Configuring Disk Storage

Learn how to configure disk storage before you start the installation.

### Related Topics

- [Creating Directories for Oracle Data Files or Recovery Files](#)  
If you decide to place the Oracle Database files on a file system, then use the following guidelines when deciding where to place them:
- [Configuring Storage for Oracle Automatic Storage Management](#)  
You can use SQL Developer to issue SQL and PL/SQL statements. All SQL and PL/SQL commands are supported as they are passed directly from the SQL Worksheet to the Oracle Database.

## Creating Directories for Oracle Data Files or Recovery Files

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

- [Guidelines for Placing Oracle Database Files on a File System or Logical Volume](#)  
Review the guidelines for placing Oracle Database files on a file system or logical volume.

- [Guidelines for Placing Oracle Recovery Files on a File System](#)  
Use the guidelines listed in this section to place Oracle recovery files on a file system.
- [Creating Required Directories](#)  
Use this procedure to create the required directories.

## Guidelines for Placing Oracle Database Files on a File System or Logical Volume

Review the guidelines for placing Oracle Database files on a file system or logical volume.

- Oracle Universal Installer indicates that the default path for the database file directory is a subdirectory of the Oracle base directory.
- You can choose either a single file system or more than one file system to store the database files:
  - If you want to use a single file system, then choose a file system on a physical device that is dedicated to the database.  
  
For best performance and reliability, choose a RAID device or a logical volume on multiple physical devices and implement a stripe-and-mirror everything (SAME) storage policy.
  - If you want to use more than one file system, then choose file systems on separate physical devices that are dedicated to the database.  
  
This method enables you to distribute physical input-output operations and create separate control files on different devices for increased reliability. It also enables you to fully implement Oracle Optimal Flexible Architecture (OFA) guidelines. Choose the Advanced database creation option to implement this method.
- If you intend to create a preconfigured database during the installation, then the file system (or file systems) that you choose must have at least 2 GB of free disk space.  
  
For production databases, you must estimate the disk space requirement depending on the use of the database.
- For optimum performance, the file systems that you choose must be on physical devices that are used only by the database.
- The Oracle user running the Oracle Database installation must have write permissions to create the files in the path that you specify.

## Guidelines for Placing Oracle Recovery Files on a File System

Use the guidelines listed in this section to place Oracle recovery files on a file system.

### Note:

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



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

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

 **Note:**

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

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

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

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

 **See Also:**

*Oracle Database Backup and Recovery User's Guide*

- Oracle Universal Installer suggests that the default location 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

Use this procedure to create the required directories.

 **Note:**

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

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

1. Use Windows Explorer to determine the free disk space on the file system.
2. From the display, identify the file systems to use:

File Type	File System Requirements
Data files	Select one of the following: <ul style="list-style-type: none"><li>• A single file system with at least 950 MB of free disk space</li><li>• Two or more file systems with at least 950 MB of free disk space in total</li></ul>
Recovery files	Choose a file system with at least 2 GB of free disk space.

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

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

#### Related Topics

- [Configuring Storage for Oracle Automatic Storage Management](#)  
Identify storage requirements and ASM disk group options.
- [Stopping Existing Oracle Services](#)  
Learn how to stop all processes, including the listener and database, running in the Oracle home.

## Oracle Database Security Strong Authentication Requirements

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

## Oracle Enterprise Manager Requirements

All Oracle Enterprise Manager products must belong to the same release.

Older versions of Enterprise Manager are not supported with the new release.

#### Note:

Oracle Enterprise Manager products are released on the Enterprise Manager Cloud Control installation media. Oracle Enterprise Manager Database Express is built into Oracle Database without any need for special installation or management.

#### See Also:

*Oracle Enterprise Manager Cloud Control Basic Installation Guide* and  
*Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide*

## Oracle-Managed Files Requirements

If you choose the Advanced database creation option, then you can use the Oracle-managed files feature with the new database.

If you use this feature, then specify only the database object name instead of file names when creating or deleting database files. You require configuration procedures to enable Oracle Managed Files.

 **See Also:**

*Oracle Database Administrator's Guide*

## Oracle Volume Shadow Copy Service (VSS) Writer

Oracle Volume Shadow Copy Service Writer is supported on Windows Server operating systems.

 **See Also:**

*Oracle Database Platform Guide for Microsoft Windows*

# 3

## Overview of Oracle Database Installation

Learn about the different installation types of Oracle Database and issues to consider before you install Oracle Database.

- [New Oracle Products and Features Installed with this Release](#)  
There are many new features and products installed with this release.
- [Planning Your Installation](#)  
The Oracle Database installation process consists of the following steps:
- [Installation Considerations](#)  
Learn about the information that you must consider before deciding how to install this product.
- [Oracle Database Installation Methods](#)  
You can choose the following installation methods to install Oracle Database:
- [Database Configuration Options](#)  
Review the different database configuration options.
- [Database Backup and Recovery Options](#)  
To simplify the management of backup and recovery files, you can create a fast recovery area for your database.
- [Migration Considerations](#)  
Review the migration considerations in this topic.

### New Oracle Products and Features Installed with this Release

There are many new features and products installed with this release.

There are many new New Oracle Products and Features Installed with this Release.

#### Related Topics

- [Changes in this Release for Oracle Database Installation Guide](#)  
This guide explains how to install and configure single-instance Oracle Database.

### Planning Your Installation

The Oracle Database installation process consists of the following steps:

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

<http://docs.oracle.com>

2. **Review the licensing information:** Although the installation media in your media pack contain many Oracle components, you are permitted to use only those components for which you have purchased licenses.  
  
Oracle Support Services does not provide support for components for which licenses have not been purchased.
3. **Plan the installation:** This overview chapter describes the Oracle products that you can install and issues that you must consider before starting the installation.  
  
Oracle Database Client is installed separately. You cannot install Oracle Database Client during an Oracle Database installation.
4. **Complete preinstallation tasks:** [Oracle Database Preinstallation Tasks](#) describes tasks that you must complete before installing Oracle Database. Additionally, see [Installing and Configuring Oracle Grid Infrastructure for a Standalone Server](#) for Oracle Restart preinstallation tasks.
5. **Install the software:** Use the following sections to install Oracle Database:
  - [Installing and Configuring Oracle Grid Infrastructure for a Standalone Server](#) describes how to use Oracle Universal Installer to install Oracle Grid Infrastructure for a standalone server.
  - [Installing Oracle Database](#) describes how to use Oracle Universal Installer to install Oracle Database and how to clone an Oracle home.
  - [Installing and Configuring Oracle Database Using Response Files](#) describes how to perform silent or response file installations, which you may want to use to perform multiple installations of Oracle Database.
  - [Running Oracle Universal Installer in Different Languages](#) describes how to install and use Oracle components in different languages.
  - [Troubleshooting the Oracle Database Installation](#) provides troubleshooting advice in case you encounter problems with the installation.
6. **Complete postinstallation tasks:** [Oracle Database Postinstallation Tasks](#) describes postinstallation tasks.
7. **Get started using Oracle Database:** Use the following sections to get started using Oracle Database:
  - [Getting Started with Oracle Database](#) 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" describes how you can clone an existing Oracle Database home.
  - [Optimal Flexible Architecture](#) on the Optimal Flexible Architecture, which is a set of guidelines that ensure reliable Oracle installations that require little maintenance.
  - [Installing and Using Oracle Components in Different Languages](#) describes globalization support information.
  - [Managing Oracle Database Port Numbers](#) explains how to manage Oracle Database port numbers.
8. **Remove Oracle Database software:** [Removing Oracle Database Software](#) describes how to remove Oracle Database software.

**Related Topics**

- [Frequently Asked Questions About Installation](#)  
Use the following guidelines to decide how to install Oracle Database components:

**Related Topics**

- [Installing and Configuring Oracle Database Using Response Files](#)  
Learn how to install and configure Oracle products using response files.

**See Also:**

*[Oracle Database Licensing Information](#)*

## Installation Considerations

Learn about the information that you must consider before deciding how to install this product.

- [Installation Differences Between Windows and UNIX Systems](#)  
If you are experienced with installing the Oracle components in UNIX environments, note that many manual setup tasks required on UNIX are not required on Windows.
- [Recommended File System](#)  
Describes the recommended file system.
- [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.
- [Oracle Grid Infrastructure for a Standalone Server](#)  
Oracle Grid Infrastructure for a standalone server provides the infrastructure to include your single instance database in an enterprise grid architecture.
- [Oracle Cluster Synchronization Services](#)  
When you install Oracle Restart, Oracle Universal Installer configures the single-node version of Oracle Cluster Synchronization Services (CSS).
- [Oracle Universal Installer Overview](#)  
Oracle Universal Installer is a Java-based graphical user interface (GUI) tool that enables you to install Oracle software.
- [Oracle Base Directory](#)  
If you install Oracle Database 12c on a computer with no other Oracle software installed, Oracle Universal Installer creates an Oracle base directory for you.
- [Oracle Home Directory](#)  
Learn about the Oracle Home directory.
- [Oracle Inventory Directory](#)  
The Oracle Inventory directory is the central inventory location for all Oracle software installed on a server.
- [Installing Oracle Database Vault in an Oracle Data Guard Environment](#)  
Starting with Oracle Database 12c, Oracle Database Vault is installed by default as part of the Oracle Database installation.

- [Oracle Database Vault Default Audit Policy and Initialization Parameters](#)  
Oracle Database Vault installs a baseline database auditing policy.
- [Consider Memory Allocation and Automatic Memory Management](#)  
During a Typical installation, you create your database with Database Configuration Assistant (DBCA), and automatic memory management is enabled. If you choose advanced installation, then you can either specify memory allocation manually, or enable automatic memory management.

## Installation Differences Between Windows and UNIX Systems

If you are experienced with installing the 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, you log in to a user account with Administrator privileges to install the Oracle Database software. You can also specify an Oracle Home User (standard Windows User Account, not an Administrator account) during installation. On Linux and UNIX systems, you must create and use a software owner user account, and this user must belong to the Oracle Inventory group.
- **Environment variables**  
With Windows, Oracle Universal Installer sets environment variables such as `PATH`, `ORACLE_BASE`, `ORACLE_HOME`, and `ORACLE_SID` in the registry. In UNIX systems, you must manually set these environment variables.  
  
If you have multiple Oracle databases in an Oracle home, then only the `SID` of the last Oracle database is set in the registry.
- **Operating System Groups**  
On Windows systems, Oracle Universal Installer creates `ORA_DBA`, `ORA_OPER`, `ORA_SID_DBA`, `ORA_SID_OPER`, `ORA_HOMENAME_DBA`, `ORA_HOMENAME_OPER` and other groups, which are used for operating system authentication for Oracle Database and Oracle ASM instances. On Linux and UNIX systems, you must create these operating system groups manually, and they are used for granting permission to access various Oracle software resources and for operating system authentication.
- **Account for running Oracle Universal Installer**  
With Windows, you log in to a user account with Administrator privileges to install the Oracle Database software. You can also specify an Oracle Home User (standard Windows User Account, not Administrator account) during installation. On Linux and UNIX systems, you must create and use a software owner user account, and this user must belong to the Oracle Inventory group.

### See Also:

*Oracle Universal Installer and OPatch User's Guide for Windows and UNIX* for more information about managing Oracle homes.

## Recommended File System

Describes the recommended file system.

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



### See Also:

*Oracle Database Platform Guide for Microsoft Windows*

## 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 may be certified after this guide is published, review the certification matrix on the My Oracle Support website for the most up-to-date list of certified hardware platforms and operating system versions. This website also provides compatible client and database versions, patches, and workaround information for bugs. The My Oracle Support website is available at

<https://support.oracle.com/>

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

- [Third-Party Database Certification for Oracle SQL Developer](#)  
You can use Oracle SQL Developer to view metadata and data of several non-Oracle databases.

### Related Topics

- [Windows Certification and Web Browser Support](#)  
Review the Windows Certification and Web Browser Support information.

## Third-Party Database Certification for Oracle SQL Developer

You can use Oracle SQL Developer to view metadata and data of several non-Oracle databases.



### See Also:

*Oracle SQL Developer Installation Guide*



## Oracle Grid Infrastructure for a Standalone Server

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

Oracle Database 12c Release 2 (12.2) combines these infrastructure products into one software installation called the Oracle Grid Infrastructure home. On a single instance database, the Oracle Grid Infrastructure home includes Oracle Restart and Oracle Automatic Storage Management (Oracle ASM) software.

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



### See Also:

[Installing and Configuring Oracle Restart](#)

## Oracle Cluster Synchronization Services

When you install Oracle Restart, Oracle Universal Installer configures the single-node version of Oracle Cluster Synchronization Services (CSS).

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

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



### Note:

*Oracle Real Application Clusters Installation Guide*

## Oracle Universal Installer Overview

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

Oracle Universal Installer provides the following capabilities:

- Component and suite installations
- Globalization support
- Distributed installation support
- Unattended silent installations using response files

- Removal of installed components
- Multiple Oracle homes support

Oracle Universal Installer can run a silent or a response file installation of Oracle software using response files.

You must use the Oracle Universal Installer 12c to install components into an Oracle Database 12c Oracle home directory.

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

<https://support.oracle.com/>

When Oracle Universal Installer runs, it creates a *dbhome\_n* directory, which keeps track of the components you are installing. Do not modify the contents of this directory. By default, this directory is located at the same directory level as *ORACLE\_HOME*.

### Related Topics

- [Installing and Configuring Oracle Database Using Response Files](#)  
Learn how to install and configure Oracle products using response files.

## Oracle Base Directory

If you install Oracle Database 12c on a computer with no other Oracle software installed, Oracle Universal Installer creates an Oracle base directory for you.

If Oracle software is installed, then one or more Oracle base directories exist. In the latter case, Oracle Universal Installer offers you a choice of Oracle base directories to install Oracle Database.

The Oracle Home User has complete control over the Oracle base for a particular home. For security reasons, different Windows User Accounts used as Oracle Home Users for different Oracle homes are not allowed to share the same Oracle base. However, to support Oracle Database upgrade, Oracle supports the sharing of an Oracle base between a Windows Built-in Account and a Windows User Account. This means that if you choose to reuse an Oracle base from an earlier release of Oracle Database in Oracle Database 12c, then the Oracle Home User of Oracle Database 12c Oracle home has complete control over the Oracle base of the earlier release.

### See Also:

*Oracle Database Platform Guide for Microsoft Windows*

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

```
DRIVE_LETTER:\app\username
```

where *username* is the Oracle Installation User if you choose Windows Built-in Account, else it is the Oracle Home User (standard Windows User Account).

 **Caution:**

After installing Oracle Database 12c or later with a Windows User Account used as the Oracle Home User, do not install older version of databases and share the same Oracle base directory. During the installation of older releases of Oracle Database, ACLs are reset corresponding to older releases. Thus Oracle Database 12c or later services may not be able to access the Oracle base directory and the files in it.

 **Note:**

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

## Oracle Home Directory

Learn about the Oracle Home directory.

- [Contents of the Oracle Home Environment](#)  
The Oracle home directory is located under the Oracle base directory.
- [Multiple Oracle Home Components](#)  
You can install all Oracle components in multiple Oracle homes on the same computer.

## Contents of the Oracle Home Environment

The Oracle home directory is located under the Oracle base directory.

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

```
DRIVE_LETTER:\app\username\product\12.2.0\dbhome_1
```

where `username` is the installation user if you choose a Windows Built-in Account, else it is the Oracle Home User specified.

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

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

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

## Multiple Oracle Home Components

You can install all Oracle components in multiple Oracle homes on the same computer.

However, some components can only support one active instance at a time. The current (latest) installation renders the previous one inactive. These components are:

- Oracle Administration Assistant for Windows
- Oracle Provider for OLE DB

## Oracle Inventory Directory

The Oracle Inventory directory is the central inventory location for all Oracle software installed on a server.

By default, the location of the Oracle Inventory directory is `C:\Program Files\Oracle\Inventory`. This directory is created by default the first time you install Oracle software on a Windows server.

## Installing Oracle Database Vault in an Oracle Data Guard Environment

Starting with Oracle Database 12c, Oracle Database Vault is installed by default as part of the Oracle Database installation.

If you plan to use Oracle Data Guard with Oracle Database Vault, then see "Integrating Oracle Database Vault with Oracle Data Guard" in *Oracle Database Vault Administrator's Guide*.

## Oracle Database Vault Default Audit Policy and Initialization Parameters

Oracle Database Vault installs a baseline database auditing policy.

This policy covers the access control configuration information stored in the following:

- Database Vault database tables
- Information stored in Oracle Catalog (rollback segments, tablespaces, and so on)
- Use of system privileges
- Oracle Label Security configuration

When you install Oracle Database Vault, the security specific database initialization parameters are initialized with the default values.

### See Also:

*Oracle Database Vault Administrator's Guide*

## Consider Memory Allocation and Automatic Memory Management

During a typical installation, you create your database with Database Configuration Assistant (DBCA), and automatic memory management is enabled. If you choose advanced installation, then you can either specify memory allocation manually, or enable automatic memory management.

With automatic memory management, the Oracle Database instances automatically manage and tune memory for you. With automatic memory management, you choose a memory target, and the instance automatically distributes memory between the system global area (SGA) and the instance program global area (instance PGA). As memory requirements change, the instance dynamically redistributes memory between the SGA and instance PGA.

You can enable automatic memory management either during, or after the database installation. Enabling automatic memory management after installation involves a shutdown and restart of the database.



### See Also:

*Oracle Database Administrator's Guide*

## Oracle Database Installation Methods

You can choose the following installation methods to install Oracle Database:

- [Interactive Installation Types](#)  
Review the different interactive installation methods in this section.
- [Automated Installation Methods Using Response Files](#)  
By creating a response file and specifying this file when you start Oracle Universal Installer, you can automate some or all of the Oracle Database installation.

## Interactive Installation Types

Review the different interactive installation methods in this section.

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

Oracle Universal Installer provides you the following options:

- **Desktop Class:** Select this option if you are installing on a laptop or desktop class system. This option includes a starter database and allows minimal configuration. This option is designed for those who want to quickly set up a database.
- **Server Class:** Select this option if you are installing on a server class system, such as when deploying Oracle in a production data center. This option allows for more advanced configuration options. Advanced configuration options available using this option include Oracle RAC, Oracle Automatic Storage Management, backup

and recovery configuration, integration with Enterprise Manager Cloud Control, and more fine-grained memory tuning, among others.

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

- Typical: Select this installation method to quickly install Oracle Database. This installation type requires minimal user input. It installs the software and optionally creates a general-purpose database using the information that you specify on the screen. It is the default installation type.
- Advanced: Select this installation type to complete any of the following tasks:
  - \* Select a database character set or different product languages
  - \* Create the EXAMPLE tablespace during the installation
  - \* Create a database on a different file system from the software
  - \* Specify different passwords for administrative schemas
  - \* Configure recovery options
  - \* Configure Oracle Configuration Manager
  - \* In the Select Database Edition screen, if you select **Enterprise Edition**, then Oracle Universal Installer automatically selects the components most customers need for their Oracle Database installation.

#### Related Topics

- [Reviewing Component-Specific Installation Guidelines](#)  
Review the following guidelines before starting Oracle Universal Installer:

## Automated Installation Methods Using Response Files

By creating a response file and specifying this file when you start Oracle Universal Installer, you can automate some or all of the Oracle Database installation.

These automated installation methods are useful if you must perform multiple installations on similarly configured systems.

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

- **Silent Mode:** Oracle Universal Installer runs in silent mode if you use a response file that specifies all the required information, and specify the `-silent` option when starting Oracle Universal Installer. None of the Oracle Universal Installer screens are displayed.
- **Response File Mode:** Oracle Universal Installer runs in response file mode if you do not specify all the required information in the response file.

#### Related Topics

- [Installing and Configuring Oracle Database Using Response Files](#)  
Learn how to install and configure Oracle products using response files.

## Database Configuration Options

Review the different database configuration options.

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

- [Creating a Database After Installation](#)  
You can create a database after installation by using Oracle Database Configuration Assistant (Oracle DBCA).

## Creating a Database After Installation

You can create a database after installation by using Oracle Database Configuration Assistant (Oracle DBCA).

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

- [Creating an Oracle Database on Direct NFS](#)  
Learn how to install and create an Oracle Database that uses Direct NFS (dNFS) for storage.



### See Also:

*Oracle Database 2 Day DBA*

## Creating an Oracle Database on Direct NFS

Learn how to install and create an Oracle Database that uses Direct NFS (dNFS) for storage.

There are different configuration processes you must perform to use dNFS for your database file system. Following are the steps:

1. **Perform a Software-Only Installation of Oracle Database**  
In a software-only installation, you install the Oracle Database software but do not create a database as part of the installation process. You can install only the database software by selecting the Install Database Software only option provided on the Select Installation Option screen.
2. **Use Oracle Database Configuration Assistant to Create and Configure the Database**  
After the Prerequisite checks are complete, on the Summary screen, minimize the installation window. **DO NOT** click Finish at this point.
3. **Enable the Direct NFS option.**  
Return to the DBCA window and click **Finish**.
4. **Map a drive letter to a CIFS share on the NFS server that represents the location of the database files.**

```
NET USE * \\filer\vol0\orcl
```

After you complete this step, both Oracle and the Windows operating system can access the location where the database files reside. Oracle is using DNFS, but the Windows OS uses CIFS to access the same location on the NFS server.

5. Verify that the Direct NFS is configured for the database.
  - a. Start SQL\*Plus.
  - b. Connect to the newly created database as a DBA user.
  - c. Run the following SQL command:

```
SELECT * FROM v$dnfs_servers;
```

#### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.
- *Oracle Database 2 Day DBA*

## Database Backup and Recovery Options

To simplify the management of backup and recovery files, you can create a fast recovery area for your database.

During the database installation, Oracle Universal Installer provides you with options to configure the fast recovery area location. However, to configure backups, and to implement a backup and recovery strategy, you must use either Recovery Manager (RMAN) or Oracle Enterprise Manager Cloud Control.

- [Configuring Recovery](#)  
You can provide the location of the fast recovery area during the database installation.

#### See Also:

- *Oracle Database Backup and Recovery User's Guide*
- *Oracle Database 2 Day DBA*

## Configuring Recovery

You can provide the location of the fast recovery area during the database installation.

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



 **See Also:**

[Oracle Database Preinstallation Tasks](#) describes how to choose the location of the fast recovery area and identifies its disk space requirements.

## Migration Considerations

Review the migration considerations in this topic.

You can migrate an existing Oracle Database 11g for 32-bit Windows to Oracle Database 12c for 64-bit Windows.

Oracle Database Upgrade Assistant has an option, Move Database from a Different Release 12.1 Oracle home, which lets you move your database from a Windows Built-in Account secured home to a Windows User Account secured home.

 **See Also:**

- *Oracle Database Upgrade Guide*
- *Oracle Database Platform Guide for Microsoft Windows*
- *Oracle Database Platform Guide for Microsoft Windows about "Migrating an Oracle Database 11g Release 2 (11.2) or Earlier Database"*

# 4

## Configuring Users, Groups and Environments for Oracle Database

Learn about the users, groups, and environment settings to complete before you install Oracle Database and Grid Infrastructure for a standalone server.

- [Creating Required Operating System Groups and Users](#)  
If you are installing Oracle software for the first time and on the products that you are installing, create several operating system groups and users.
- [Stopping Existing Oracle Services](#)  
Learn how to stop all processes, including the listener and database, running in the Oracle home.
- [Configuring User Accounts](#)  
During installation, you can specify an Oracle Home User.



### See Also:

*Oracle Database Platform Guide for Microsoft Windows*

## Creating Required Operating System Groups and Users

If you are installing Oracle software for the first time and on the products that you are installing, create several operating system groups and users.

You can choose to create one administrative user and use one group for operating system authentication for all system privileges on the storage and database tiers. For example, you can designate the `oracle` user to be the Oracle Installation user for all Oracle software and use only the `ORA_DBA` group for authentication. You can also create custom configuration groups and users based on job role separation that divide access privileges.

Log in as an Administrator user, and use the following instructions to create the Oracle Installation user for Oracle Database.

- [About the Oracle Installation User](#)  
To install Oracle Restart or Oracle Database software, you must use either a local or a domain user that is also a member of the Administrators group.
- [Creating Oracle Home User](#)  
During Oracle Database installation, you can specify an optional Oracle home user associated with the Oracle home.
- [Understanding the Oracle Inventory Directory and the Oracle Inventory Group](#)  
The Oracle Inventory directory is the central inventory location for all Oracle software installed on a server.

- [Operating System Groups Created During Oracle Database Installation](#)  
During installation, the user groups listed in the following table are created, if they do not already exist.
- [Operating System Groups and Users for Job Role Separation](#)  
A job role separation configuration of Oracle Database and Oracle ASM is a configuration with groups and users to provide separate groups for operating system authentication.



#### See Also:

*Oracle Database Platform Guide for Microsoft Windows*

## About the Oracle Installation User

To install Oracle Restart or Oracle Database software, you must use either a local or a domain user that is also a member of the Administrators group.

This user is the Oracle Installation User. The Oracle Installation User can be either a local user or a domain user.

## Creating Oracle Home User

During Oracle Database installation, you can specify an optional Oracle home user associated with the Oracle home.

For example, assume that you use an Administrator user named `OraSys` to install the software (Oracle Installation user), then you can specify the `ORADOMAIN\OraDb` domain user as the Oracle home user for this installation. The specified Oracle home domain user must exist before you install the Oracle Database software.

Oracle home user can be a Windows Built-in Account (LocalSystem for Server and LocalService for Client), Virtual Account, or a regular (not an administrator) Windows account. If you specify an existing user as the Oracle home user, then the Windows User Account you specify can either be a Windows Domain User or a Windows Local User.

A Windows User Account need not be created by the Administrator if a Virtual Account or a Windows Built-in Account is used during installation.

If you specify a non-existing user as the Oracle home user, then the Windows User Account you specify must be a Windows Local User. The installer creates this account automatically to run the Windows services for the Oracle home. Do not log in using this account to perform administrative tasks.

Starting with Oracle Database 12c Release 2 (12.2), the Group Managed Services Account (gMSA) and Virtual Accounts enables you to install Oracle Database, and create and manage Database services without passwords. The gMSA is a domain level account that can be used by multiple servers in a domain to run the services using this account. Windows User Account can be a Windows Local User, Windows Domain User, Managed Services Account (MSA), or Group Managed Services Account (gMSA).

If you want to create a new user during installation, then it can only be a Windows Local User. It cannot be a Windows Domain User, an MSA, or a gMSA. The new user that is created is denied interactive logon privileges to the Windows computer. However, a Windows administrator can manage this account like any other Windows account. Oracle recommends that you use Virtual Account or a standard Windows User Account (instead of Windows Built-in Account) as the Oracle Home User for enhanced security.

 **Note:**

You cannot change the Oracle Home User after the installation is complete. If you must change the Oracle Home User, then you must reinstall the Oracle Database software.

When you specify an Oracle Home user, the installer configures that user as the Oracle Service user for all software services that run from the Oracle home. The Oracle Service user is the operating system user that the Oracle software services run as, or the user from which the services inherit privileges.

Silent installation is enhanced to support password prompt for the Oracle home user. So, customers and independent software vendors (ISV) can use response files without hard coding the password into the source code.

Oracle recommends using Virtual Account or a standard Windows User Account (not an Administrator account) as the Oracle Home User for typical installation, software-only installation, and cloning.

If an existing Windows User Account is used as the Oracle home user for software-only installation, then a password is not required. Thus, you can perform a silent, software-only installation using Windows User Account.

If you use a Windows User Account as the Oracle home user for cloning individual Oracle Database installations, then a password is not required.

Virtual Account is the Oracle home user for Oracle Database Single Instance database installation. The account enables you to install Oracle Database, create, and manage Database services without passwords. The gMSA is a domain level account that can be used by multiple servers in a domain to run the services using this account. The gMSA is a low privilege user account.

## Understanding the Oracle Inventory Directory and the Oracle Inventory Group

The Oracle Inventory directory is the central inventory location for all Oracle software installed on a server.

By default, the location of the Oracle Inventory directory is `C:\Program Files\Oracle\Inventory`.

When you install Oracle software on the system for the first time, Oracle Universal Installer creates the directories for the Oracle central inventory and the Oracle Inventory group, `ORA_INSTALL`. The `ORA_INSTALL` group contains all the Oracle Home Users for all Oracle homes on the server.

Whether you are performing the first installation of Oracle software on this server, or are performing an installation of additional Oracle software on the server, you do not need to create the Oracle central inventory or the `ORA_INSTALL` group; the Oracle Universal Installer creates them automatically. You cannot change the name of the Oracle Inventory group - it is always `ORA_INSTALL`.

## Operating System Groups Created During Oracle Database Installation

During installation, the user groups listed in the following table are created, if they do not already exist.

The `HOMENAME` variable refers to the generated `HOMENAME` for a software installation, which is of the form `OraproductmajorVersionHomename`. For example, `OraDB12cHome1`.

**Table 4-1 User Groups Created During Oracle Database Installation**

Operating System Group Name	Related System Privilege	Description
<code>ORA_DBA</code>	<code>SYSDBA</code> system privileges for all Oracle Database installations on the server	A special <code>OSDBA</code> group for the Windows operating system. Members of this group are granted <code>SYSDBA</code> system privileges for all Oracle Databases installed on the server.
<code>ORA_OPER</code>	<code>SYSOPER</code> system privileges for all Oracle databases installed on the server	A special <code>OSOPER</code> group for the Windows operating system. Members of this group are granted <code>SYSOPER</code> system privileges all Oracle Databases installed on the server. This group does not have any members after installation, but you can manually add users to this group after the installation completes.
<code>ORA_ASMADMIN</code>	<code>SYSASM</code> system privileges for Oracle ASM administration	The <code>OSASM</code> group for the Oracle ASM instance. Using this group and the <code>SYSASM</code> system privileges enables the separation of <code>SYSDBA</code> database administration privileges from Oracle ASM storage administration privileges. Members of the <code>OSASM</code> group are authorized to connect using the <code>SYSASM</code> privilege and have full access to Oracle ASM, including administrative access to all disk groups that the Oracle ASM instance manages.
<code>ORA_ASMDBA</code>	<code>SYSDBA</code> system privileges on the Oracle ASM instance	The <code>OSDBA</code> group for the Oracle ASM instance. This group grants access for the database to connect to Oracle ASM. During installation, the Oracle Installation Users are configured as members of this group. After you create an Oracle Database, this group contains the Oracle Home Users of those database homes.

**Table 4-1 (Cont.) User Groups Created During Oracle Database Installation**

Operating System Group Name	Related System Privilege	Description
ORA_ASMOPER	SYSOPER for ASM system privileges	The OSOPER group for the Oracle ASM instance. Members of this group are granted SYSOPER system privileges on the Oracle ASM instance, which permits a user to perform operations such as startup, shutdown, mount, dismount, and check disk group. This group has a subset of the privileges of the OSASM group. Similar to the ORA_HOMENAME_OPER group, this group does not have any members after installation, but you can manually add users to this group after the installation completes.
ORA_HOMENAME_DBA	SYSDBA system privileges for all instances that run from the Oracle home with the name <i>HOMENAME</i>	An OSDBA group for a specific Oracle home with a name of <i>HOMENAME</i> . Members of this group can use operating system authentication to gain SYSDBA system privileges for any database that runs from the specific Oracle home. If you specified an Oracle Home User during installation, the user is added to this group during installation.
ORA_HOMENAME_OPER	SYSOPER system privileges for all instances that run from the Oracle home with a name <i>HOMENAME</i>	An OSDBA group for the Oracle home with a name of <i>HOMENAME</i> . Members of this group can use operating system authentication to gain SYSOPER system privileges for any database that runs from the specific Oracle home. This group does not have any members after installation, but you can manually add users to this group after the installation completes.
ORA_HOMENAME_SYSBACKUP	SYSBACKUP system privileges for all instances that run from the Oracle home with a name of <i>HOMENAME</i>	OSBACKUPDBA group for a specific Oracle home with a name of <i>HOMENAME</i> . Members of this group have privileges necessary for performing database backup and recovery tasks on all database instances that run from the specified Oracle home directory.
ORA_HOMENAME_SYSDG	SYSDBG system privileges for all instances that run from the Oracle home with a name of <i>HOMENAME</i>	OSDGDBA group for a specific Oracle home with a name of <i>HOMENAME</i> . Members of this group have privileges necessary for performing Data Guard administrative tasks on all database instances that run from the specified Oracle home directory.

**Table 4-1 (Cont.) User Groups Created During Oracle Database Installation**

Operating System Group Name	Related System Privilege	Description
ORA_HOMENAME_SYSKM	SYSKM system privileges for all instances that run from the Oracle home with a name of <i>HOMENAME</i> .	OSKMDBA group for a specific Oracle home with a name of <i>HOMENAME</i> . Members of this group have privileges necessary for performing encryption key management tasks on all database instances that run from the specified Oracle home directory.
ORA_HOMENAME_SYSRAC	SYSRAC system privileges for all instances that run from the Oracle home with a name of <i>HOMENAME</i> .	OSRACDBA group for a specific Oracle home with a name of <i>HOMENAME</i> . Members of this group have privileges necessary for performing a limited set of Oracle Real Application Clusters administrative tasks to create a separate group of operating system users.
ORA_HOMENAME_SVCACCTS	Contains Virtual Accounts for all Oracle Database Windows Services that run from Oracle home with a name of <i>HOMENAME</i> .	SVCACCTS group specific to a Oracle home. It contains virtual accounts for all the services running under that virtual account based <i>HOMENAME</i> .
ORA_DBSVCACCTS	Contains Virtual Accounts for all Oracle Database Windows Services that run for all Virtual Accounts based Oracle homes.	DBSVCACCTS system-wide group that contains virtual accounts for all the database services for all Virtual Accounts based Oracle homes.

During the installation of Oracle Database, all groups mentioned in the table are populated for proper operation of Oracle products. You must not remove any group member populated by Oracle. However, if you want to assign specific database privileges to new Windows operating system users, then you can manually add users to these groups after the installation completes.

Oracle creates other groups, such as, ORA\_INSTALL, ORA\_CLIENT\_LISTENERS, ORA\_GRID\_LISTENERS, ORA\_HOMENAME\_SVCSIDS, ORA\_HOMENAME\_SVCACCTS, and ORA\_DBSVCACCTS

during installation and you must not change these groups, memberships, and ACLs associated with various Oracle created groups.

 **See Also:**

- *Oracle Database Administrator's Guide*
- *Oracle Automatic Storage Management Administrator's Guide*

## Operating System Groups and Users for Job Role Separation

A job role separation configuration of Oracle Database and Oracle ASM is a configuration with groups and users to provide separate groups for operating system authentication.

- [About Job Role Separation Operating System Privileges Groups and Users](#)  
During the Oracle Database installation, the `ORA_DBA`, `ORA_OPER`, `ORA_HOMENAME_DBA`, `ORA_HOMENAME_OPER`, `ORA_HOMENAME_SYSBACKUP`, `ORA_HOMENAME_SYSDG`, `ORA_HOMENAME_SYSKM`, and `ORA_HOMENAME_SYSRAC` groups are created and users assigned to these groups.
- [Oracle Software Owner For Each Oracle Software Product](#)  
You can create a single user (for example, `oracle`) to own both Oracle Database, and Oracle Restart installations.
- [Standard Oracle Database Groups for Job Role Separation for Oracle Database](#)  
Review the standard Oracle Database groups.
- [Extended Oracle Database Groups for Job Role Separation](#)  
In addition to the `SYSOPER` privilege to start up and shut down the database, you can create new administrative privileges that are more task-specific and less privileged than the `ORA_DBA/SYSDBA` system privileges to support specific administrative privileges tasks required for everyday database operation.
- [Oracle Automatic Storage Management Groups for Job Role Separation](#)  
Review the operating system groups.
- [Windows Group Managed Service Accounts and Virtual Accounts](#)  
Group Managed Services Account (gMSA) and Virtual Accounts are now supported and enable you to create and manage Database services without passwords.
- [Microsoft Hyper-V](#)  
Microsoft Hyper-V enables you to create and manage a virtualized computing environment by running multiple operating systems simultaneously on a single computer and isolate operating systems from each other.

## About Job Role Separation Operating System Privileges Groups and Users

During the Oracle Database installation, the `ORA_DBA`, `ORA_OPER`, `ORA_HOMENAME_DBA`, `ORA_HOMENAME_OPER`, `ORA_HOMENAME_SYSBACKUP`, `ORA_HOMENAME_SYSDG`, `ORA_HOMENAME_SYSKM`, and `ORA_HOMENAME_SYSRAC` groups are created and users assigned to these groups.



Members of these groups are granted operating system authentication for the set of database system privileges each group authorizes. Oracle recommends that you use different operating system groups for each set of system privileges.

## Oracle Software Owner For Each Oracle Software Product

You can create a single user (for example, `oracle`) to own both Oracle Database, and Oracle Restart installations.

However, Oracle recommends that you create one software owner to own each Oracle software installation (typically, `oracle`, for the database software and `grid` for the Oracle Restart owner user).

You must create at least one software owner the first time you install Oracle software on the system.

### Note:

In Oracle documentation, a user created to own only Oracle Grid Infrastructure software installations is called the `grid` user. A user created to own either all Oracle installations, or only Oracle database installations, is called the `oracle` user.

## Standard Oracle Database Groups for Job Role Separation for Oracle Database

Review the standard Oracle Database groups.

The following is a list of standard Oracle Database groups. These groups provide operating system authentication for database administration system privileges:

### Note:

All these groups are automatically created as a part of Oracle Database installation on Windows.

- The OSDBA group (`ORA_DBA`)  
Use this group the first time you install Oracle Database software on the system. This group identifies operating system user accounts that have database administrative privileges (the `SYSDBA` privilege) for all database instances running on the server.  
Members of the `ORA_DBA` group do not have `SYSASM` privileges on Oracle ASM instances, which are needed for mounting and dismounting disk groups.
- The OSOPER group for Oracle Database (`ORA_OPER`)  
Use this group if you want a separate group of operating system users to have a limited set of database administrative privileges for starting up and shutting down the database (the `SYSOPER` privilege).

- The OSDBA group for a particular Oracle home (`ORA_HOMENAME_DBA`)  
This group is created the first time you install Oracle Database software into a new Oracle home. This group identifies operating system user accounts that have database administrative privileges (the SYSDBA privilege) for the database instances that run from that Oracle home.
- The OSOPER group for a particular Oracle home (`ORA_HOMENAME_OPER`)  
Use this group if you want a separate group of operating system users to have a limited set of database administrative privileges for starting up and shutting down the database instances that run from a particular Oracle home (the SYSOPER privilege).

## Extended Oracle Database Groups for Job Role Separation

In addition to the SYSOPER privilege to start up and shut down the database, you can create new administrative privileges that are more task-specific and less privileged than the `ORA_DBA/SYSDBA` system privileges to support specific administrative privileges tasks required for everyday database operation.

Users granted these system privileges are also authenticated through operating system group membership.

During installation, you are prompted to provide operating system groups whose members are granted access to these system privileges. You can assign the same group to provide authentication for these privileges (for example, `ORA_DBA`), but Oracle recommends that you provide a unique group to designate each privilege.

The OSDBA subset job role separation privileges and groups consist of the following:

- The OSBACKUPDBA group for Oracle Database (`ORA_HOMENAME_SYSBKUP`)  
Use this group if you want a separate group of operating system users to have a limited set of database backup and recovery related administrative privileges (the SYSBKUP privilege).
- The OSDGDBA group for Oracle Data Guard (`ORA_HOMENAME_SYSDG`)  
Use this group if you want a separate group of operating system users to have a limited set of privileges to administer and monitor Oracle Data Guard (the SYSDG privilege).
- The OSKMDBA group for encryption key management (`ORA_HOMENAME_SYSKM`)  
Use this group if you want a separate group of operating system users to have a limited set of privileges for encryption key management such as Oracle Wallet Manager management (the SYSKM privilege).
- The OSRACDBA group for Oracle Real Application Clusters Administration (`ORA_HOMENAME_SYSRAC`)  
Use this group if you want a separate group of operating system users to have a limited set of Oracle Real Application Clusters (RAC) administrative privileges (the SYSRAC privilege). To use this privilege:
  - Add the Oracle Database installation owners as members of this group.

 **Note:**

All these groups, `ORA_HOMENAME_SYSBACKUP`, `ORA_HOMENAME_SYSDG`, `ORA_HOMENAME_SYSKM`, and `ORA_HOMENAME_SYSRAC` are applicable only to the database instances running from that particular Oracle home.

## Oracle Automatic Storage Management Groups for Job Role Separation

Review the operating system groups.

Create the following operating system groups if you are installing Oracle Grid Infrastructure:

- The OSDBA group for Oracle ASM (`ORA_ASMDBA`)

This group grants access for the database to connect to Oracle ASM. During installation, the Oracle Installation Users are configured as members of this group. After you create an Oracle Database, this group contains the Oracle Home Users of those database homes. Any client of Oracle ASM that needs to access storage managed by Oracle ASM needs to be in this group.
- The OSASM group for Oracle ASM Administration (`ORA_ASMADMIN`)

Use this separate group to have separate administration privilege groups for Oracle ASM and Oracle Database administrators. Members of this group are granted the SYSASM system privilege to administer Oracle ASM. In Oracle documentation, the operating system group whose members are granted privileges is called the OSASM group. During installation, the Oracle Installation User for Oracle Grid Infrastructure and Oracle Database Service IDs are configured as members of this group. Membership in this group also grants database access to the Oracle ASM disks.

Members of the OSASM group can use SQL to connect to an Oracle ASM instance as SYSASM using operating system authentication. The SYSASM privilege permits mounting and dismounting disk groups, and other storage administration tasks. SYSASM system privileges do not grant access privileges on an Oracle Database instance.
- The OSOPER group for Oracle ASM (`ORA_ASMOPER`)

This is an optional group. Create this group if you want a separate group of operating system users to have a limited set of Oracle ASM instance administrative privileges (the SYSOPER for ASM privilege), including starting up and stopping the Oracle ASM instance. By default, members of the OSASM group also have all privileges granted by the SYSOPER for ASM privilege.

To use the Oracle ASM Operator group to create an Oracle ASM administrator with fewer privileges than those granted by the SYSASM system privilege you must assign the user to this group after installation.

 **See Also:**

- *Oracle Database Administrator's Guide*
- *Oracle Database Security Guide*

## Windows Group Managed Service Accounts and Virtual Accounts

Group Managed Services Account (gMSA) and Virtual Accounts are now supported and enable you to create and manage Database services without passwords.

## Microsoft Hyper-V

Microsoft Hyper-V enables you to create and manage a virtualized computing environment by running multiple operating systems simultaneously on a single computer and isolate operating systems from each other.

Microsoft Hyper-V enables built-in integration services for supported guest operating systems to improve the integration between a computer and a virtual machine.

 **See Also:**

<http://www.oracle.com/technetwork/database/virtualizationmatrix-172995.html> for more information about Microsoft Hyper-V support

## Stopping Existing Oracle Services

Learn how to stop all processes, including the listener and database, running in the Oracle home.

 **Caution:**

If you are installing additional Oracle Database 12c products in an existing Oracle home, then stop *all* processes, including the listener and database, running in the Oracle home. You cannot install into an existing Oracle home other than 12c. You must complete this task to enable Oracle Universal Installer to relink certain executables and libraries.

Consider the following before you install Oracle Restart or Oracle Database:

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

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

- If you have an existing Oracle Database 12c running on Oracle ASM, then stop any existing Oracle ASM instances. After you finish installing Oracle Restart, start the Oracle ASM instance again.

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

## Configuring User Accounts

During installation, you can specify an Oracle Home User.

Before starting the installation, perform the following checks for the Oracle Installation users to ensure the installation succeeds:

- [Configuring Environment Variables for the Software Installation Owner](#)  
Before starting the Oracle Database installation, ensure that the `TEMP` environment variable is set correctly.
- [Managing User Accounts with User Account Control](#)  
To ensure that only trusted applications run on your computer, the Windows operating systems that support Oracle Database, provide User Account Control.

## Configuring Environment Variables for the Software Installation Owner

Before starting the Oracle Database installation, ensure that the `TEMP` environment variable is set correctly.

## Managing User Accounts with User Account Control

To ensure that only trusted applications run on your computer, the Windows operating systems that support Oracle Database, provide User Account Control.

If you have enabled this security feature, then, depending on the configuration, Oracle Universal Installer prompts you for either your consent or your credentials when installing Oracle Database.

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

 **See Also:**

*Oracle Database Platform Guide for Microsoft Windows*

**To start a command prompt window with Windows Administrator privileges:**

1. On your desktop, create a shortcut for the command prompt window. An icon for that shortcut appears on the desktop.
2. Right-click the icon for the newly created shortcut, and specify **Run as administrator**.

When you open this window, the title bar reads Administrator: Command Prompt. Run commands from within this window using Administrator privileges.

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## Installing and Configuring Oracle Restart

If you intend to use Oracle Automatic Storage Management (Oracle ASM), then you must install Oracle Restart before installing your database.

Oracle Grid Infrastructure for a standalone server is a version of Oracle Grid Infrastructure that supports single instance databases. This support includes volume management, file system, and automatic restart capabilities. Oracle Grid Infrastructure for a standalone server includes Oracle Restart and Oracle Automatic Storage Management. Oracle combined the two infrastructure products into a single set of binaries that is installed into an Oracle Restart home.

Oracle Restart is a feature provided as part of Oracle Grid Infrastructure. Oracle Restart monitors and can restart Oracle Database instances, Oracle Net Listeners, and Oracle ASM instances. Oracle Restart is currently restricted to manage single instance Oracle Databases and Oracle ASM instances only, and is subject to desupport in future releases. Oracle continues to provide Oracle ASM as part of the Oracle Grid Infrastructure installation for a standalone server and Cluster deployments.

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

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

- When there is a hardware or a software failure, Oracle Restart automatically starts all Oracle components, including the Oracle database instance, Oracle Net Listener, database services, and Oracle ASM.
- Oracle Restart starts components in the proper order when the database host is restarted.
- Oracle Restart runs periodic checks to monitor the status of Oracle components. If a check operation fails for a component, then the component is shut down and restarted.

 **Note:**

- You can neither install Oracle Restart on an Oracle Grid Infrastructure cluster member node, nor add an Oracle Restart server to an Oracle Grid Infrastructure cluster member node. Oracle Restart supports single-instance databases on one server, while Oracle Grid Infrastructure for a Cluster supports single-instance or Oracle RAC databases on a cluster.
- If you want to use Oracle ASM or Oracle Restart, then you must install Oracle Grid Infrastructure for a standalone server before you install and create the database. Otherwise, you must install Oracle Restart, and then manually register the database with Oracle Restart.
- You can use the Oracle Restart implementation of Oracle Grid Infrastructure only in single-instance (nonclustered) environments. Use Oracle Grid Infrastructure with Oracle Clusterware for clustered environments.

- [About Image-Based Oracle Grid Infrastructure Installation](#)  
Starting with Oracle Grid Infrastructure 12c Release 2 (12.2), installation and configuration of Oracle Grid Infrastructure software is simplified with image-based installation.
- [Requirements for an Oracle Restart Installation](#)  
Before you install Oracle Restart, ensure that your system meets the following requirements:
- [Oracle ACFS and Oracle ADVM](#)  
Learn about Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and Oracle Automatic Storage Management Dynamic Volume Manager (Oracle ADVM).
- [Oracle Automatic Storage Management Storage Configuration](#)  
Review the following sections for information on Oracle Automatic Storage Management (Oracle ASM) storage configuration:
- [Configuring Oracle Automatic Storage Management Disk Groups Manually Using Oracle ASMCA](#)  
The Oracle Automatic Storage Management Configuration Assistant utility creates a new Oracle Automatic Storage Management instance if there is no Oracle Automatic Storage Management instance currently configured on this computer.
- [Installing Oracle Restart Using a Software-Only Installation](#)  
A software-only installation only installs the Oracle Restart binaries at the specified location. You must complete a few manual configuration steps to enable Oracle Restart after you install the software.
- [Testing the Oracle Automatic Storage Management Installation](#)  
After installing Oracle Grid Infrastructure for a single instance, use the ASMCMD command-line utility to test the Oracle ASM installation.
- [About Upgrading Existing Oracle Automatic Storage Management Instances](#)  
Oracle Automatic Storage Management (Oracle ASM) upgrades are carried out during an Oracle Grid Infrastructure upgrade.



- [Installing and Configuring Oracle Grid Infrastructure for a Standalone Server](#)  
Oracle Grid Infrastructure for a standalone server includes Oracle Restart and Oracle Automatic Storage Management.
- [Installing and Configuring Oracle Restart](#)  
Oracle Grid Infrastructure for a standalone server includes Oracle Restart and Oracle Automatic Storage Management.
- [Modifying Oracle Grid Infrastructure for Oracle Restart Binaries After Installation](#)  
After installation, you must first stop the Oracle Restart stack to modify the software installed in your Grid home.

**See Also:**

[My Oracle Support Note 1584742.1](#)

## About Upgrading Existing Oracle Automatic Storage Management Instances

Oracle Automatic Storage Management (Oracle ASM) upgrades are carried out during an Oracle Grid Infrastructure upgrade.

If you are upgrading from Oracle ASM 11g Release 2 (11.2.0.4) or later, then Oracle ASM is always upgraded with Oracle Grid Infrastructure as part of the upgrade, and Oracle Automatic Storage Management Configuration Assistant (Oracle ASMCA) is started by the root scripts during upgrade. Subsequently, you can use Oracle ASMCA (located in `Grid_home/bin`) to configure failure groups, Oracle ASM volumes, and Oracle Automatic Storage Management Cluster File System (Oracle ACFS).

Oracle ASMCA cannot perform a separate upgrade of Oracle ASM from a prior release to the current release.

Upgrades of Oracle ASM from releases prior to 11g Release 2 (11.2) are not supported.

### Related Topics

- *Oracle Automatic Storage Management Administrator's Guide*
- *Oracle Database Upgrade Guide*

## Installing and Configuring Oracle Grid Infrastructure for a Standalone Server

Oracle Grid Infrastructure for a standalone server includes Oracle Restart and Oracle Automatic Storage Management.

If you install Oracle Grid Infrastructure for a standalone server and then create your database, then the database is automatically added to the Oracle Restart configuration. Oracle Restart automatically restarts the database when required.

If you install Oracle Grid Infrastructure for a standalone server on a host computer on which a database already exists, then you must manually add the database, the

listener, the Oracle ASM instance, and other components to the Oracle Restart configuration before you are able to configure automatic database restarts.



**Note:**

Oracle Grid Infrastructure for a standalone server can support multiple single-instance databases on a single host computer.

## About Image-Based Oracle Grid Infrastructure Installation

Starting with Oracle Grid Infrastructure 12c Release 2 (12.2), installation and configuration of Oracle Grid Infrastructure software is simplified with image-based installation.

To install Oracle Grid Infrastructure, create the new Grid home with the necessary user group permissions, and then extract the image file into the newly-created Grid home, and run the setup wizard to register the Oracle Grid Infrastructure product.

Using image-based installation, you can do the following:

- Install and upgrade Oracle Grid Infrastructure for cluster configurations.
- Install Oracle Grid Infrastructure for a standalone server (Oracle Restart).
- Install only Oracle Grid Infrastructure software, and register the software with Oracle inventory.
- Add nodes to your existing cluster, if the Oracle Grid Infrastructure software is already installed or configured.

This installation feature streamlines the installation process and supports automation of large-scale custom deployments. You can also use this installation method for deployment of customized images, after you patch the base-release software with the necessary Patch Set Updates (PSUs) and patches.



**Note:**

You must extract the image software into the directory where you want your Grid home to be located, and then run the `gridSetup.sh` script to start the Grid Infrastructure setup wizard. Ensure that the Grid home directory path you create is in compliance with the Oracle Optimal Flexible Architecture recommendations.

## Requirements for an Oracle Restart Installation

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

- **System Requirements**  
Oracle Restart has similar system requirements as Oracle Grid Infrastructure for a cluster, such as requiring 64-bit Windows server operating system.

- [Memory Requirements](#)  
At least 1 GB of RAM for Oracle Restart installations, including installations where you plan to install Oracle Database.
- [Disk Space Requirements](#)  
The disk space requirements for installing Oracle Restart are:

## System Requirements

Oracle Restart has similar system requirements as Oracle Grid Infrastructure for a cluster, such as requiring 64-bit Windows server operating system.

Components included with Oracle Grid Infrastructure, such as Oracle ASM, have the same system requirements as Oracle Grid Infrastructure.



### See Also:

*Oracle Grid Infrastructure Installation and Upgrade Guide for Microsoft Windows x64 (64-Bit)*

## Memory Requirements

At least 1 GB of RAM for Oracle Restart installations, including installations where you plan to install Oracle Database.

## Disk Space Requirements

The disk space requirements for installing Oracle Restart are:

- At least 7 GB of disk space
- The amount of disk space available in the %TEMP% directory is equivalent to the total amount of free disk space, minus what is required to install Oracle Restart

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

- Delete unnecessary files from the %TEMP% directory to meet the disk space requirement.
- Set TEMP environment variable. Go to System Properties, then Environment Variables, "TEMP=C:\Temp\."

### Related Topics

- [Oracle Database Preinstallation Tasks](#)  
Review the preinstallation tasks before you start Oracle Universal Installer.

## Oracle ACFS and Oracle ADVM

Learn about Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and Oracle Automatic Storage Management Dynamic Volume Manager (Oracle ADVM).

- [About Oracle ACFS and Oracle ADVM](#)  
Oracle ACFS extends Oracle ASM technology to support all of your application data in both single instance and cluster configurations.
- [Oracle ACFS and Oracle ADVM Support on Windows](#)  
Oracle ACFS and Oracle ADVM are supported on Windows Server 2008 R2 x64, Windows Server 2012 x64, and Windows Server 2012 R2 x64.

## About Oracle ACFS and Oracle ADVM

Oracle ACFS extends Oracle ASM technology to support all of your application data in both single instance and cluster configurations.

Oracle ADVM provides volume management services and a standard disk device driver interface to clients. Oracle Automatic Storage Management Cluster File System communicates with Oracle ASM through the Oracle Automatic Storage Management Dynamic Volume Manager interface.

## Oracle ACFS and Oracle ADVM Support on Windows

Oracle ACFS and Oracle ADVM are supported on Windows Server 2008 R2 x64, Windows Server 2012 x64, and Windows Server 2012 R2 x64.



### See Also:

- My Oracle Support Note 1369107.1 for more information about platforms and releases that support Oracle ACFS and Oracle ADVM:

<https://support.oracle.com>

- Patch Set Updates for Oracle Products (My Oracle Support Note 854428.1 for current release and support information:

<https://support.oracle.com>

# Oracle Automatic Storage Management Storage Configuration

Review the following sections for information on Oracle Automatic Storage Management (Oracle ASM) storage configuration:

- [Managing Disk Groups for Older Database Versions](#)  
Use Oracle ASM Configuration Assistant (Oracle ASMCA) to create and modify disk groups when you install earlier versions of Oracle databases on Oracle Grid Infrastructure installations.
- [Oracle Automatic Storage Management Installation Considerations](#)  
In previous releases, Oracle Automatic Storage Management (Oracle ASM) was installed as part of the Oracle Database installation. Starting with Oracle Database 11g Release 2 (11.2), Oracle Automatic Storage Management is part of an Oracle Grid Infrastructure installation, either for a cluster, or for a standalone server.

- [Configuring Storage for Oracle Automatic Storage Management](#)  
Identify storage requirements and ASM disk group options.

## Managing Disk Groups for Older Database Versions

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

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



### See Also:

*Oracle Automatic Storage Management Administrator's Guide*

## Oracle Automatic Storage Management Installation Considerations

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

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

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

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

- You must complete the steps listed under the *Configuring Storage for Oracle Automatic Storage Management* section to prepare a disk partition to use for the Oracle Automatic Storage Management disk groups.
- Ensure that at least one disk is configured appropriately in an Oracle ASM disk group before beginning the installation.
- When you install Oracle Automatic Storage Management, Oracle Automatic Storage Management Configuration Assistant creates a separate server parameter file (`SPFILE`) and password file for the Oracle Automatic Storage Management instance. As soon as Oracle Automatic Storage Management is installed, `ASMSNMP` schema and user are created.

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

### Related Topics

- [Configuring Storage for Oracle Automatic Storage Management](#)  
Identify storage requirements and ASM disk group options.

#### See Also:

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

- Performance and Scalability Considerations for Disk Groups
- Password File Authentication for Oracle ASM

## Configuring Storage for Oracle Automatic Storage Management

Identify storage requirements and ASM disk group options.

- [Identifying Storage Requirements for Oracle Automatic Storage Management](#)  
To identify the storage requirements for using Oracle Automatic Storage Management, you must determine the number of devices and the amount of free disk space that you require.
- [ASM Disk Group Options for Interactive and Noninteractive Installation](#)  
You can select new disk groups during interactive installations, but you must use existing disk groups for noninteractive installations.
- [Configuring Disks Manually for Oracle Automatic Storage Management](#)  
To use Oracle Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN), the disks must be stamped with a header.

### Related Topics

- [ASM Disk Group Options for Interactive and Noninteractive Installation](#)  
You can select new disk groups during interactive installations, but you must use existing disk groups for noninteractive installations.
- [Configuring Disks Manually for Oracle Automatic Storage Management](#)  
To use Oracle Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN), the disks must be stamped with a header.

#### See Also:

*Oracle Automatic Storage Management Administrator's Guide*

## Identifying Storage Requirements for Oracle Automatic Storage Management

To identify the storage requirements for using Oracle Automatic Storage Management, you must determine the number of devices and the amount of free disk space that you require.

To complete this task, follow these steps:

1. Determine whether you want to use Oracle ASM for Oracle Database files, recovery files, or both. Oracle Database files include data files, control files, redo log files, the server parameter file, and the password file.

During the database installation, you have the option to select either a file system or Oracle ASM as the storage mechanism for Oracle Database files. Similarly, you also have the option to select either a file system or Oracle ASM as the storage mechanism for your recovery files.

 **Note:**

You do not have to use the same storage mechanism for both Oracle Database files and recovery files. You can use a file system for one file type and Oracle ASM for the other.

If you select Oracle ASM as your storage option for Oracle Database files, then depending on your choice in the Specify Recovery Options screen, you have the following recovery options:

- If you select the Oracle ASM option for your recovery files, then Oracle Universal Installer provides you with only the option to use the same disk group for both Oracle Database files and recovery files.
  - If you decide not to enable recovery during the database installation, then, after the database installation, you can modify the `DB_RECOVERY_FILE_DEST` parameter to enable the fast recovery area.
2. Choose the Oracle ASM redundancy level to use for each Oracle Automatic Storage Management disk group you create.

The redundancy level that you choose for the Oracle ASM disk group determines how Oracle 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:

- Normal redundancy

To optimize performance and reliability in a normal redundancy disk group, Oracle ASM uses two-way mirroring for data files and three-way mirroring for control files, by default. In addition, you can choose the mirroring characteristics for individual files in a disk group. 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

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

- Flex redundancy

A flex redundancy disk group is a new disk group type with features such as flexible file redundancy, mirror splitting, and redundancy change. A flex disk group can consolidate files with different redundancy requirements into a single disk group. It also provides the capability for databases to change the redundancy of its files.

For database data, you can choose no mirroring (unprotected), two-way mirroring (mirrored), or three-way mirroring (high). A flex redundancy disk group requires a minimum of three disk devices (or three failure groups).

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

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

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

**Table 5-1 Oracle ASM Disk Number and Space Requirements for an Oracle database (non-CDB)**

Redundancy Level	Minimum Number of Disks	Data Files	Recovery Files	Both File Types
External	1	2.7 GB	8.1 GB	10.8 GB
Normal	2	5.2 GB	15.6 GB	20.8 GB
High	3	7.8 GB	23.4 GB	31.2 GB
Flex	3	7.8 GB	23.4 GB	31.2 GB

**Table 5-2 Oracle ASM Disk Number and Space Requirements for a multitenant container database (CDB) with one pluggable database (PDB)**

Redundancy Level	Minimum Number of Disks	Data Files	Recovery Files	Both File Types
External	1	4.4 GB	13.2 GB	17.6 GB
Normal	2	8.6 GB	25.8 GB	34.4 GB
High	3	12.9 GB	38.7 GB	51.6 GB
Flex	3	12.9 GB	38.7 GB	51.6 GB



 **Note:**

- The disk devices must be owned by the user performing the grid installation.

Check with your system administrator to determine if the disks used by Oracle ASM are mirrored at the storage level. If so, select External for the redundancy. If the disks are not mirrored at the storage level, then select Normal for the redundancy.

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

#### 4. (Optional) Identify failure groups for the Oracle ASM disk group devices.

If you intend to use a normal or high redundancy disk group, then 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, then the disk group becomes unavailable if the controller fails. The controller in this example is a single point of failure. To protect against 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 enables the disk group to tolerate the failure of one SCSI controller.

 **Note:**

Define custom failure groups after installation, using the GUI tool ASMCA, the command line tool `asmcmd`, or SQL commands.

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

For failure groups containing database files and clusterware files, including voting files, you must specify a minimum of three failure groups for normal redundancy disk groups, and five failure groups for high redundancy disk groups. Disk groups containing voting files must have at least three failure groups for normal redundancy or at least five failure groups for high redundancy. Otherwise, the minimum is two and three respectively. The minimum number of failure groups applies whether or not they are custom failure groups.

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

- The disk devices must be owned by the user performing the Oracle Grid Infrastructure installation.
- All the devices in an Oracle ASM disk group must be the same size and have the same performance characteristics.

- Do not specify multiple partitions on a single physical disk as a disk group device. Oracle Automatic Storage Management expects each disk group device to be on a separate physical disk.
- Although you can specify a logical volume as a device in an Oracle ASM disk group, Oracle does not recommend their use because it adds a layer of complexity that is unnecessary with Oracle ASM. Oracle recommends that if you choose to use a logical volume manager, then use the logical volume manager. The logical volume manager represents a single logical unit number (LUN) without striping or mirroring. You can minimize the effect on storage performance of the additional storage layer.

## ASM Disk Group Options for Interactive and Noninteractive Installation

You can select new disk groups during interactive installations, but you must use existing disk groups for noninteractive installations.

Select from the following choices to store either database or recovery files in an existing Oracle ASM disk group, depending on installation method:

- Installation method that runs Database Configuration Assistant in an interactive mode (either during installation or after installation)
  - Select new Disk Group
  - Select existing Disk Group
- Installation method that runs Database Configuration Assistant in a noninteractive mode (either during installation or after installation)

Select an existing Disk Group only. You cannot create a disk group during noninteractive installations. You can add disk devices to an existing disk group if it has insufficient free space.

### Note:

The Oracle ASM instance that manages the existing disk group can be running in a different Oracle home directory.

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

### Step 1: Enabling Disk Automounting

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

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

To enable automounting:

1. Enter the following commands at a command prompt:

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

2. Restart your computer.

## Step 2: Creating the Disk Partitions

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

- The graphical user interface Disk Management snap-in to manage disks.  
To access this tool, type `diskmgmt.msc` at the command prompt. (Optional) From the **Start** menu, select **All Programs**, then **Administrative Tools**, then **Computer Management**. Then select the **Disk Management** node in the Storage tree.

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

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

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

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

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

where:

- `diskpart.exe` is the command-line tool for managing disks.
- `diskn` is the disk number where the partitions are created.
- `sizen` is the size of the partition, for example 500 represents 500 MB.

### See Also:

The online help or documentation for the administration tool that you are using

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

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

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 extended
DISKPART> create partition logical size=800
DISKPART> ...
DISKPART> create partition logical size=500
```

## Configuring Disks Manually for Oracle Automatic Storage Management

To use Oracle Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN), the disks must be stamped with a header.

If you install Oracle Restart in an interactive mode, Oracle Universal Installer configures the headers of the disk during the installation process. However, if you intend to install Oracle Restart in a response file mode, then you must manually configure the disks before installation by using either `asmtoolg` (GUI version) or `asmtool` (command-line version). You can also use these tools to reconfigure the disks after installation. The `asmtoolg` and `asmtool` utilities work only on partitioned disks: you cannot use Oracle Automatic Storage Management on unpartitioned disks.

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

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

### Using the `asmtoolg` Tool (Graphical User Interface)

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

To add or change disk stamps:

1. In the installation media labeled Oracle Grid Infrastructure 12c Release 2 (12.2), from the media root, go to `asmtool` directory and double-click `asmtoolg.exe`.

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

If User Account Control is enabled, then create a shortcut for the command prompt window on your desktop. An icon for that shortcut appears on the desktop. Right click the icon for the newly created shortcut, and specify "Run as administrator." When the command window opens, go to `ORACLE_HOME\bin`, and then type `asmtoolg`.

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

The `asmtoolg` tool shows the devices available on the system. Unrecognized disks are labeled as "Candidate device", stamped Oracle Automatic Storage

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

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

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

You can also specify the stamps of individual devices.

4. (Optional) Select a disk to edit the individual stamp (Oracle Automatic Storage Management link name).
5. Click **Next**.
6. Click **Finish**.

To delete disk stamps:

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

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

2. In the Delete Stamps window, select the disks to unstamp.
3. Click **Next**.
4. Click **Finish**.

### Example 5-1 Using the `asmtool` Utility (Command Line)

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

It has the following options:

Option	Description
<code>-add</code>	<p>Adds or changes stamps. You must specify the hard disk, partition, and new stamp name. If the disk is a raw device or has an existing Oracle Automatic Storage Management stamp, then you must specify the <code>-force</code> option. Also sets Oracle Automatic Storage Management instances to rescan the available disks.</p> <p>Example:</p> <pre>asmtool -add [-force] \Device\Harddisk1\Partition1 ORCLDISKASM0 \Device\Harddisk2\Partition1 ORCLDISKASM2...</pre>

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

### Related Topics

- [ASM Disk Group Options for Interactive and Noninteractive Installation](#)  
You can select new disk groups during interactive installations, but you must use existing disk groups for noninteractive installations.

## Configuring Oracle Automatic Storage Management Disk Groups Manually Using Oracle ASMCA

The Oracle Automatic Storage Management Configuration Assistant utility creates a new Oracle Automatic Storage Management instance if there is no Oracle Automatic Storage Management instance currently configured on this computer.

After installing Oracle Restart, you can also use Oracle Automatic Storage Management Configuration Assistant to create and configure disk groups, Oracle Automatic Storage Management Dynamic Volume Manager (Oracle ADVM), and Oracle Automatic Storage Management Cluster File System (Oracle ACFS).

If you want to create additional disk groups or manually configure Oracle Automatic Storage Management disks, then you can run the Oracle Automatic Storage Management Configuration Assistant as follows:

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

 **See Also:**

*Oracle Automatic Storage Management Administrator's Guide*

## Installing Oracle Restart Using a Software-Only Installation

A software-only installation only installs the Oracle Restart binaries at the specified location. You must complete a few manual configuration steps to enable Oracle Restart after you install the software.

 **Note:**

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

- [Installing the Software Binaries](#)  
Use this procedure to do a software-only installation of Oracle Restart.
- [Configuring Software Binaries for Oracle Restart](#)  
Use this procedure to configure and activate a software-only Oracle Restart without Oracle Automatic Storage Management (Oracle ASM).

## Installing the Software Binaries

Use this procedure to do a software-only installation of Oracle Restart.

1. Log in to Windows as an Administrator user.
2. Download the Oracle Grid Infrastructure installation image files, create the Grid home directory, and extract the image files in this Grid home directory.

For example:

```
C:\> mkdir \app\oracle\product\12.2.0\grid
C:\> cd \app\oracle\product\12.2.0\grid
C:\> unzip -q download_location\grid.zip
```

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

For Example:

```
C:\> app\oracle\product\12.2.0\grid\runcluvfy.bat
```

4. Log in as the Oracle Restart software owner user and run `gridSetup.bat` to start the Oracle Grid Infrastructure installation wizard.

```
C:\> app\oracle\product\12.2.0\grid\gridSetup.bat
```

5. In the Select Configuration Option screen, select the **Set Up Software Only** option to perform a software-only installation of Oracle Restart. Click **Next**.

6. Respond to the prompts as needed to set up Oracle Grid Infrastructure. Click **Help** for information.

## Configuring Software Binaries for Oracle Restart

Use this procedure to configure and activate a software-only Oracle Restart without Oracle Automatic Storage Management (Oracle ASM).

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

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

For example, if your Grid home is `C:\app\oracle\product\12.2.0\grid`, then run the following script:

```
C:\app\oracle\product\12.2.0\grid\perl\bin\perl -I C:\app\oracle\product
\12.2.0\grid\perl\lib -I
C:\app\oracle\product\12.2.0\grid\crs\install
C:\app\oracle\product\12.2.0\grid\crs\install\roothas.pl
```

2. Change the home directory to the path of the Oracle Restart home as follows:

`Grid_home\oui\bin`, (where `Grid_home` is the path of the Oracle Restart home).

3. Enter the following command:

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

For example:

```
C:\app\oracle\product\12.2.0\grid> setup.exe -updateNodeList ORACLE_HOME=C:\app
\oracle\product\12.2.0\grid
CLUSTER_NODES= CRS=TRUE
```

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

### See Also:

- *Oracle Database Net Services Administrator's Guide*
- *Oracle Automatic Storage Management Administrator's Guide*
- *Oracle Database Administrator's Guide*

### Related Topics

- [Installing Oracle Restart with a New Database Installation](#)  
Complete these steps to install Oracle Restart and then create a database that is managed by Oracle Restart.



# Testing the Oracle Automatic Storage Management Installation

After installing Oracle Grid Infrastructure for a single instance, use the ASMCMD command-line utility to test the Oracle ASM installation.

To test the Oracle Automatic Storage Management installation:

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

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

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

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

## See Also:

*Oracle Automatic Storage Management Administrator's Guide*

## Installing and Configuring Oracle Restart

Oracle Grid Infrastructure for a standalone server includes Oracle Restart and Oracle Automatic Storage Management.

If you install Oracle Restart and then create your database, the database is automatically added to the Oracle Restart configuration, and is then automatically restarted when required. Oracle Restart automatically restarts the database when required.

If you install Oracle Restart on a host computer on which a database already exists, then you must manually add the database, the listener, the Oracle ASM instance, and other components to the Oracle Restart configuration before you are able to configure automatic database restarts.

## Note:

Oracle Restart can support multiple single-instance databases on a single host computer.

- [Installing Oracle Restart with a New Database Installation](#)  
Complete these steps to install Oracle Restart and then create a database that is managed by Oracle Restart.

## Installing Oracle Restart with a New Database Installation

Complete these steps to install Oracle Restart and then create a database that is managed by Oracle Restart.

Install Oracle Restart, which installs Oracle Restart and Oracle ASM, and creates one disk group.

1. Log in as the Oracle Restart software owner user (`grid`).
2. Download the Oracle Grid Infrastructure installation image files, create the Grid home directory, and extract the image files in this Grid home directory.

For example:

```
C:\> mkdir \app\oracle\product\12.2.0\grid
C:\> icacls grid:oinstall \app\oracle\product\12.2.0\grid
C:\> cd \app\oracle\product\12.2.0\grid
C:\> unzip -q download_location\grid_home.zip
```

 **Note:**

Ensure that the Grid home directory path you create is in compliance with the Oracle Optimal Flexible Architecture recommendations. Also, unzip the installation image files only in this Grid home directory that you created.

3. Run `gridSetup.bat` to start the Oracle Grid Infrastructure installation wizard.

```
C:> Grid_home\gridSetup.bat
```

 **Note:**

You must install Oracle Restart from the Oracle Grid Infrastructure media.

4. In the Select Configuration Option screen, select the **Configure Oracle Restart** option to install and configure Oracle Restart and Oracle ASM. Click **Next**.
5. During installation, disk paths mounted on Oracle ASM and registered on Oracle ASMFD with the string `ORCL:*` are listed as default database storage candidate disks.
6. Configure Oracle ASM as needed with additional disk groups.
  - The default Disk Group Name is DATA. You can enter a new name for the disk group, or use the default name.
  - Any additional disk devices that you create must be owned by the user performing the grid installation.
7. Respond to the configuration prompts as needed to configure Oracle Grid Infrastructure. Click **Help** for information.

8. Provide information to automate root scripts, or run scripts as root when prompted by Oracle Universal Installer.

If you configure automation for running root scripts, and a root script fails, then you can fix the problem manually, and click **Retry** to run the root script again

9. Start the Oracle Database installation, and select Oracle ASM disk groups for Oracle Database files storage. For assistance during installation, click **Help** on the Oracle Universal Installer page where you need more information.
- [Installing Oracle Restart for an Existing Database](#)  
Follow the high-level instructions in this section to install Oracle Restart and configure it for an existing Oracle database.

## Installing Oracle Restart for an Existing Database

Follow the high-level instructions in this section to install Oracle Restart and configure it for an existing Oracle database.

Oracle Restart 12c Release 2 (12.2) can only manage resources from the same release. For this reason, you can install Oracle Restart to provide services only for Oracle Database 12c Release 2 (12.2). However, previous release Oracle Databases can coexist on the same server without being managed by Oracle Restart.

To install Oracle Restart for a database that is already installed:

1. On the same host computer as the database, install Oracle Restart, and select **Configure Oracle Grid Infrastructure for a Standalone Server (Oracle Restart)** as the installation option. See, “Installing Oracle Restart with a New Database Installation” in *Oracle Database Installation Guide*.

The Oracle Restart components are installed in an Oracle Grid Infrastructure Oracle home (Grid home), which is in a different location from existing Oracle Database homes.

2. If you have an existing Oracle Database, then register it for High Availability with Oracle Restart using the `srvctl` command:

```
DRIVE_LETTER:\> cd ORACLE_HOME\bin
DRIVE_LETTER:\> srvctl add database -db dbname -o oracle_home_path -dbtype SINGLE
```

### Related Topics

- [Installing Oracle Restart with a New Database Installation](#)  
Complete these steps to install Oracle Restart and then create a database that is managed by Oracle Restart.

#### See Also:

*Oracle Database Administrator's Guide*

## Modifying Oracle Grid Infrastructure for Oracle Restart Binaries After Installation

After installation, you must first stop the Oracle Restart stack to modify the software installed in your Grid home.

For example, to apply a one-off patch or modify any of the DLLs used by Oracle Restart or Oracle ASM, you must follow these steps to stop and restart the Oracle Restart stack.

### **Caution:**

Before relinking executables, you must shut down all executables that run in the Oracle home directory that you are relinking. In addition, shut down applications linked with Oracle shared libraries.

Prepare the Oracle Restart home for modification using the following procedure:

1. Log in using a member of the Administrators group and go to the directory `Grid_home\bin`, where `Grid_home` is the path to the Oracle Restart home.
2. Shut down the Oracle Restart stack using the following command:

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

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

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

### **Note:**

Starting with Oracle Database 12c Release 1 (12.1.0.2), the `roothas.bat` script replaces the `roothas.pl` script in the Oracle Grid Infrastructure home.

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

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

Apply the patches using `opatch apply`.

4. Lock the Grid home:

```
DRIVE_LETTER:\Grid_home\crs\install>roothas.bat -lock
```

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

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

### Example 5-2 Enabling Oracle ACFS on Oracle Restart Configurations

To use Oracle ACFS on Oracle Restart configurations, you must first enable Administrator access for Oracle ACFS using the following command:

```
DRIVE_LETTER:\cd Grid_home\crs\install  
DRIVE_LETTER:\Grid_home\crs\install>roothas.bat -lockacfs
```



#### See Also:

*Oracle OPatch User's Guide for Windows and UNIX*

# 6

## Installing Oracle Database

Learn how to install Oracle Database using the installer.

- [Preinstallation Considerations for Installing Oracle Database](#)  
The Oracle Database software is available on the installation media or you can download it from the Oracle Technology Network (OTN) website.
- [Reviewing Component-Specific Installation Guidelines](#)  
Review the following guidelines before starting Oracle Universal Installer:
- [Accessing the Installation Software](#)  
The Oracle software is available on the installation media or you can download it from the Oracle Technology Network website, or Oracle Software Delivery Cloud website.
- [Installing and Using Oracle Components in Different Languages](#)  
Learn about installing and using Oracle components in different languages.
- [Running Oracle Universal Installer in Different Languages](#)  
Describes how to run Oracle Universal Installer in other languages.
- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.
- [Cloning an Oracle Home](#)  
Follow these steps to clone an Oracle home.

### Preinstallation Considerations for Installing Oracle Database

The Oracle Database software is available on the installation media or you can download it from the Oracle Technology Network (OTN) website.

In most cases, Oracle Universal Installer provides a graphical user interface (GUI) to install the software. However, you can also use Oracle Universal Installer without the GUI by supplying a response file with silent or response file mode.

 **Note:**

Windows requires Administrator privileges at the command prompt.

- [Installation Consideration on Windows](#)  
On Windows, open command prompts with the Administrator privileges.
- [Performing Multiple Oracle Database Installations](#)  
To perform multiple installations of Oracle Database, use either of the following methods to install Oracle Database:

- [Installing on Systems That Already Have Oracle Components](#)  
Perform the following steps when other components exist on your computer:
- [Installing with Minimum Memory Requirements](#)  
Installations of Oracle Database on computers with RAM and virtual memory lesser than the minimum required have the following limitations:

#### Related Topics

- [Reviewing Component-Specific Installation Guidelines](#)  
Review the following guidelines before starting Oracle Universal Installer:

## Installation Consideration on Windows

On Windows, open command prompts with the Administrator privileges.

## Performing Multiple Oracle Database Installations

To perform multiple installations of Oracle Database, use either of the following methods to install Oracle Database:

- **Response files:** At each node, you run Oracle Universal Installer from the command line using silent or response file mode and you supply a response file to provide information Oracle Universal Installer needs. The response file is a text file containing the settings you normally enter in the Oracle Universal Installer GUI dialog boxes.
- **Cloning the Oracle home of an existing Oracle Database installation:** With this method, install one instance of Oracle Database, and then clone its Oracle home for each additional installation.

#### Related Topics

- [Installing and Configuring Oracle Database Using Response Files](#)  
Learn how to install and configure Oracle products using response files.
- [Cloning an Oracle Home](#)  
Follow these steps to clone an Oracle home.

## Installing on Systems That Already Have Oracle Components

Perform the following steps when other components exist on your computer:

1. Log on as a member of the Administrators group for the computer on which you want to install Oracle components.  
  
If you are installing on a Primary Domain Controller (PDC) or a Backup Domain Controller (BDC), log on as a member of the Domain Administrators group.
2. Delete the `ORACLE_HOME` environment variable if it exists. See the Microsoft online help for more information about deleting environment variables.

#### Note:

The `ORACLE_HOME` environment variable is automatically set in the registry. Manually setting this variable prevents installation.

3. Back up any databases you must upgrade.

**See Also:**

*Oracle Real Application Clusters Installation Guide*

## Installing with Minimum Memory Requirements

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

- Computers cannot run Oracle Database Upgrade Assistant, Oracle Database Configuration Assistant, or Oracle Net Services Configuration Assistant during an Oracle Universal Installer installation session.
- Depending on how many applications run on the computer, you must further increase the paging file size or reduce the size of the System Global Area (SGA) if you run out of virtual memory. If temporary files and the paging file are both stored on the same physical drive, the space requirements for one can limit the size of the other. If your system has limited free space, first install the Oracle Database software. After the installation is finished, create a database with Oracle Database Configuration Assistant.

**Note:**

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

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

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

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



- Oracle Automatic Storage Management

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

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

- Installations on a cluster

If Oracle Clusterware or Oracle RAC is installed on the system, then Oracle Universal Installer displays the Grid Installation Options page. You must select **Single instance database installation**, unless you want to install Oracle RAC. The other options on the page are Oracle Real Application Clusters database installation and Oracle RAC One Node database installation.

 **See Also:**

*Oracle Real Application Clusters Installation Guide*

- [About Character Set Selection During Installation](#)  
Review character set options before you start the installation.
- [Using an Oracle Automatic Storage Management Disk Group](#)  
Learn how to identify disk groups and determine the available free disk space.

## About Character Set Selection During Installation

Review character set options before you start the installation.

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

Oracle Database uses character sets for the following:

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

Starting with Oracle Database 12c Release 2 (12.2), the default database character set of a database created from the General Purpose/Transaction Processing or the Data Warehousing template is Unicode AL32UTF8. Oracle recommends that you use Unicode AL32UTF8 as the database character set.

Unicode is the universal character set that supports most of the currently spoken languages of the world. It also supports many historical scripts (alphabets). Unicode is

the native encoding of many technologies, including Java, XML, XHTML, ECMAScript, and LDAP. Unicode is ideally suited for databases supporting the Internet and the global economy.

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

 **Note:**

English data may require more space only if stored in CLOB columns

The database character set of a multitenant container database (CDB) determines which databases can be plugged in later. Ensure that the character set you choose for the CDB is compatible with the database character sets of the databases to be plugged into this CDB.

 **See Also:**

*Oracle Database Globalization Support Guide*

## Using an Oracle Automatic Storage Management Disk Group

Learn how to identify disk groups and determine the available free disk space.

You can store either database or recovery files in an existing Oracle Automatic Storage Management disk group that you created during the Oracle Grid Infrastructure for a standalone server installation.

 **Note:**

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

1. In the **Services** Control Panel, ensure that the `OracleASMSERVICE+ASM` service has started.
2. Open command prompt and temporarily set the `ORACLE_SID` environment variable to specify the appropriate value for the Oracle Automatic Storage Management instance.

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

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

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

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

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

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

5. From the output, identify a disk group with the appropriate redundancy level and note the free space that it contains.
6. If necessary, install, or identify the additional disk devices required to meet the storage requirements.

 **Note:**

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

## Accessing the Installation Software

The Oracle software is available on the installation media or you can download it from the Oracle Technology Network website, or Oracle Software Delivery Cloud website.

To install the software from the hard disk, you must either download it and unpack it, or copy it from the installation media, if you have it.

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

- [Installing from a Remote DVD Drive](#)  
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.
- [Installing on Remote Computers Through Remote Access Software](#)  
If you want to install and run Oracle Database on a remote computer (that is, the remote computer has the hard drive and runs Oracle Database components), but you do not have physical access to the computer, you still can perform the installation on the remote computer if it is running remote access software such as VNC or Symantec pcAnywhere.
- [Downloading Oracle Software](#)  
You can download the trial version of the installation files from the Oracle Technology Network (OTN) or the Oracle Software Delivery Cloud portal and extract them on your hard disk.
- [Copying the Oracle Database Software to a Hard Disk](#)  
To copy the contents of the installation media 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.

- [Step 1: On the Remote Computer, Share the DVD Drive](#)  
The remote DVD drive must allow shared access.
- [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:

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

The remote DVD drive must allow shared access.

To set this up, perform these steps on the remote computer that has the DVD drive:

1. Log in to the remote computer as an Administrator user.
2. Start Windows Explorer.
3. Right-click the DVD drive letter and select **Sharing** (or **Sharing and Security**).
4. Click the **Sharing** tab and do the following:
  - a. Select **Share this folder**.
  - b. In **Share name**, give it a share name such as `dvd`. You use this name when you map the DVD drive on the local computer in step 1.d of "[Step 2: On the Local Computer, Map the DVD Drive](#)".
  - c. Click **Permissions**. You need at least read permission for the user who accesses the drive to install Oracle Database.
  - d. Click **OK** when you are finished.
5. Insert the Oracle Database installation media into the DVD drive.

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

Perform these steps on the local computer to map a remote DVD drive and to run Oracle Universal Installer from the mapped drive:

1. Map the remote DVD drive.
  - a. Start Windows Explorer on the local computer.
  - b. From the **Tools** menu, select **Map Network Drive** to display the Map Network Drive dialog box.
  - c. Select a drive letter to use for the remote DVD drive.
  - d. In **Folder**, enter the location of the remote DVD drive using the following format:

```
\\remote_hostname\share_name
```

where:

- *remote\_hostname* is the name of the remote computer with the DVD drive.
- *share\_name* is the share name that you entered in step 4 of the previous procedure. For example:

```
\\computer2\dvd
```

- e. If you must connect to the remote computer as a different user, click **different user name**, and enter the user name.
  - f. Click **Finish**.
2. Run Oracle Universal Installer from the mapped DVD drive.

### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Installing on Remote Computers Through Remote Access Software

If you want to install and run Oracle Database on a remote computer (that is, the remote computer has the hard drive and runs Oracle Database components), but you do not have physical access to the computer, you still can perform the installation on the remote computer if it is running remote access software such as VNC or Symantec pcAnywhere.

You also need the remote access software running on your local computer.

You can install Oracle Database on the remote computer in one of two ways:

- If you have copied the contents of the Oracle Database DVD to a hard drive, you can install the software from the hard drive.
- You can insert the DVD into a drive on your local computer, and install the software from the DVD.
- [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.
- [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.

## Installing on Remote Computers from a Hard Drive

If you have copied the contents of the Oracle Database DVD to a hard drive, you can install the software from the hard drive.

To install the software on a remote computer from a hard drive:

1. Ensure that the remote access software is installed and running on the remote and local computers.
2. Share the hard drive that contains the Oracle Database DVD.
3. On the remote computer, map a drive letter to the shared hard drive. You use the remote access software to do this on the remote computer.

4. Through the remote access software, run Oracle Universal Installer on the remote computer. You access Oracle Universal Installer from the shared hard drive.

#### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Installing on Remote Computers from a Remote DVD Drive

You can insert the DVD into a drive on your local computer, and install from the DVD.

To install the software on a remote computer from a remote DVD drive:

1. Ensure that the remote access software is installed and running on the remote and local computers.
2. On the local computer, share the DVD drive.  
  
On the remote computer, map a drive letter to the shared DVD drive. You use the remote access software to do this on the remote computer.
3. Through the remote access software, run Oracle Universal Installer on the remote computer. You access Oracle Universal Installer from the shared DVD drive.

#### Related Topics

- [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.
- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Downloading Oracle Software

You can download the trial version of the installation files from the Oracle Technology Network (OTN) or the Oracle Software Delivery Cloud portal and extract them on your hard disk.

Select the method that you want to use to download the software. Ensure that you review and understand the terms of the license. Most downloads include the development license.

- [Downloading the Installation Archive Files from Oracle Technology Network](#)  
To download the installation archive files from Oracle Technology Network:
- [Downloading the Software from Oracle Software Delivery Cloud](#)
- [Extracting the Installation Files](#)  
Use this procedure to extract the installation archive files.

## Downloading the Installation Archive Files from Oracle Technology Network

To download the installation archive files from Oracle Technology Network:

1. Use any browser to access the software download page from OTN at:  
`unilink:otn_download`

2. Navigate to the download page for the product to install.
3. On the download page, identify the required disk space by adding the file sizes for each required file.  
The file sizes are listed next to the file names.
4. Select a file system with enough free space to store and expand the archive files.  
In most cases, the available disk space must be at least twice the size of all of the archive files.
5. On the file system that you selected in step 4, create a parent directory for each product, for example `Oradb12c`, to hold the installation directories.
6. Download all of the installation archive files to the directory that you created in step 5.
7. Verify that the files you downloaded are the same size as the corresponding files on Oracle Technology Network. Also verify the checksums are the same as noted on Oracle Technology Network.
8. Extract the files in each directory that you just created.

#### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Downloading the Software from Oracle Software Delivery Cloud

You can download the software from Oracle Software Delivery Cloud as Media Packs. A Media Pack is an electronic version of the software that is also available to Oracle customers on CD-ROM or DVD. To download the Media Pack:

1. Use any browser to access the Oracle Software Delivery Cloud website:  
<http://edelivery.oracle.com/>
2. Complete the Export Validation process by entering information (name, company, e-mail address, and country) in the online form.
3. In the Media Pack Search page, specify the Product Pack and Platform to identify the Media Pack you want to download. If you do not know the name of the Product Pack, you can search for it using the License List.
4. Optionally, select the relevant product to download from the **Results** list.
5. In the search results page, click **Readme** to download and review the Readme file for download instructions and product information.
6. After you review the Readme, choose the appropriate Media Pack from the search results to download the individual zip files. Follow the Download Notes instructions in this page. Once you download and extract the contents of the required zip files, proceed with the installation of the software.

 **Note:**

Print the page with the list of downloadable files. It contains a list of part numbers and their corresponding descriptions to refer during the installation process.

7. After you download the files, click **View Digest** to verify that the MD5 or SHA-1 checksum matches with what is listed in the media download page.

 **See Also:**

- My Oracle Support note 549617.1 for information on how to verify the integrity of a software download at:

<https://support.oracle.com/CSP/main/article?cmd=show&type=NOT&id=549617.1>

- *Frequently Asked Questions* section on the Oracle Software Delivery Cloud website for more information about Media Packs

## Extracting the Installation Files

Use this procedure to extract the installation archive files.

To extract the installation archive files, perform the following steps:

1. If necessary, change to the directory that contains the downloaded installation archive files.
2. Oracle Database software is available as two zip files. Ensure that you extract both the zip files to the same directory.

### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Copying the Oracle Database Software to a Hard Disk

To copy the contents of the installation media to a hard disk:

1. Create a directory on your hard drive. For example:

```
C:\> mkdir \install  
C:\> mkdir \install\database
```

2. Copy the contents of the installation media to the directory that you just created.

### Related Topics

- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.



# Installing and Using Oracle Components in Different Languages

Learn about installing and using Oracle components in different languages.

- [Configuring Oracle Components to Run in Different Languages](#)  
You can specify the language and the territory, or locale, in which you want to use the Oracle components.
- [Installing Translation Resources](#)  
To view the user interface of Oracle components in different languages, you must install the appropriate language translations along with the component.

## Configuring Oracle Components to Run in Different Languages

You can specify the language and the territory, or locale, in which you want to use the Oracle components.

The locale setting of a component determines the language of the user interface of the component and the globalization behavior, such as date and number formatting. Depending on the Oracle component, the locale of the component is either inherited from the operating system session that started the component, or is defined by the `NLS_LANG` environment variable.

The operating system locale usually influences Oracle components that are based on Java technology. The `NLS_LANG` environment variable usually influences Oracle components that use Oracle Client libraries such as OCI.

### Note:

The user interface of an Oracle component is displayed in a selected language only if the appropriate translation is available and has been installed. Otherwise, the user interface is displayed in English.

- [Determining the Operating System Locale](#)  
The locale setting of your operating system session determines the language of the user interface and the globalization behavior for components such as Oracle Universal Installer, Oracle Net Configuration Assistant, and Oracle Database Configuration Assistant.
- [Configuring Locale and Character Sets Using the NLS\\_LANG Environment Variable](#)  
The `NLS_LANG` environment variable determines the language of the user interface and the globalization behavior for components such as SQL\*Plus, exp, and imp.
- [NLS\\_LANG Settings in Console Mode and Batch Mode](#)  
Before you can use Oracle utilities such as SQL\*Plus, SQL Loader, Import, and Export from the command prompt, you may have to set the character set in the parameter `NLS_LANG` to a different value from the one used in the registry.

## Determining the Operating System Locale

The locale setting of your operating system session determines the language of the user interface and the globalization behavior for components such as Oracle Universal Installer, Oracle Net Configuration Assistant, and Oracle Database Configuration Assistant.

It also determines the globalization behavior of Oracle Database sessions created by a user application through Oracle JDBC driver, unless overridden by the application.

Open the Control Panel from the Start menu to modify the operating system locale settings. In the classic view of the Control Panel on Windows, click **Regional and Language Options**. In the default view of the Control Panel on Windows, click **Change keyboards or other input methods**.

To set locale for the current operating system user on Windows, select the desired locale from the Current format pop-up list on the Formats tab.

Some of the locales may be unavailable until you install required operating system support files.

Some Oracle components, such as SQL\*Plus, require that the Windows System Locale is also set to the language in which the components are to be run. System Locale is called Language for non-Unicode programs on Windows. On Windows, click the **Change system locale...** button on the Administrative tab, accept the use of administrative privileges, if User Account Control is active, and select the locale from the pop-up list in the opened dialog box.

 **Note:**

The operating system must be restarted after the System Locale is changed. See the operating system documentation for further information about Windows locale settings.

## Configuring Locale and Character Sets Using the NLS\_LANG Environment Variable

The `NLS_LANG` environment variable determines the language of the user interface and the globalization behavior for components such as SQL\*Plus, exp, and imp.

It sets the language and territory used by the client application and the database user session. It also declares the character set for entering and displaying data by the client application.

The `NLS_LANG` environment variable uses the following format:

```
NLS_LANG=language_territory.characterset
```

In this format:

- *language* specifies the language used for displaying Oracle messages, sorting, day names, and month names

- *territory* specifies the conventions for default date, monetary and numeric formats
- *characteraset* specifies the encoding used by the client application

In most cases, this is the Oracle character set that corresponds to the Windows ANSI Code Page as determined by the System Locale.

The *NLS\_LANG* parameter on Windows can be set

- in Registry under the subkey corresponding to a given Oracle home,
- as an environment variable.

When you install Oracle Database components and the *NLS\_LANG* parameter is not yet set in the Registry subkey of the target Oracle home, Oracle Universal Installer sets the *NLS\_LANG* parameter to a default value derived from the operating system locale for the current user. See the following table.

### See Also:

- *Oracle Database Globalization Support Guide* for information about the *NLS\_LANG* parameter and Globalization Support initialization parameters

For example:

- Arabic (U.A.E.) - ARABIC\_UNITED ARAB EMIRATES.AR8MSWIN1256
- Chinese (PRC) - SIMPLIFIED CHINESE\_CHINA.ZHS16GBK
- Chinese (Taiwan) - TRADITIONAL CHINESE\_TAIWAN.ZHT16MSWIN950
- English (United Kingdom) - ENGLISH\_UNITED KINGDOM.WE8MSWIN1252
- English (United States) - AMERICAN\_AMERICA.WE8MSWIN1252
- French (Canada) - CANADIAN FRENCH\_CANADA.WE8MSWIN1252
- French (France) - FRENCH\_FRANCE.WE8MSWIN1252
- German (Germany) - GERMAN\_GERMANY.WE8MSWIN1252
- Hebrew - HEBREW\_ISRAEL.IW8MSWIN1255
- Japanese - JAPANESE\_JAPAN.JA16SJISTILDE
- Russian - RUSSIAN\_RUSSIA.CL8MSWIN1251
- Spanish (Spain) - SPANISH\_SPAIN.WE8MSWIN1252
- Spanish (Mexico) - MEXICAN SPANISH\_MEXICO.WE8MSWIN1252
- Spanish (Venezuela) - LATIN AMERICAN SPANISH\_VENEZUELA.WE8MSWIN1252

## NLS\_LANG Settings in Console Mode and Batch Mode

Before you can use Oracle utilities such as SQL\*Plus, SQL Loader, Import, and Export from the command prompt, you may have to set the character set in the parameter *NLS\_LANG* to a different value from the one used in the registry.

You may need to set a different character set for console mode utilities, because programs running in console mode use, with a few exceptions, a different code page

(character set) from programs running in GUI mode. The default Oracle home `NLS_LANG` parameter in the Registry is always set to the appropriate GUI code page. If you do not set the `NLS_LANG` parameter for the console mode session correctly, incorrect character conversion can corrupt error messages and data.

For Japanese, Korean, Simplified Chinese, Traditional Chinese, Thai, and Vietnamese, the console (OEM) code page is identical to the GUI (ANSI) code page. In this case, you are not required to set the `NLS_LANG` parameter. For other languages, set the correct character set value of `NLS_LANG` by issuing a `SET NLS_LANG` command in the same Command Prompt window in which you want to start the affected utility.

Similarly, in batch mode, set the correct character set value of `NLS_LANG` by inserting a `SET NLS_LANG` command at the start of the batch procedure, according to the character set of the files to be processed in the procedure.

To find the current console code page, issue the `CHCP` command in the Command Prompt window. Use the reported code page number to look up the corresponding Oracle character set name in the following table:

**Table 6-1 Oracle Character Sets for Console Mode (OEM) Code Pages**

OEM Code Page	Oracle Character Set for Console Mode
437 (US)	US8PC437
737 (Greek)	EL8PC737
775 (Baltic)	BLT8PC775
850 (Multilingual Latin I)	WE8PC850
852 (Latin II)	EE8PC852
855 (Cyrillic)	RU8PC855
857 (Turkish)	TR8PC857
858 (Multilingual Latin I + Euro)	WE8PC858
866 (Russian)	RU8PC866
874 (Thai)	TH8TISASCII
932 (Japanese Shift-JIS)	JA16SJISTILDE
936 (Simplified Chinese GBK)	ZHS16GBK
949 (Korean)	KO16MSWIN949
950 (Traditional Chinese Big5)	ZHT16MSWIN950
1258 (Vietnam)	VN8MSWIN1258

## Installing Translation Resources

To view the user interface of Oracle components in different languages, you must install the appropriate language translations along with the component.

 **Note:**

Part of Oracle Database Vault user interface text is stored in database tables in the DVSYS schema. By default, only the English language is loaded into these tables. You can use Oracle Database Vault Configuration Assistant to add more languages to Oracle Database Vault.

To install translation resources:

1. Start Oracle Universal Installer.
2. In the Configure Security Updates screen enter the relevant information and click **Next**.
3. In the Select Installation Option screen, select the installation option and click **Next**.
4. In the System Class screen, select the type of system class for installing the database, and click **Next**.
5. In the Grid Installation Options screen, select the type of database installation you want to perform, and click **Next**.

 **See Also:**

*Oracle Database Vault Administrator's Guide*

## Running Oracle Universal Installer in Different Languages

Describes how to run Oracle Universal Installer in other languages.

Your operating system locale determines the language in which Oracle Universal Installer runs. You can run Oracle Universal Installer in one of these languages:

- Brazilian Portuguese (pt\_BR)
- French (fr)
- German (de)
- Italian (it)
- Japanese (ja)
- Korean (ko)
- Simplified Chinese (zh\_CN)
- Spanish (es)
- Traditional Chinese (zh\_TW)

To run Oracle Universal Installer in a supported language, change the locale in which your operating system session is running before you start Oracle Universal Installer. If the selected language is not one of the supported languages, then Oracle Universal Installer runs in English.

1. Change the locale for the operating system user and the System Locale.

2. Run Oracle Universal Installer.

### Related Topics

- [Determining the Operating System Locale](#)  
The locale setting of your operating system session determines the language of the user interface and the globalization behavior for components such as Oracle Universal Installer, Oracle Net Configuration Assistant, and Oracle Database Configuration Assistant.
- [Installing Oracle Database](#)  
Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

## Installing Oracle Database

Oracle Database and Oracle Grid Infrastructure installation software is available on multiple media, and can be installed using several options.

The Oracle Database software is available on installation media, or you can download it from the Oracle Technology Network website, or the Oracle Software Delivery Cloud portal. In most cases, Oracle Universal Installer provides a graphical user interface (GUI) to install the software. However, you can also use Oracle Universal Installer to complete silent mode installations, without using the GUI.

### Note:

- If you plan to use Oracle Restart or Oracle Automatic Storage Management, then you must install Oracle Grid Infrastructure for a standalone server before you install and create the database. Otherwise, you must manually register the database with Oracle Restart. For information about installing Oracle Grid Infrastructure, see [Oracle Grid Infrastructure Installation and Configuration](#).
- You may have to shut down existing Oracle processes before you start the database installation.
- To install Oracle Database using the silent or response file installation method, without the GUI. It also explains how to clone an existing Oracle home. These methods are useful to perform multiple installations of Oracle Database.

To install the Oracle Database software:

1. Log in to Windows as an Administrator user.  
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 Network Interface Cards or multiple aliases, use **System** in the Control Panel to create the `ORACLE_HOSTNAME` system environment variable. Set this variable to point to the host name of the computer on which you are installing Oracle Database.

3. Navigate to the location of the installation media for Oracle Database 12c Release 2 (12.2), open a command prompt with administrator privileges, and run the `setup.exe` command.

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

4. Follow these guidelines to complete the installation:
  - Do not install Oracle Database 12c software into an existing Oracle home.
  - Follow the instructions displayed in the Oracle Universal Installer screens. If you need additional information, click **Help**.

 **Tip:**[Unlocking and Resetting User Passwords](#)

- 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 for information about troubleshooting.
- If you chose an installation type that runs Oracle Database Configuration Assistant in interactive mode, then you must provide detailed information about configuring your database and network.

If you need help when using the Oracle Database Configuration Assistant in interactive mode, click **Help** on any screen.

 **Note:**

If you chose a default installation, Oracle Database Configuration Assistant does not run interactively.

5. When the Configuration Assistant tasks are complete, click **Finish**, click **Exit**, then click **Yes** to exit from Oracle Universal Installer.
6. Optionally, delete the `OraInstalldate_time` directory to remove the temporary files that were created during the installation process. The `OraInstalldate_time` directory holds about 45 MB of files. This directory is created in the location set by the `TEMP` environment variable setting.

Restarting your computer also removes the `OraInstalldate_time` directory.

7. See for information about tasks that you must complete after you have installed Oracle Database.

The following table lists the various screens displayed during an Enterprise Edition installation for Oracle Database 12c:

**Table 6-2 Oracle Universal Installer Windows**

Screen	Action
Configure Security Updates	<p>Enter your e-mail address, preferably your My Oracle Support e-mail address or user name in the <b>Email</b> field.</p> <p>You can select the <b>I wish to receive security updates via My Oracle Support</b> check box to receive security updates.</p> <p>Enter your My Oracle Support password in the <b>My Oracle Support Password</b> field. Click <b>Next</b>.</p>
Select Installation Option	<p>Select one of the following installation options, click <b>Next</b>.</p> <ul style="list-style-type: none"> <li>• Create and configure a database: This option creates a new database along with sample schemas.</li> <li>• Install database software only: This option installs only the database binaries. To configure database, you must run Oracle Database Configuration Assistant after the software installation.</li> <li>• Upgrade an existing database: This option installs the software binaries in a new Oracle home. At the end of the installation, you can upgrade the existing database.</li> </ul>
System Class	<p>Select the type of system for installing the database, click <b>Next</b>.</p> <ul style="list-style-type: none"> <li>• Desktop Class: Choose this option if you are installing on a laptop or desktop class system. This option includes a starter database and enables minimal configuration. This option is designed for those who want to quickly set up a database.</li> <li>• Server Class: Choose this option if you are installing on a server class system, such as when deploying Oracle in a production data center. This option enables more advanced configuration options. Advanced configuration options available using this option include Oracle RAC, Oracle Automatic Storage Management, backup and recovery configuration, integration with Enterprise Manager Cloud Control, and more fine-grained memory tuning, among many others.</li> </ul>
Grid Installation Options	<p>Select the type of database installation you want to perform, click <b>Next</b>.</p> <ul style="list-style-type: none"> <li>• Single instance database installation: This option installs the database and the listener.</li> <li>• Oracle Real Application Clusters database installation: This option installs Oracle Real Application Clusters.</li> <li>• Oracle RAC One Node database installation: This option installs Oracle RAC One Node database.</li> </ul>
Select Install Type	<p>Select one of the following, then click <b>Next</b>:</p> <ul style="list-style-type: none"> <li>• Typical Install: This installation method is selected by default. It lets you quickly install Oracle Database using minimal input. It installs the software and optionally creates a general-purpose database using the information that you specify on this screen.</li> <li>• Advanced Install: This installation method enables you to perform more complex installations, such as creating individual passwords for different accounts, creating specific types of starter databases (for example, for transaction processing or data warehouse systems), using different language groups, specifying e-mail notifications, and so on.</li> </ul>
Select Database Edition	Select Enterprise Edition or Standard Edition 2. Click <b>Next</b>



Table 6-2 (Cont.) Oracle Universal Installer Windows

Screen	Action
Specify Oracle Home User	<p>Starting with Oracle Database 12c, Oracle recommends that you use Virtual Account or specify a standard Windows User Account (not an Administrator account) to install and configure the Oracle home. This account is used for running the Windows services for the Oracle home. Do not log in using this account to perform administrative tasks. Select one of the following, then click <b>Next</b>.</p> <ul style="list-style-type: none"> <li>• Use Virtual Account User The account is the Oracle Home User for Oracle Database Single Instance and Client installations. The account enables you to install Oracle Database, create, and manage database services without passwords.</li> <li>• Use Existing Windows User The account can be a Windows Local User, Windows Domain User, Windows Managed Services Account (MSA), or a Windows Group Managed Services Account (gMSA). You must provide both the user name and password for a Windows Local or Domain User. For a Windows MSA, which is a managed domain account, only the user name is required. For a Windows gMSA, which is also a managed domain account, only the user name is required.</li> <li>• Create New Windows User Provide the user name and password for the Windows Local User that you want Oracle Universal Installer to create. Confirm the password. The new user that is created is denied interactive logon privileges to the Windows computer. However, a Windows administrator can manage this account like any other Windows account.</li> </ul> <p>Select <b>Use Windows Built-in Account</b> if you do not want to specify an Oracle Home User during installation. No user name or password is required and the Windows services for the Oracle home run as the LocalSystem or LocalService.</p> <p>For Database Server installation, Oracle recommends that you use a standard Windows User Account (instead of Windows Built-in Account) or Virtual Account as the Oracle Home User for enhanced security.</p>
Specify Installation Location	<p>The Oracle base path appears by default. You can change the path based on your requirement. Specify <b>Oracle base</b>, <b>Software location</b>, and click <b>Next</b>.</p> <p>The Oracle base directory is a top-level directory for Oracle software installations owned by an Oracle installation owner account. The default Oracle base path is <i>DRIVE_LETTER:\app\user</i>, where <i>user</i> is the user account running the installation. You can change the path based on your requirements.</p> <p>In the <b>Software Location</b> field, accept the default value or enter the Oracle home directory path in which you want to install Oracle components. The directory path must not contain spaces.</p> <p>Click <b>Next</b>.</p> <p><b>Note:</b> This screen is available only with Advanced Installation.</p>
Select Configuration Type	<p>Select one of the following, click <b>Next</b>:</p> <ul style="list-style-type: none"> <li>• General Purpose / Transaction Processing: This is a starter database designed for general usage or transaction-heavy applications.</li> <li>• Data Warehousing: A starter database optimized to run Data Warehousing applications.</li> </ul> <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>

**Table 6-2 (Cont.) Oracle Universal Installer Windows**

Screen	Action
Specify Database Identifiers	<p>Specify the following information, then click <b>Next</b>:</p> <p>Database Naming</p> <p>Specify the Global Database Name using the following syntax:</p> <pre>database_unique_name.db_domain</pre> <p>where:</p> <ul style="list-style-type: none"><li>• <i>database_unique_name</i> is the name of the database. It can contain a maximum of 30 characters as long as the first eight characters are unique and begin with an alphabetic character. The characters can include ASCII alphanumeric (A-Za-Zz0-9), underscore ( _ ), dollar ( \$ ), and pound ( # ), no other special characters are permitted in a database name.</li><li>• <i>db_domain</i> is the computer environment used for the database. It must contain no more than 128 characters (ASCII alphanumeric (A-Za-Zz0-9), underscore ( _ ), and pound ( # )), inclusive of all periods.</li></ul> <p><b>Note:</b> Ensure that the combination of database name (first eight unique characters of database unique name), delimiter, and the database domain name does not exceed 128 characters.</p> <p>For example:</p> <pre>sales.us.example.com</pre> <p>where:</p> <ul style="list-style-type: none"><li>• <i>database_unique_name</i> is <i>sales</i></li><li>• <i>db_domain</i> is <i>us.example.com</i></li></ul> <p>When you enter the Global Database Name, Oracle Universal Installer automatically populates the SID prefix with the database name. You can change this name in Advanced installation.</p> <p>Oracle Universal Installer limits the SID to 12 alphanumeric characters and the SID cannot contain underscore ( _ ), dollar ( \$ ), and pound ( # ).</p> <p>Select the <b>Create as Container database</b> option to create the database as a multitenant container database (CDB) that can support one pluggable database (PDB). If you want Oracle Universal Installer to create a PDB when it creates the CDB, specify the PDB name in the <b>Pluggable Database Name</b> field.</p> <p>The PDB name must be unique and must follow the database naming conventions.</p> <p>To create additional PDBs and to manage PDBs, use Oracle Database Configuration Assistant.</p> <p><b>See Also:</b> <i>Oracle Database 2 Day DBA</i></p>

Table 6-2 (Cont.) Oracle Universal Installer Windows

Screen	Action
Specify Configuration Options	<p>Specify the following configuration details, then click <b>Next</b>.</p> <p><b>Memory:</b></p> <p>Select the <b>Enable Automatic Memory Management</b> option to allow the database to automatically distribute memory between SGA and PGA. If you do not select this option, then the SGA and PGA must be sized manually.</p> <p><b>Character Sets:</b></p> <p>This option enables you to select the character set used to store and process character data in the database. The choices are:</p> <ul style="list-style-type: none"> <li>• <b>Use Unicode (AL32UTF8):</b> The database character set is AL32UTF8 and the database can process most languages of the world.</li> <li>• <b>Use OS character set (WE8MSWN1252):</b> The database character set (WE8MSWN1252) is based on the language of the operating system.</li> <li>• Choose from the following list of character sets: This option enables the <b>Select database character set</b> drop down list.</li> </ul> <p><b>See Also:</b> <i>Oracle Database Globalization Support Guide</i></p> <p><b>Sample Schemas:</b></p> <p>The Create database with sample schemas option is not selected by default. However, you can select the option, to create the starter database with sample schema. If you create the database as a CDB with one PDB, then the sample schema is created as a PDB.</p> <p><b>Note:</b> By default, Oracle database is configured to include enhanced security settings.</p>
Specify Database Storage Options	<p>Select one of the following, then click <b>Next</b>.</p> <ul style="list-style-type: none"> <li>• File System: Specify the database file location.</li> <li>• Oracle Automatic Storage Management.</li> </ul>
Specify Management Options	<p>This screen gives you the option to manage your database using Oracle Enterprise Manager Cloud Control. Select <b>Register with Enterprise Manager (EM) Cloud Control</b> and specify the following for Oracle Enterprise Manager Cloud Control configuration, and click <b>Next</b>:</p> <ul style="list-style-type: none"> <li>• OMS Host: This is the system name where the Management repository is running.</li> <li>• OMS Port: This is the Oracle Enterprise Manager port number to receive requests from the Management service.</li> <li>• EM Admin User Name: This is the user name to log in to Oracle Enterprise Manager.</li> <li>• EM Admin Password: This is the password to log in to Oracle Enterprise Manager.</li> <li>• Specify password of ASMSNMP user: This is the password for the ASMSNMP user configured in Oracle ASM, required only if you choose Oracle ASM as your database storage option.</li> </ul> <p><b>Note:</b> Oracle Enterprise Manager Database Express is always installed and configured by default irrespective of whether you register Oracle Enterprise Manager Cloud Control.</p>
Specify Recovery Options	<p>Select <b>Enable Recovery</b> to enable recovery using one of the following options:</p> <ul style="list-style-type: none"> <li>• Select <b>File System</b> to use a file system directory for the fast recovery area, and then specify the fast recovery area path in the <b>Recovery Area location</b> field.</li> <li>• Select <b>Oracle Automatic Storage Management</b> to use an Automatic Storage Management disk group for the fast recovery area.</li> </ul> <p>Click <b>Next</b>.</p>

**Table 6-2 (Cont.) Oracle Universal Installer Windows**

Screen	Action
Select ASM Disk Group	<p>This screen is displayed only if you select Oracle Automatic Storage Management as your storage option.</p> <p>Disk groups are created during the Oracle Grid Infrastructure installation. Disk groups are configured with the <code>SYSASM</code> privilege using <code>asmcmd</code> or SQL <code>create diskgroup</code> commands. An ASM disk group consists of multiple disk partitions.</p> <p>The table in this screen displays existing disk groups created during the Oracle Grid Infrastructure installation. Select a disk group to use for database file storage.</p>
Specify Schema Passwords	<p>Enter and confirm passwords for the privileged database accounts: SYS, SYSTEM, and DBSNMP.</p> <p>If you chose to create the database as a CDB, then Oracle Universal Installer also asks for the PDBADMIN password.</p> <p>Click <b>Next</b>.</p> <p><b>Note:</b> 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.</p>
Perform Prerequisite Checks	<p>This option checks if the minimum system requirements to perform the database installation are met.</p> <p>Click <b>Fix &amp; Check Again</b>, if you want the installer to fix the problem and check the system requirements once more.</p> <p>If you click <b>Check Again</b>, then you can run the prerequisite check again to see if the minimum requirements are met to carry on with the database installation.</p> <p>To get a list of failed requirements, select <b>Show Failed</b> from the list. To get a list of all the prerequisite checks run by the OUI, select <b>Show All</b>. To get a list of the prerequisite checks that are successful, select <b>Show Succeeded</b>.</p> <p><b>Note:</b> Oracle recommends that you use caution in checking the <b>Ignore All</b> option. If you check this option, then Oracle Universal Installer may not confirm that your system can install Oracle Database successfully.</p> <p><b>See Also:</b> for information about the system requirements.</p>
Summary	<p>Review the information displayed on this screen, and click <b>Install</b>.</p> <p><b>Note:</b> You can save all the installation steps into a response file by clicking <b>Save Response File</b>. Later, this file can be used for a silent installation.</p>
Install Product	<p>This screen displays the progress of a database installation. It also shows the status information while the product is being installed. Click <b>Next</b>.</p> <p>This screen then displays the status information for the configuration assistants that configure the software and create a database. When the message is displayed after Database Configuration Assistant process, click <b>OK</b> to continue.</p>
Finish	<p>This screen is shown automatically when all the configuration tools are successful.</p>

**Related Topics**

- [Identifying Databases](#)  
The Oracle Database software identifies a database by its global database name.
- [Consider Memory Allocation and Automatic Memory Management](#)  
During a Typical installation, you create your database with Database Configuration Assistant (DBCA), and automatic memory management is enabled. If you choose advanced installation, then you can either specify memory allocation manually, or enable automatic memory management.

- [About Character Set Selection During Installation](#)  
Review character set options before you start the installation.
- [Using an Oracle Automatic Storage Management Disk Group](#)  
Learn how to identify disk groups and determine the available free disk space.
- [Configuring Storage for Oracle Automatic Storage Management](#)  
Identify storage requirements and ASM disk group options.
- [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.

#### Related Topics

- [Stopping Existing Oracle Services](#)  
Learn how to stop all processes, including the listener and database, running in the Oracle home.

#### See Also:

- *Oracle Grid Infrastructure Installation and Upgrade Guide for Microsoft Windows x64 (64-Bit)*

## Cloning an Oracle Home

Follow these steps to clone an Oracle home.

#### Note:

During cloning, Oracle Universal Installer (OUI) prompts you to run scripts that require root privileges.

1. Verify that the installation of Oracle Database to clone is successful.

You can do this by reviewing the `installActionsdate_time.log` file for the installation session, which is typically located in the following directory:

```
C:\Program Files\Oracle\Inventory\logs
```

If you have installed patches, you can check their status by running the following commands at a command prompt:

```
C:\ORACLE_HOME\OPatch> set ORACLE_HOME=ORACLE_HOME_using_patch  
C:\ORACLE_HOME\OPatch> opatch lsinventory
```

2. Stop all processes related to the Oracle home.

You can stop Oracle services by using one of the following methods:

- **Oracle Administration Assistant for Windows:** From the **Start** menu, select **All Programs**, then **Oracle - HOMENAME**, then **Configuration and Migration Tools**, then **Administrative Assistant for Windows**, then **Oracle**

**Managed Objects**, then **Computers**, and then *machine-name*. Select **Databases**, then right-click *global database name*, select **Stop Service**.

 **Note:**

Choose Startup/Shutdown Options to control whether a database instance must be stopped along with the service.

- **Microsoft Windows Services utility:** From the **Start** menu, select **Control Panel**, then **Administrative Tools**, then **Services**. Right-click any service that begins with **Oracle**, and then from the menu, select **Stop**.
3. Create a ZIP file with the Oracle home (but not Oracle base) directory.  
For example, if the source Oracle installation is in `C:\app\username\product\12.2.0\dbhome_1` you zip the `dbhome_1` directory, leaving out the `admin`, `flash_recovery_area`, and `oradata` directories that are under `12.2.0`. These directories are created in the target installation later on when you create a new database there.
  4. Copy the ZIP file to the root directory of the target computer. If you use File Transfer Protocol (FTP), then transfer the ZIP file in binary mode only.
  5. Extract the ZIP file contents, selecting the **Use folder names** option.
  6. Repeat steps 4 and 5 for each computer where you want to clone the Oracle home, unless the Oracle home is on a shared storage device.
  7. In the source Oracle home, restart the services that you stopped in step 2.
  8. On the target computer, `cd` to the unzipped Oracle home directory, and perform the following steps:
    - a. Remove the `*.ora` files that are present in unzipped `ORACLE_HOME\network\admin` directory, such as `listener.ora`, `sqlnet.ora`, and `tnsnames.ora`.
    - b. Delete unnecessary files from the unzipped Oracle home directory.

The unzipped Oracle home directory contains files that are relevant only to the source Oracle home. Remove the unnecessary files from the unzipped Oracle home in the `log`, `crs/init`, `crf`, and `cdat` directories. The following example shows how to remove these unnecessary files from the unzipped Oracle home directory:

```
[grid_home]# cd copy_path
[grid_home]# rm -rf host_name
[grid_home]# rm -rf log/host_name
[grid_home]# rm -rf gpnw/host_name
[grid_home]# rm -rf find gpnw -type f -exec rm -f {} \;
c:\<Gridhome> c:\mksnt\find gpnw -type f and delete these files.
gpnw/init/host_name
gpnw/init/host_name.pid
    gpnw/profiles/peer/profile.xml
gpnw/profiles/peer/profile_orig.xml
gpnw/host_name/profiles/peer/profile.old
gpnw/host_name/profiles/peer/profile.xml
    gpnw/host_name/profiles/peer/profile_orig.xml
gpnw/host_name/wallets/pa/cwallet.sso
gpnw/host_name/wallets/peer/cwallet.sso
gpnw/host_name/wallets/prdr/cwallet.sso
```

```

gpnw/host_name/wallets/root/ewallet.p12
gpnw/wallets/pa/cwallet.sso
gpnw/wallets/peer/cwallet.sso
gpnw/wallets/prdr/cwallet.sso
gpnw/wallets/roor/ewallet.p12

[grid_home]# find cfgtoollogs -type f -exec rm -f {} \;
[grid_home]# rm -rf crs/init/*
[grid_home]# rm -rf cdata/*
[grid_home]# rm -rf crf/*
[grid_home]# rm -rf network/admin/*.ora

```

- From the `ORACLE_HOME\clone\bin` directory, run `clone.pl` for the unzipped Oracle home.

Use the following syntax:

```

C:\ORACLE_HOME\clone\bin>target_home\perl\bin\perl.exe clone.pl
ORACLE_HOME="target location" ORACLE_BASE="target Base location"
ORACLE_HOME_USER="Windows User Account" OSDBA_GROUP=OSDBA_privileged_group
OSOPER_GROUP=OSOPER_privileged_group
OSBACKUPDBA_GROUP=OSBACKUPDBA_privileged_group
OSRACDBA_GROUP=OSRACDBA_privileged_group -defaultHomeName

```

where `ORACLE_HOME_USER="Windows User Account"` is the Oracle Home User for the cloned home.

Windows Built-in Account is used as the Oracle Home User if the parameter for `ORACLE_HOME_USER` is not specified.

For example:

```

C:\ORACLE_HOME\clone\bin>target_home\perl\bin\perl.exe clone.pl

ORACLE_HOME="C:\app\username\product\12.2.0\dbhome_1"
ORACLE_BASE="C:\app\username"
ORACLE_HOME_USER="mydomain\username" -defaultHomeName
OSDBA_GROUP=dba OSOPER_GROUP=oper OSBACKUPDBA_GROUP=backupdba
OSRACDBAGROUP=racdba -defaultHomeName

```

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`.

#### Note:

Run `\ORACLE_HOME\clone\bin>target_home\perl\bin\perl.exe clone.pl -help` command for more information about the command option flags.

- To configure connection information for the new database, run Net Configuration Assistant.  
To start Net Configuration Assistant, select **Start**, then **All Programs**, then **Oracle - HOMENAME**, then **Configuration and Migration Tools**, and then **Net Configuration Assistant**.
- To create a new database for the newly cloned Oracle home, run Oracle Database Configuration Assistant.

To start Oracle Database Configuration Assistant, select **Start**, then **All Programs**, then **Oracle - *HOMENAME***, then **Configuration and Migration Tools**, and then **Database Configuration Assistant**.

- [Configuring Oracle Configuration Manager in a Cloned Oracle Home](#)  
Configuring Oracle Configuration Manager for a cloned Oracle home depends on its configuration in the original Oracle home.

 **See Also:**

- *Oracle Database Administrator's Guide*
- *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX*

## Configuring Oracle Configuration Manager in a Cloned Oracle Home

Configuring Oracle Configuration Manager for a cloned Oracle home depends on its configuration in the original Oracle home.

If you have already installed but not configured Oracle Configuration Manager in the original Oracle home, then follow these steps:

1. Run the following commands from the cloned Oracle home:

```
DRIVE_LETTER:\> cd %ORACLE_HOME%\ccr\bin  
DRIVE_LETTER:\> setupCCR
```

2. Provide your My Oracle Support credentials to proceed.

If you have already configured Oracle Configuration Manager in the original Oracle home, then follow these steps:

1. Run the following commands from the cloned Oracle home:

```
DRIVE_LETTER:\> cd %ORACLE_HOME%\ccr\bin  
DRIVE_LETTER:\> deriveCCR
```

2. `deriveCCR` prompts for your My Oracle Support (MOS) credentials to proceed only if it cannot find the original configuration; otherwise it does not prompt.



# 7

## Oracle Database Postinstallation Tasks

Complete configuration tasks after you install Oracle Database.

Oracle recommends that you complete additional tasks immediately after installation. You must also complete product-specific configuration tasks before you use those products.

- [Using Oracle9i Language and Definition Files with Oracle Database 12c](#)  
Changes are made to the content of some of the language and territory definition files in Oracle Database 10g and later releases.
- [Downloading and Installing Patch Updates](#)  
Download and install patch dates for your Oracle software after you complete the installation.
- [Requirements for Database Password](#)  
To secure your database, every password must satisfy the Oracle recommended password requirements, even the passwords for predefined user accounts.
- [Downloading and Installing the ORAchk Health Check Tool](#)  
Download and install the ORAchk utility to perform proactive health checks for the Oracle software stack.
- [Recompiling Invalid Objects on Windows Systems](#)  
Run the `utlrp.sql` script after you install, patch, or upgrade a database, to identify, and recompile invalid objects.
- [Configuring the Secure Sockets Layer](#)  
Oracle highly recommends that you configure and use a Secure Sockets Layer (SSL) to ensure that passwords and other sensitive data are not transmitted in clear text in HTTP requests.
- [Configuring Oracle Components](#)  
Many Oracle products and options must be configured before you use them for the first time.
- [Creating a Fast Recovery Area Disk Group](#)  
During installation, by default you can create multiple disk groups.
- [Enabling and Disabling Database Options After Installation](#)  
When you install Oracle Database, some options are enabled and the others disabled. You can view the enabled Oracle Database options by querying the `V$OPTION` view using `SQL*Plus`.
- [Changing the Oracle Home User Password](#)  
Oracle Home User Control is a command-line utility that allows an administrator to update the password for an Oracle Home User.
- [Postinstallation Tasks for SQL Developer](#)  
Learn about the recommended postinstallation tasks for SQL Developer.

## Downloading and Installing the ORAchk Health Check Tool

Download and install the ORAchk utility to perform proactive health checks for the Oracle software stack.

ORAchk replaces the RACCheck utility. ORAchk extends health check coverage to the entire Oracle software stack, and identifies and addresses top issues reported by Oracle users. ORAchk proactively scans for known problems with Oracle products and deployments, including the following:

- Standalone Oracle Database
- Oracle Grid Infrastructure
- Oracle Real Application Clusters
- Maximum Availability Architecture (MAA) Validation
- Upgrade Readiness Validations
- Oracle Golden Gate

Oracle is continuing to expand checks, based on customer requests.

ORAchk is supported on Windows Server 2012 and Windows Server 2016 on a Cygwin environment only.

Oracle recommends that you download and run the latest version of ORAchk from My Oracle Support. For information about downloading, configuring and running ORAchk utility, refer to My Oracle Support note 1268927.2:

<https://support.oracle.com/epmos/faces/DocContentDisplay?id=1268927.2&parent=DOCUMENTATION&sourceId=USERGUIDE>

### Related Topics

- *Oracle ORAchk and EXAchk User's Guide*

## Using Oracle9i Language and Definition Files with Oracle Database 12c

Changes are made to the content of some of the language and territory definition files in Oracle Database 10g and later releases.

Changes are made to the content of some of the language and territory definition files in Oracle Database 10g and later releases. These updates are necessary to correct the legacy definitions that no longer meet the local conventions in some of the languages and territories that Oracle Database supports.

Oracle Database 12c customers must review their existing application code to ensure that the correct cultural conventions, which were introduced and defined in Oracle Database 10g, are being used.

For customers who are not able to make the necessary code changes to support their applications, Oracle Database offers Oracle9i locale definition files with this release of Oracle Database. If the Oracle Database server installation has been configured to use the Oracle9i files, then you must enable this functionality in each client installation as well.

To enable this functionality, perform the following steps:

1. Run the `cr9idata.pl` script, which by default is in the following location:

```
ORACLE_HOME\nls\data\old
```

If the installation type you chose does not include this directory, you can find the `cr9idata.pl` script in the same directory path in a default Oracle Database Client installation.

2. Set the `ORA_NLS10` environment variable to point to the directory `ORACLE_HOME\nls\data\9idata`, into which `cr9idata.pl` copies the new language and territory definition files. `ORA_NLS10` must have this value each time the affected client programs are started. Therefore, set the variable permanently in a startup script or, on the Microsoft Windows platform, set it in the Windows Registry.

## Downloading and Installing Patch Updates

Download and install patch dates for your Oracle software after you complete the installation.

Check the My Oracle Support website for required patch updates for your installation.

To download the required patches, perform the following steps:

1. Use a web browser to view the My Oracle Support website:

<https://support.oracle.com/>

2. Log in to My Oracle Support.

### Note:

If you are not a My Oracle Support registered user, then click **Register here** and follow the registration instructions.

3. On the main My Oracle Support page, click **Patches and Updates** tab.
4. In the Patch Search group, select **Product or Family (Advanced)**.
5. In the Product field, select **Oracle Database**.
6. In the Release field select the release number. For example, Oracle 12.2.0.1.0.
7. Click **Search**.
8. Any available patch updates are displayed in the Patch Search page.
9. Select the patch number and click **ReadMe**. The README page is displayed and contains information about the patch set and how to apply the patches to your installation.
10. Return to the Patch Search page, click **Download**, and save the file on your system.
11. Use the unzip utility provided with Oracle Database 12c to uncompress the Oracle patch updates that you downloaded from My Oracle Support. The unzip utility is located in the `ORACLE_BASE\ORACLE_HOME\bin` directory.

## Requirements for Database Password

To secure your database, every password must satisfy the Oracle recommended password requirements, even the passwords for predefined user accounts.

Oracle Database provides a set of predefined user accounts. You must create passwords in a secure fashion. If you have default passwords, you must change these.

You can manage the security for Oracle Database users by enforcing restrictions on the passwords that are created, creating user profiles, and using user resource limits to further secure user accounts.



### See Also:

*Oracle Database Security Guide*

## Recompiling Invalid Objects on Windows Systems

Run the `utlrp.sql` script after you install, patch, or upgrade a database, to identify, and recompile invalid objects.

The `utlrp.sql` script recompiles all invalid objects, including packages, procedures, and types. Run the script immediately after installation, to ensure that users do not encounter invalid objects.

1. Log in as an Administrator user, or as the Oracle Home user.
2. Start SQL\*Plus and log in as a SYSDBA user:
  - a. Click **Start**.
  - b. Select **Programs** (or **All Programs**).
  - c. Select **Oracle - HOME\_NAME**.
  - d. Select **Application Development**.
  - e. Select **SQL\*Plus**.
3. Run the `utlrp.sql` script, where `Oracle_home` is the Oracle home path:

```
SQL> @Oracle_home\rdbms\admin\utlrp.sql
```

The `utlrp.sql` script automatically recompiles invalid objects in either serial or parallel recompilation, based on the number of invalid objects, and on the number of CPUs available. CPUs are calculated using the number of CPUs (`cpu_count`) multiplied by the number of threads for each CPU (`parallel_threads_per_cpu`). On Oracle Real Application Clusters (Oracle RAC), this number is added across all Oracle RAC nodes.

## Configuring the Secure Sockets Layer

Oracle highly recommends that you configure and use a Secure Sockets Layer (SSL) to ensure that passwords and other sensitive data are not transmitted in clear text in HTTP requests.

### See Also:

*Oracle Database Security Guide*

## Configuring Oracle Components

Many Oracle products and options must be configured before you use them for the first time.

Before using individual Oracle products or options, refer to the appropriate manual in the product documentation library.

### Note:

Perform postinstallation tasks only for the components that you intend to use.

- [Configuring Direct NFS Client](#)  
Direct NFS Client is an alternative to using kernel-managed NFS.
- [Configuring Oracle Messaging Gateway](#)  
Oracle Messaging Gateway, an Oracle Database Advanced Queuing feature, requires additional configuration after you install Oracle Database if you plan to use Oracle Database Advanced Queuing.
- [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.
- [Configuring Oracle Label Security](#)  
You must configure Oracle Label Security in a database to use it.
- [Configuring the OraClrAgnt Service for Oracle Database Extensions for .NET](#)  
Oracle Database Extensions for .NET depends on a Windows service to operate properly. This service is called the OraClrAgnt service, which can be accessed through the Service Control Panel, as `OracleORACLE_HOMEClrAgent`, where `ORACLE_HOME` represents an Oracle home name.
- [Configuring Oracle Database Vault](#)  
Oracle Database includes Database Vault by default, but you must register it before you can use it.
- [Configuring Oracle Net Services](#)  
Describes how to configure Oracle Net Services.

- [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.
- [Installing the Oracle Text Filtering Component](#)  
Oracle Text Filtering Technology requires the Visual C++ libraries included in the Visual C++ Redistributable Package provided by Microsoft.
- [Configuring or Reinstalling Oracle XML DB](#)  
Oracle XML DB is a component of the Oracle Database installation.
- [Configuring PL/SQL External Procedures](#)  
Configuring PL/SQL depends on the network configuration files used.
- [Configuring Shared Server Support](#)  
The default setup for using the Shared Server mode depends on how the software has been installed.
- [Setting Credentials for the Job System to Work with Oracle Enterprise Manager](#)  
Windows systems require that you set the correct credentials for the Jobs system to work properly in Oracle Enterprise Manager.
- [Configuring Oracle Database to Communicate with Oracle Automatic Storage Management](#)  
On Windows, Oracle Database installations that use Oracle Automatic Storage Management must use Windows native authentication.
- [Installing Oracle Database Examples](#)  
If you plan to use the following products or features, then download and install the products from the Oracle Database Examples media:
- [Creating the OraMTS Service for Microsoft Transaction Server](#)  
Oracle Services for Microsoft Transaction Server (OraMTS) permit Oracle databases to be used as resource managers in Microsoft application coordinated transactions.



#### See Also:

- *Oracle Application Express Installation Guide*
- *Oracle Configuration Manager Installation and Administration Guide*

## Configuring Direct NFS Client

Direct NFS Client is an alternative to using kernel-managed NFS.

- [About Direct NFS Client Storage](#)  
With Oracle Database, you can store data files on a supported NFS system. You can configure Oracle Database to access NFS servers directly using an Oracle internal Direct NFS Client.
- [About the Oranfstab File for Direct NFS Client](#)  
To enable the Direct NFS Client, you must add an `oranfstab` file to `ORACLE_HOME` \dbs.

- [Mounting NFS Storage Devices with Direct NFS Client](#)  
Direct NFS Client determines the mount point settings for the NFS storage devices based on the configuration information in `oranfstab`.
- [Specifying Network Paths for a NFS Server](#)  
Direct NFS Client can use up to four network paths defined in the `oranfstab` file for an NFS server.
- [Creating an `oranfstab` File for Direct NFS Client](#)  
Direct NFS uses a configuration file, `oranfstab`, to determine the available mount points.
- [Performing Basic File Operations Using the ORADNFS Utility](#)  
ORADNFS is a utility which enables the database administrators to perform basic file operations over Direct NFS Client on Microsoft Windows platforms.
- [Monitoring Direct NFS Client Usage](#)  
Use the following views for Direct NFS Client management:
- [Enabling Direct NFS Client](#)  
To enable Direct NFS Client, you must add an `oranfstab` file to the `Oracle_home \dbs` directory and modify the related DLL files used by the Oracle Database software.
- [Disabling Direct NFS Client](#)  
Complete the following steps to disable the Direct NFS Client:
- [Enabling HCC on Direct NFS Client](#)  
To enable Hybrid Columnar Compression (HCC) on Direct NFS Client, perform the following steps:

## About Direct NFS Client Storage

With Oracle Database, you can store data files on a supported NFS system. You can configure Oracle Database to access NFS servers directly using an Oracle internal Direct NFS Client.

Direct NFS Client supports NFSv3, NFSv4, NFSv4.1, and pNFS protocols to access the NFS server. If Oracle Database cannot open an NFS server using Direct NFS Client, then an informational message is logged into the Oracle alert and trace files indicating that Direct NFS Client could not be established.

Starting with Oracle Database 12c Release 2, when you enable Direct NFS, you can access Direct NFS dispatcher. The Direct NFS dispatcher consolidates the number of TCP connections that are created from a database instance to the NFS server. In large database deployments, using Direct NFS dispatcher improves scalability and network performance. Parallel NFS deployments also require a large number of connections. Hence, the Direct NFS dispatcher is recommended with Parallel NFS deployments too.

Direct NFS Client supports Dispatcher or the Input/Output (I/O) infrastructure. Dispatcher enables database processes to use I/O slave processes to perform I/O operations. This limits the number of sockets and Transmission Control Protocol (TCP) connections that the Direct NFS Client requires to connect to the NFS server.

Starting with Oracle Database 12c Release 2 (12.2), Windows Direct NFS Client supports all widely accepted NFS path formats including UNIX-style NFS paths, NFS version 4, and NFS version 4.1 protocols.

The Oracle database files resident on the NFS server that are served by the Direct NFS Client can also be accessed through a third party NFS client. The volume must be mounted through CIFS or kernel NFS to enable regular windows utilities and commands, such as copy, and so on, access the database files in the remote location. Volumes mounted through CIFS cannot be used for database file storage without configuring Direct NFS Client. The atomic write requirements required for database access are not guaranteed by CIFS protocol. Consequently, CIFS can only be used for the operating system level commands, such as copy, move, and so on.

Some NFS file servers require NFS clients to connect using reserved ports. If your filer is running with reserved port checking, then you must disable it for Direct NFS Client to operate. To disable reserved port checking, consult your NFS file server documentation.

### Related Topics

- [Creating an oranfstab File for Direct NFS Client](#)  
Direct NFS uses a configuration file, `oranfstab`, to determine the available mount points.

#### See Also:

- *Oracle Database Reference*
- *Oracle Database Performance Tuning Guide*
- *Oracle Database Administrator's Guide*

## About the Oranfstab File for Direct NFS Client

To enable the Direct NFS Client, you must add an `oranfstab` file to `ORACLE_HOME\dbs`.

When `oranfstab` is placed in this directory, the entries in this file are specific to a single database.

## Mounting NFS Storage Devices with Direct NFS Client

Direct NFS Client determines the mount point settings for the NFS storage devices based on the configuration information in `oranfstab`.

Direct NFS Client looks for the mount point entries in `ORACLE_HOME\dbs\oranfstab`. It uses the first matched entry as the mount point.

## Specifying Network Paths for a NFS Server

Direct NFS Client can use up to four network paths defined in the `oranfstab` file for an NFS server.

The Direct NFS Client performs load balancing across all specified paths. If a specified path fails, then Direct NFS Client reissues I/O commands over any remaining paths.

Direct NFS Client requires an NFS server supporting NFS read/write buffers of at least 16384 bytes.



Direct NFS Client issues writes at `wtmax` granularity to the NFS server. Direct NFS Client does not serve an NFS server with a `wtmax` less than 16384. Oracle recommends that you use the value 32768.

For NFS servers that restrict port range, you can use the `insecure` option to enable clients other than `root` to connect to the NFS server. Alternatively, you can disable Direct NFS Client.

 **Note:**

Use NFS servers supported for Oracle Database. See the My Oracle Support website for support information:

<https://support.oracle.com>

**Related Topics**

- [Disabling Direct NFS Client](#)  
Complete the following steps to disable the Direct NFS Client:

## Creating an `oranfstab` File for Direct NFS Client

Direct NFS uses a configuration file, `oranfstab`, to determine the available mount points.

Create an `oranfstab` file with the following attributes for each NFS server that you want to access using Direct NFS Client:

- `server`  
The NFS server name.
- `local`  
Up to four paths on the database host, specified by IP address or by name, as displayed using the `ifconfig` command run on the database host.
- `path`  
Up to four network paths to the NFS server, specified either by IP address, or by name, as displayed using the `ifconfig` command on the NFS server.
- `export`  
The exported path from the NFS server. Use UNIX-style path.
- `mount`  
The corresponding local mount point for the exported volume. Use WINDOWS-style path.
- `Dontroute`  
Specifies that the outgoing messages must not be routed by the operating system, but sent using the IP address to which they are bound.
- `mnt_timeout`

Specifies (in seconds) the time Direct NFS Client should wait for a successful mount before timing out. This parameter is optional. The default timeout is 10 minutes (600).

- `uid` (Optional)

The UNIX user ID to be used by Direct NFS Client to access all NFS servers listed in `oranfstab`. The default value is `uid:65534`, which corresponds to `user:nobody` on the NFS server.

- `gid` (Optional)

The UNIX group ID to be used by Direct NFS Client to access all the NFS servers listed in `oranfstab`. The default value is `gid:65534`, which corresponds to `group:nogroup` on the NFS server.

- `nfs_version`

Specifies the NFS protocol version used by Direct NFS Client. Possible values are NFSv3, NFSv4, NFSv4.1, and pNFS. The default version is NFSv3. If you select NFSv4.x, then you must configure the value in `oranfstab` for `nfs_version`. Specify `nfs_version` as `pNFS`, if you want to use Direct NFS with Parallel NFS.

- `security_default` (Optional)

Specifies the default security mode applicable for all the exported NFS server paths for a server entry. The default value is `sys`. See the description of the `security` parameter for the supported security levels for the `security_default` parameter.

- `security` (Optional)

Specifies the security level, to enable security using Kerberos authentication protocol with Direct NFS Client. Specify `security` per export-mount pair. The supported security levels for the `security_default` and `security` parameters are:

`sys`: UNIX level security AUTH\_UNIX authentication based on user identifier (UID) and group identifier (GID) values. This is the default value for security parameters.

`krb5`: Direct NFS runs with plain Kerberos authentication. Server is authenticated as the real server which it claims to be.

`krb5i`: Direct NFS runs with Kerberos authentication and NFS integrity. Server is authenticated and each of the message transfers is checked for integrity.

`krb5p`: Direct NFS runs with Kerberos authentication and NFS privacy. Server is authenticated, and all data is completely encrypted.

The `security` parameter, if specified, takes precedence over the `security_default` parameter. If neither of these parameters are specified, then `sys` is the default authentication.

For NFS server Kerberos security setup, review the relevant NFS server documentation. For Kerberos client setup, review the relevant operating system documentation.

- `management`

Enables Direct NFS Client to use the management interface for SNMP queries. You can use this parameter if SNMP is running on separate management interfaces on the NFS server. The default value is the server parameter value.

- `community`

Specifies the community string for use in SNMP queries. Default value is `public`.

The following examples show three possible NFS server entries in `orantstab`. A single `orantstab` can have multiple NFS server entries.

### Example 7-1 Using Local and Path NFS Server Entries

The following example uses both local and path. Because they are in different subnets, you do not have to specify `dontroute`.

```
server: MyDataServer1
local: 192.0.2.0
path: 192.0.2.1
local: 192.0.100.0
path: 192.0.100.1
export: /vol/oradata1 mount: C:\APP\ORACLE\ORADATA\ORCL
```

### Example 7-2 Using Names in Place of IP Addresses, with Multiple Exports, management and community

```
server: MyDataServer2
local: LocalPath1
path: NfsPath1
local: LocalPath2
path: NfsPath2
local: LocalPath3
path: NfsPath3
local: LocalPath4
path: NfsPath4
nfs_version: nfsv3
dontroute
export: /vol/oradata2 mount: C:\APP\ORACLE\ORADATA\ORCL2
export: /vol/oradata3 mount: C:\APP\ORACLE\ORADATA\ORCL3
export: /vol/oradata4 mount: C:\APP\ORACLE\ORADATA\ORCL4
export: /vol/oradata5 mount: C:\APP\ORACLE\ORADATA\ORCL5
management: MgmtPath1
community: private
```

### Example 7-3 Using Kerberos Authentication with Direct NFS Export

The `security` parameter overrides `security_default`:

```
server: nfsserver
local: 192.0.2.0
path: 192.0.2.2
local: 192.0.2.3
path: 192.0.2.4
export: /vol/oradata2 mount: C:\APP\ORACLE\ORADATA\ORCL2 security: krb5
export: /vol/oradata3 mount: C:\APP\ORACLE\ORADATA\ORCL3 security: krb5p
export: /vol/oradata3 mount: C:\APP\ORACLE\ORADATA\ORCL4 security: sys
export: /vol/oradata3 mount: C:\APP\ORACLE\ORADATA\ORCL5
security_default: krb5i
```

## Performing Basic File Operations Using the ORADNFS Utility

ORADNFS is a utility which enables the database administrators to perform basic file operations over Direct NFS Client on Microsoft Windows platforms.

ORADNFS is a multi-call binary, a single binary that acts like several utilities. This allows ORADNFS to be smaller since all the built-in commands can leverage DNFS

code for many common operations. ORADNFS is run by issuing a command as an argument on the command line.

For example, `C:\> ORADNFS help` causes ORADNFS to print a list of built-in commands, and `C:\> ORADNFS ls C:\ORACLE\ORADATA\ORCL` causes ORADNFS to behave as an `ls` command of `C:\ORACLE\ORADATA\ORCL` remote directory, where `C:\ORACLE\ORADATA` is a DNFS virtual mount point specified in the `oranfstab` configuration file.

 **Note:**

- A valid copy of the `oranfstab` configuration file must be present in `ORACLE_HOME\db` directory for ORADNFS to operate.
- The user must be a member of the local `ORA_DBA` group to execute ORADNFS.

## Monitoring Direct NFS Client Usage

Use the following views for Direct NFS Client management:

- **v\$dnfs\_servers:** Shows a table of servers accessed using Direct NFS Client.
- **v\$dnfs\_files:** Shows a table of files currently open using Direct NFS Client.
- **v\$dnfs\_channels:** Shows a table of open network paths (or channels) to servers for which Direct NFS Client is providing files.
- **v\$dnfs\_stats:** Shows a table of performance statistics for Direct NFS Client.

## Enabling Direct NFS Client

To enable Direct NFS Client, you must add an `oranfstab` file to the `Oracle_home\db` directory and modify the related DLL files used by the Oracle Database software.

1. Create an `oranfstab` file.
2. Replace the standard ODM library, `oraodm12.dll`, with the ODM NFS library  
Oracle Database uses the ODM library, `oranfsodm12.dll`, to enable Direct NFS Client. To replace the ODM library, complete the following steps:
  - a. Change directory to `Oracle_home\bin`.
  - b. Shut down the Oracle Database instance on a node using the Server Control Utility (SRVCTL).
  - c. Enter the following commands:

```
copy oraodm12.dll oraodm12.dll.orig
copy /Y oranfsodm12.dll oraodm12.dll
```
  - d. Restart the Oracle Database instance using SRVCTL.
  - e. Repeat Step 2.a to Step 2.d for each node in the cluster.

## Disabling Direct NFS Client

Complete the following steps to disable the Direct NFS Client:

1. Log in as the Oracle Grid Infrastructure software owner.
2. Set `ORACLE_HOME` to Oracle home for which the Direct NFS Client must be disabled.
3. Change directory to `ORACLE_HOME\bin`.
4. Shut down the Oracle database.
5. Run the batch file, `disable_dnfs.bat` to delete `ORACLE_HOME\rdbms\lib\odm\oranfsodml2.dll`.
6. Remove the `oranfstab` file.

### Note:

If you remove an NFS path that an Oracle Database is using, then you must restart the database for the change to take effect.

## Enabling HCC on Direct NFS Client

To enable Hybrid Columnar Compression (HCC) on Direct NFS Client, perform the following steps:

1. Ensure that SNMP is enabled on the ZFS storage server. For example:

```
C:\>snmpget -v1 -c public server_name .1.3.6.1.4.1.42.2.225.1.4.2.0
SNMPv2-SMI::enterprises.42.2.225.1.4.2.0 = STRING: "Sun Storage 7410"
```
2. If SNMP is enabled on an interface other than the NFS server, then configure `oranfstab` using the `management` parameter.
3. If SNMP is configured using a community string other than `public`, then configure the `oranfstab` file using the `community` parameter.
4. Ensure that `Wsnmp32.dll` and `snmpapi.dll` are installed by checking if `snmpget` is available.

## Configuring Oracle Messaging Gateway

Oracle Messaging Gateway, an Oracle Database Advanced Queuing feature, requires additional configuration after you install Oracle Database if you plan to use Oracle Database Advanced Queuing.

### See Also:

*Oracle Database Advanced Queuing User's Guide*

## Configuring Oracle Administration Assistant for Windows

Oracle Administration Assistant for Windows requires the Microsoft Management Console and HTML Help 1.2 or later to run.

Microsoft Management Console (MMC) version 3.0 is available with Windows Server 2008 and Windows Server 2008 R2. Oracle recommends the latest MMC version available.



### See Also:

Microsoft documentation at

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

## Configuring Oracle Label Security

You must configure Oracle Label Security in a database to use it.



### See Also:

*Oracle Label Security Administrator's Guide*

## Configuring the OraClrAgnt Service for Oracle Database Extensions for .NET

Oracle Database Extensions for .NET depends on a Windows service to operate properly. This service is called the OraClrAgnt service, which can be accessed through the Service Control Panel, as `OraClrAgnt`, where `ORACLE_HOME` represents an Oracle home name.

In earlier versions of Oracle Database, the OraClrAgnt service was automatically created by the installer. Starting with Oracle Database 12c Release 2 (12.2), after installation you use the `OraClrCtl.exe` utility to create, start, stop, and delete the OraClrAgnt service. The OraClrAgnt service is configured by this tool using the Oracle Home User account specified during the Oracle Database installation.



### See Also:

*Oracle Database Extensions for .NET Developer's Guide for Microsoft Windows*

## Configuring Oracle Database Vault

Oracle Database includes Database Vault by default, but you must register it before you can use it.

You must create the Database Vault Owner user and, optionally, the Database Vault Account Manager administrative user accounts.



### See Also:

*Oracle Database Vault Administrator's Guide*

## Configuring Oracle Net Services

Describes how to configure Oracle Net Services.

If you have a previous release of Oracle software installed on this system, you can copy information from the Oracle Net `tnsnames.ora` and `listener.ora` configuration files from the previous release to the corresponding files for the new release.



### Note:

The default location for the `tnsnames.ora` and `listener.ora` files is the `ORACLE_BASE\ORACLE_HOME\network\admin\` directory.

### Modifying the `listener.ora` File

If you are upgrading from a previous release of Oracle Database, Oracle recommends that you use the current release of Oracle Net listener instead of the listener from the previous release.

If you have referenced the previous Oracle home directory names in the static listener information, then these directory names must be modified before the `listener.ora` file can be used in the 12.2 environment.

To use the listener from the current release, you must copy static service information from the `listener.ora` file from the previous release to the version of that file used by the new release.

For any database instances earlier than release 8.0.3, add static service information to the `listener.ora` file. Oracle Database releases later than release 8.0.3 do not require static service information.

### Modifying the `tnsnames.ora` File

Unless you are using a central `tnsnames.ora` file, copy Oracle Net service names and connect descriptors from the previous release `tnsnames.ora` file to the version of that file used by the new release.

If necessary, you can also add the 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 Examples media.



### See Also:

*Oracle Text Reference*

## Installing the Oracle Text Filtering Component

Oracle Text Filtering Technology requires the Visual C++ libraries included in the Visual C++ Redistributable Package provided by Microsoft.

You can download the 2005 SP1 Redistributable Package version at:

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

Run the `vc redistrib_x64.exe` file.



### See Also:

*Oracle Text Reference*

## Configuring or Reinstalling Oracle XML DB

Oracle XML DB is a component of the Oracle Database installation.

However, you must manually configure the FTP and HTTP ports for Oracle XML DB.



### See Also:

*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 12c database, then you must manually configure them.



## Configuring Shared Server Support

The default setup for using the Shared Server mode depends on how the software has been installed.

If you install Oracle Database using Oracle Universal Installer, then shared support is not configured. If you created your database through Oracle Database Configuration Assistant, then you were offered a choice of shared or dedicated server support.

## Setting Credentials for the Job System to Work with Oracle Enterprise Manager

Windows systems require that you set the correct credentials for the Jobs system to work properly in Oracle Enterprise Manager.

By default, the Management Agent service is installed as a `LocalSystem` user. When submitting jobs, such as stopping or starting the database, the operating system user submitting the job must have the **Log on as a batch job** privilege enabled.

Perform the following steps to establish that privilege for any operating system user who must submit an Oracle Enterprise Manager job.

1. Under the Security Settings list, expand the list to **Local Policies**.
2. Under Local Policies, double-click **User Rights Assignment**.
3. Under Policy, search for the **Log on as a batch job** policy.

If the Management Agent service is installed as any other user (that is, not `LocalSystem`), then, in addition to granting the **Log on as a batch job** privilege, you must grant the "Windows service" user the following three privileges:

- **Act as part of the operating system**
- **Adjust memory quotas for a process**
- **Replace a process level token**

The service under the "Windows service" user runs at the operating system level.

4. With each policy, perform the following steps:
  - a. Double-click the policy name.
  - b. In the Properties dialog box, click **Add User or Group**.
  - c. In the Select Users or Groups dialog box, enter the name of the user (for example, `jsmith`, `administrator`, and so on.)

 **Note:**

On Windows Server 2008, the name of the dialog box is Select Users, Computers, or Groups.

- d. Click **Check Names** to check that you have entered the name correctly.
- e. Click **OK**.

5. Click **OK** to exit the Properties dialog box, then exit Local Security Settings and Administrative Tools.
6. 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 Oracle Automatic Storage Management

On Windows, Oracle Database installations that use Oracle Automatic Storage Management must use Windows native authentication.

By default, Windows native authentication is enabled. To ensure that Windows native authentication is enabled, check the `sqlnet.ora` file, which by default is located in `ORACLE_HOME\network\admin`, and ensure that it has NTS enabled. For example:

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

### See Also:

*Oracle Database Platform Guide for Microsoft Windows*

## Installing Oracle Database Examples

If you plan to use the following products or features, then download and install the products from the Oracle Database Examples media:

- Oracle Database Examples
- Oracle JDBC Development Drivers
- Oracle Text Knowledge Base

### See Also:

*Oracle Database Examples Installation Guide*

## Creating the OraMTS Service for Microsoft Transaction Server

Oracle Services for Microsoft Transaction Server (OraMTS) permit Oracle databases to be used as resource managers in Microsoft application coordinated transactions.

OraMTS acts as a proxy for the Oracle database to the Microsoft Distributed Transaction Coordinator (MSDTC). As a result, OraMTS provides client-side connection pooling and allows client components that leverage Oracle to participate in promotable and distributed transactions. In addition, OraMTS can operate with Oracle

databases running on any operating system, given that the services themselves are run on Windows.

On releases before Oracle Database 12c, the OraMTS service was created as part of a software-only installation. Starting with Oracle Database 12c, you must use a configuration tool to create this service.

To create the OraMTS service after performing a software-only installation for Oracle Database, perform the following steps:

1. Open a command window.
2. Change directories to `ORACLE_HOME\bin`.
3. Run the `OraMTSctl` utility to create the OraMTS Service:

```
C:\ORACLE_HOME\bin> oramtsctl.exe -new
```

#### See Also:

*Oracle Services for Microsoft Transaction Server Developer's Guide for Microsoft Windows*

## Creating a Fast Recovery Area Disk Group

During installation, by default you can create multiple disk groups.

If you plan to add an Oracle Database for a standalone server, then you must create the fast recovery area for database files.

- [About the Fast Recovery Area and the Fast Recovery Area Disk Group](#)  
The fast recovery area is a unified storage location for all Oracle Database files related to recovery. Enabling rapid backups for recent data can reduce requests to system administrators to retrieve backup tapes for recovery operations.
- [Creating the Fast Recovery Area Disk Group](#)  
Use this procedure to create the fast recovery area disk group.

## About the Fast Recovery Area and the Fast Recovery Area Disk Group

The fast recovery area is a unified storage location for all Oracle Database files related to recovery. Enabling rapid backups for recent data can reduce requests to system administrators to retrieve backup tapes for recovery operations.

Database administrators can define the `DB_RECOVERY_FILE_DEST_SIZE` parameter to the path for the fast recovery area to enable on-disk backups, and rapid recovery of data.

When you enable fast recovery in the `init.ora` file, it writes all RMAN backups, archive logs, control file automatic backups, and database copies to the fast recovery area. RMAN automatically manages files in the fast recovery area by deleting obsolete backups and archive files no longer required for recovery.

Oracle recommends that you create a fast recovery area disk group. Oracle Clusterware files and Oracle Database files can be placed on the same disk group,

and you can also place fast recovery files in the same disk group. However, Oracle recommends that you create a separate fast recovery disk group to reduce storage device contention.

The fast recovery area is enabled by setting `DB_RECOVERY_FILE_DEST_SIZE`. The size of the fast recovery area is set with `DB_RECOVERY_FILE_DEST_SIZE`. As a general rule, the larger the fast recovery area, the more useful it becomes. For ease of use, Oracle recommends that you create a fast recovery area disk group on storage devices that can contain at least three days of recovery information. Ideally, the fast recovery area must be large enough to hold a copy of all of your data files and control files, the online redo logs, and the archived redo log files needed to recover your database using the data file backups kept under your retention policy.

Multiple databases can use the same fast recovery area. For example, assume you have created one fast recovery area disk group on disks with 150 GB of storage, shared by three different databases. You can set the size of the fast recovery for each database depending on the importance of each database. For example, if `database1` is your least important database, `database2` is of greater importance and `database3` is of greatest importance, then you can set different `DB_RECOVERY_FILE_DEST_SIZE` settings for each database to meet your retention target for each database: 30 GB for `database1`, 50 GB for `database2`, and 70 GB for `database3`.

## Creating the Fast Recovery Area Disk Group

Use this procedure to create the fast recovery area disk group.

1. Navigate to the Grid home bin directory, and start ASM Configuration Assistant (ASMCA). For example:

```
DRIVE_LETTER:\> cd \app\oracle\product\12.2.0\grid\bin
DRIVE_LETTER:\> asmca
```

2. ASMCA opens at the Disk Groups tab. Click **Create** to create a disk group.
3. The Create Disk Groups window opens.

In the Disk Group Name field, enter a descriptive name for the fast recovery area group. For example: `FRA`.

In the Redundancy section, select the level of redundancy you want to use.

In the Select Member Disks field, select the eligible disks to be added to the fast recovery area, and click **OK**.

4. The Diskgroup Creation window opens to inform you when the disk group creation is complete. Click **OK**.
5. Click **Exit**.

### See Also:

- *Oracle Database Backup and Recovery User's Guide*
- *Oracle Automatic Storage Management Administrator's Guide*

# Enabling and Disabling Database Options After Installation

When you install Oracle Database, some options are enabled and the others disabled. You can view the enabled Oracle Database options by querying the V\$OPTION view using SQL\*Plus.

## See Also:

*Oracle Database Administrator's Guide*

If you need to enable or disable a particular database feature for an Oracle home, then use the `chopt` tool. The `chopt` tool is a command-line utility that is located in the `ORACLE_HOME\bin` directory. The syntax for `chopt` is as follows:

```
chopt [ enable | disable] db_option
```

The possible values for `db_option` described in the following table.

**Table 7-1 Database Options for Chopt Tool Command**

Value	Description
oaa	Oracle Advanced Analytics
olap	Oracle OLAP
partitioning	Oracle Partitioning
rat	Oracle Real Application Testing
ode_net	Oracle Database Extensions for .NET

### Example 7-4 Running the Chopt Tool

To enable the Oracle Data Mining RDBMS Files option in your Oracle binary files:

1. Shut down the database with `srvctl` or SQL\*Plus:

```
srvctl stop database -d myDb
```

2. Stop the database service, `OracleServiceSID`, using the Services program in Control Panel.
3. Run the following commands:

```
cd ORACLE_HOME/bin  
chopt enable dm
```

4. Start the database service, `OracleServiceSID`, using the Services program in Control Panel.
5. Start up the database:

```
srvctl start database -d myDb
```

# Changing the Oracle Home User Password

Oracle Home User Control is a command-line utility that allows an administrator to update the password for an Oracle Home User.

This tool updates the password for Windows services in the Oracle home. The input password must match the password for the Windows User Account used as the Oracle Home User. So, first use the Windows operating system tools to change the Windows password and then use this tool to update the Windows services in the Oracle home to use the same password.



## Note:

You must have the Administrator privileges to run this Oracle Home User Control utility.

## Syntax Overview:

The following is the command syntax:

```
orahomeuserctl list | updpwd [-user username] [-host hostname1, hostname2, . . .] [-log logfile]
```

where:

- `orahomeuserctl` is used to display the Oracle Home User name associated with the current Oracle home or to update the Oracle Home User password.
- `list` displays the Oracle Home User name associated with the current Oracle home.
- `updpwd` prompts for the new password and updates the password for the named Oracle Service User. The following are the options for `updpwd`:

— `-user username`

This option determines the Oracle Home User name. If this option is not present, then the user name associated with the current Oracle home is used. If the named user, be it the `username` or user of the current Oracle home, is an MSA or Windows Built-in account, then an error message is displayed and the command is terminated.

— `-host hostname1, hostname2, . . .`

When this option is present, the utility updates the passwords for all the services belonging to the named Oracle Home User on the specified hosts. Otherwise, the Oracle Home User Control utility updates the passwords for all the services belonging to the named Oracle Home User on a specified host with single instance installation, or updates the passwords for all services belonging to the named Oracle Home User on all the specified hosts.

When the update completes, the utility displays the number of successful updates and any services that failed to update with the new password.

— `-log logfile`

This option adds the password update operation results to a log file for every service name receiving the new password. By default, the log files are located in the `ORACLE_HOME\log` directory. If `logfile` specifies only a file name, then the log is stored in the named file in the default directory. However, if the `logfile` contains a path, then that path is used without modification.

## Postinstallation Tasks for SQL Developer

Learn about the recommended postinstallation tasks for SQL Developer.

### See Also:

*Oracle SQL Developer Installation Guide*

- Migrating User Settings from a Previous Release
- Migrating Information from Previous Releases
- Location of User-Related Information

# 8

## Getting Started with Oracle Database

Learn how to check the installed contents, start various tools, identify, and locate various files after completing Oracle Database installation.

- [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.
- [Logging In to Oracle Enterprise Manager Database Express 12c](#)  
To start Oracle Enterprise Manager Database Express, use the EM Express URL provided by Oracle Database Configuration Assistant (Oracle DBCA) during the database installation and creation.
- [Managing Oracle Automatic Storage Management](#)  
Describes about starting and stopping Oracle Automatic Storage Management.
- [Starting and Stopping an Oracle Database](#)  
Describes about starting and stopping an Oracle database by using any of the following methods:
- [Accessing Oracle Database with SQL\\*Plus](#)  
You can use SQL\*Plus to issue SQL and PL/SQL statements to the Oracle Database.
- [Accessing Oracle Database with Oracle SQL Developer](#)  
You can use SQL Developer to issue SQL and PL/SQL statements. All SQL and PL/SQL commands are supported as they are passed directly from the SQL Worksheet to the Oracle Database.
- [Reviewing User Accounts and Passwords](#)  
All databases created by the Oracle Database Configuration Assistant include the `SYS`, `SYSTEM`, and `DBSNMP` database accounts.
- [Identifying Databases](#)  
The Oracle Database software identifies a database by its global database name.
- [Locating the Server Parameter File](#)  
The starter database contains one database initialization response file. The initialization response file, `init.ora.xxxxx`, must exist for an instance to start.
- [Identifying Tablespaces and Data Files](#)  
An Oracle Database is divided into smaller logical areas of space known as tablespaces.
- [Locating Redo Log Files](#)  
The preconfigured database uses three redo log files. Redo log files record all changes made to data in the database buffer cache.
- [Locating Control Files](#)  
The preconfigured database contains two control files located in the `ORACLE_BASE` `\oradata\DB_NAME` directory.



- [Understanding Oracle Database Services on Windows](#)  
The following Oracle services are automatically started after installation when you create a database:

## Checking the Installed Oracle Database Contents and Directory Location

Use Oracle Universal Installer to check the contents and directory location of your Oracle Database installation.

Follow these steps:

1. From the **Start** menu, select **All Programs**, then **Oracle - HOMENAME**, 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 Oracle Enterprise Manager Database Express 12c

To start Oracle Enterprise Manager Database Express, use the EM Express URL provided by Oracle Database Configuration Assistant (Oracle DBCA) during the database installation and creation.

If Oracle DBCA did not provide the EM Express URL during the database installation and creation, or if you need to change the EM Express port later on, then see the following:

### See Also:

- *Oracle Database 2 Day DBA* for information about “Starting EM Express”
- *Oracle Database 2 Day DBA* for information about “Accessing the Database Home Page”
- *Oracle Database 2 Day DBA* for information about “Configuring the HTTP Port for EM Express”

# Managing Oracle Automatic Storage Management

Describes about starting and stopping Oracle Automatic Storage Management.

- [Starting and Stopping Oracle Automatic Storage Management](#)  
To start and stop Oracle Automatic Storage Management, in addition to using SQL\*Plus, you can use the `srvctl` utility.
- [Oracle Automatic Storage Management Utilities](#)  
To manage Oracle Automatic Storage Management, you can use the following tools:

## Starting and Stopping Oracle Automatic Storage Management

To start and stop Oracle Automatic Storage Management, in addition to using SQL\*Plus, you can use the `srvctl` utility.

To start Oracle Automatic Storage Management instance using the `srvctl` utility, run the following command:

```
srvctl start asm
```

To stop Oracle Automatic Storage Management instance using the `srvctl` utility, run the following command:

```
srvctl stop asm
```

### See Also:

*Oracle Automatic Storage Management Administrator's Guide*

## Oracle Automatic Storage Management Utilities

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

- `asmcmd`: This command-line tool lets you manage Oracle Automatic Storage Management disk group files and directories.
- `asmtool`: This command-line tool is required to stamp the disks to create or modify disk groups later on after the database installation.
- Oracle Automatic Storage Management Configuration Assistant: Oracle Automatic Storage Management Configuration Assistant (ASMCA) is an interactive utility that enables you to create an Oracle Automatic Storage Management instance or upgrade existing Oracle Automatic Storage Management instances. It also enables you to create and configure disk groups, Oracle Automatic Storage Management volumes and Oracle Automatic Storage Management File Systems (ASMFS).

- Oracle Enterprise Manager Cloud Control: If you have Oracle Enterprise Manager installed, you can use Cloud Control to manage Oracle ASM functions, such as migrating an existing database to Oracle ASM, checking the status of the Oracle ASM instance, checking the performance of the Oracle ASM disk groups, and creating or dropping Oracle ASM disk groups.
- Oracle Enterprise Manager Database Express 12c: This utility enables you to perform basic administrative tasks such as user, performance, memory, and space management.
- SQL\*Plus: You can use Oracle Automatic Storage Management-specific commands from this tool. To connect to the Oracle Automatic Storage Management instance, you use the same methods that you use to connect to an Oracle Database instance.



#### See Also:

*Oracle Automatic Storage Management Administrator's Guide*

## Starting and Stopping an Oracle Database

Describes about starting and stopping an Oracle database by using any of the following methods:

- [Starting and Stopping the Database with Oracle Administration Assistant for Windows](#)  
Use this procedure to start or stop the database:
- [Starting and Stopping the Database from the Microsoft Windows Services Utility](#)  
You can use SQL or `srvctl` utility to start or stop the database instance. `SRVCTL` starts the service automatically.

## Starting and Stopping the Database with Oracle Administration Assistant for Windows

Use this procedure to start or stop the database:

To start or stop the database:

1. From the **Start** menu, select **All Programs**, then **Oracle - HOMENAME**, then **Configuration and Migration Tools**, and then **Administrative Assistant for Windows**.
2. In the console window, expand the Oracle Administration Assistant for Windows tree structure.
3. Under Databases, right-click the name of the database, and from the menu, select from the following options:
  - **Connect Database**
  - **Start Service**
  - **Disconnect Database**

- **Stop Service**
- **Startup/Shutdown Options**
- **Process Information**

## Starting and Stopping the Database from the Microsoft Windows Services Utility

You can use SQL or `srvctl` utility to start or stop the database instance. `SRVCTL` starts the service automatically.

To use SQL to start the database instance, start the Windows services:

1. From the **Start** menu, select **All Programs**, then **Administrative Tools**, and then **Services**.
2. In the Services dialog box, locate the name of the database you want to start or stop.
3. Right-click the name of the database, and from the menu, select either **Start**, **Stop**, or **Pause**.

To set its startup properties, right-click **Properties**, and in the dialog box, select either **Automatic**, **Manual**, or **Disabled** from the Startup type list.

## Accessing Oracle Database with SQL\*Plus

You can use SQL\*Plus to issue SQL and PL/SQL statements to the Oracle Database.

This tool enables you to perform the same database management operations, and query, insert, update, or delete data directly in the database.

To start SQL\*Plus, from the Start menu, select **All Programs**, then **Oracle - HOMENAME**, then **Application Development**, and then **SQL Plus**.

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

```
C:\> sqlplus /nolog
SQL> CONNECT user_name
Enter password: password
```

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

```
C:\> sqlplus /nolog
SQL> CONNECT SYSTEM
Enter password: password
```

If you are logging on as `sys`, you must connect as `sysdba`:

```
C:\> sqlplus /nolog
SQL> CONNECT SYS AS SYSDBA
Enter password: password
```

 **See Also:**

- *SQL\*Plus User's Guide and Reference*
- *SQL\*Plus Quick Reference*
- *Oracle Database Administrator's Guide*

## Accessing Oracle Database with Oracle SQL Developer

You can use SQL Developer to issue SQL and PL/SQL statements. All SQL and PL/SQL commands are supported as they are passed directly from the SQL Worksheet to the Oracle Database.

All SQL and PL/SQL commands are supported as they are passed directly from the SQL Worksheet to the Oracle Database.

To start SQL Developer:

1. From the **Start** menu, select **All Programs**, then **Oracle - HOMENAME**, then **Application Development**, and then **SQL Developer**.
2. If you are prompted to enter the full path name for java.exe, click **Browse** and find java.exe. For example, C:\Program Files\Java\jdk1.6.0\_25\bin\java.exe.
3. Once SQL Developer starts, perform the following steps:
  - Right-click **Connections**.
  - Select **New Connection**.
  - In the New/Select Database Connection dialog box, enter a Connection name, username, password, and for the host string, the name of the database to which you want to connect.
  - Click **Connect**.

Once connected, you can view, create, modify, and delete the database objects using the Connection Navigator or issue any SQL or PL/SQL command using a SQL Worksheet (From the **Tools** menu, select **SQL Worksheet**).

SQL\*Plus commands have to be interpreted by the SQL Worksheet before being passed to the database. The SQL Worksheet currently supports many SQL\*Plus commands. SQL\*Plus commands which are not supported by the SQL Worksheet are ignored and are not sent to the Oracle Database.

 **See Also:**

*Oracle SQL Developer User's Guide*

## Reviewing User Accounts and Passwords

All databases created by the Oracle Database Configuration Assistant include the `SYS`, `SYSTEM`, 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.

### Note:

Use Oracle Enterprise Manager Database Express 12c to view the complete list of database accounts.

- [Reviewing Administrative Accounts](#)  
Describes the administrative user names.
- [Unlocking and Resetting User Passwords](#)  
Passwords for all Oracle system administration accounts except `SYS`, `SYSTEM`, and `DBSNMP` are revoked after installation.

### Related Topics

- [Unlocking and Resetting User Passwords](#)  
Passwords for all Oracle system administration accounts except `SYS`, `SYSTEM`, and `DBSNMP` are revoked after installation.

### See Also:

*Oracle Database Administrator's Guide*

## Reviewing Administrative Accounts

Describes the administrative user names.

**Table 8-1 Administrative Accounts**

User Name	Description	See Also
ANONYMOUS	Allows HTTP access to Oracle XML DB.	<i>Oracle XML DB Developer's Guide</i>
APEX_050000	The account owns the Oracle Application Express schema and metadata.	<i>Oracle Application Express App Builder User's Guide</i>
APEX_PUBLIC_USER	The minimally privileged account used for Oracle Application Express configuration with Oracle HTTP Server and <code>mod_plsql</code> .	<i>Oracle Application Express Application Builder User's Guide</i>
APPQOSSYS	Used for storing or managing all data and metadata required by Oracle Quality of Service Management.	None

Table 8-1 (Cont.) Administrative Accounts

User Name	Description	See Also
AUDSYS	The account where the unified audit data trail resides.	<i>Oracle Database Security Guide</i>
CTXSYS	The Oracle Text account.	<i>Oracle Text Reference</i>
DBSNMP	Used by Management Agent of Oracle Enterprise Manager to monitor and manage the database.	<i>Oracle Enterprise Manager Cloud Control Administrator's Guide</i>
DIP	Used by Directory Integration Platform (DIP) to synchronize the changes in Oracle Internet Directory with the applications in the database.	None
DVF	The account owned by Database Vault that contains public functions to retrieve the Database Vault Factor values.	<i>Oracle Database Vault Administrator's Guide</i>
DVSYS	There are two roles associated with this account. Database Vault owner role manages the Database Vault roles and configurations. The Database Vault Account Manager is used to manage database user accounts.  <b>Note:</b> Part of Oracle Database Vault user interface text is stored in database tables in the DVSYS schema. By default, only the English language is loaded into these tables. You can use the <code>DVSYS.DBMS_MACADM.ADD-NLS_DATA</code> procedure to add other languages to Oracle Database Vault. See the "Adding Languages to Oracle Database Vault" section in the <i>Oracle Database Vault Administrator's Guide</i>	<i>Oracle Database Vault Administrator's Guide</i>
EXFSYS	Owns the Expression Filter schema.	None
FLows_FILES	The account owns the Oracle Application Express uploaded files.	<i>Oracle Application Express App Builder User's Guide</i>
GSMADMIN_INTERNAL	The internal account that owns the Global Data Services schema. It must not be unlocked or used for a database login.	<i>Oracle Database Global Data Services Concepts and Administration Guide</i>
GSMCATUSER	The account used by Global Service Manager to connect to the Global Data Services catalog.	<i>Oracle Database Global Data Services Concepts and Administration Guide</i>
GSMUSER	The account used by Global Service Manager to connect to the database.	<i>Oracle Database Global Data Services Concepts and Administration Guide</i>
HR	Owns 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>
LBACSYS	The Oracle Label Security administrator account.	<i>Oracle Label Security Administrator's Guide</i>
MDDATA	The schema used by Oracle Spatial and Graph for storing geocoder and router data.	<i>Oracle Spatial and Graph Developer's Guide</i>
MDSYS	The Oracle Spatial and Graph, and Oracle Multimedia Locator administrator account.	<i>Oracle Spatial and Graph Developer's Guide</i>
ORACLE_OCM	This account contains the instrumentation for configuration collection used by the Oracle Configuration Manager.	<i>Oracle Configuration Manager Installation and Administration Guide</i>

**Table 8-1 (Cont.) Administrative Accounts**

<b>User Name</b>	<b>Description</b>	<b>See Also</b>
ORDDATA	This account contains the Oracle Multimedia DICOM data model.	<i>Oracle Multimedia DICOM Developer's Guide</i>
ORDPLUGINS	The Oracle Multimedia user. Plug-ins supplied by Oracle and third party plug-ins are installed in this schema.	<i>Oracle Multimedia User's Guide</i>
ORDSYS	The Oracle Multimedia administrator account.	<i>Oracle Multimedia User's Guide</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.	None
REMOTE_SCHEDULER_AGENT	The account to disable remote jobs on a database.	<i>Oracle Database Administrator's Guide</i>
SI_INFORMTN_SCHEMA	Stores the information views for the SQL/MM Still Image Standard.	<i>Oracle Multimedia User's Guide</i>
SPATIAL_CSW_ADMIN_USR	The Catalog Services for the Web (CSW) account. It is used by the Oracle Spatial and Graph CSW cache manager to load all record type metadata, and record instances from the database into the main memory for the record types that are cached.	<i>Oracle Spatial and Graph Developer's Guide</i>
SPATIAL_WFS_ADMIN_USR	The Web Feature Service (WFS) account. It is used by the Oracle Spatial and Graph WFS cache manager to load all feature-type metadata, and feature instances from the database into main memory for the feature types that are cached.	<i>Oracle Spatial and Graph Developer's Guide</i>
SYS	Used for performing database administration tasks.	<i>Oracle Database Administrator's Guide</i>
SYSBACKUP	The account used to perform backup and recovery tasks.	<i>Oracle Database Installation Guide</i> (this guide)
SYSDG	The account used to administer and monitor Oracle Data Guard.	<i>Oracle Database Installation Guide</i> (this guide)
SYSKM	The account used to perform encryption key management.	<i>Oracle Database Installation Guide</i> (this guide)
SYSRAC	The account used to perform a limited set of administrative tasks to create a separate group of operating system users.	<i>Oracle Database Installation Guide</i> (this guide)
SYS\$UMF	The account used to administer Remote Management Framework, including the remote Automatic Workload Repository (AWR).	<i>Oracle Database Performance Tuning Guide</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 Workspace Manager Developer's Guide</i>
XDB	Used for storing Oracle XML DB data and metadata.	<i>Oracle XML DB Developer's Guide</i>



 **See Also:**

- *Oracle Database Administrator's Guide*
- *Oracle Database Platform Guide for Microsoft Windows*

## Unlocking and Resetting User Passwords

Passwords for all Oracle system administration accounts except `SYS`, `SYSTEM`, and `DBSNMP` are revoked after installation.

Before you use a locked account, you must unlock it and reset its password. If you created a preconfigured database during the installation, but you did not unlock accounts required to use the database, then you must unlock and reset those accounts using these procedures.

Apply the following guidelines when specifying passwords:

- Passwords must be between 8 and 30 characters long.
- Passwords must not start with a numeral.
- Password cannot contain invalid characters: `! @ % ^ & * ( ) + = \ | ` ~ [ { ] } ; : ' " , < > ?`
- Passwords must not be the same as the user name.
- Passwords must not be Oracle reserved words.
- The `SYS` account password cannot be `change_on_install`. (case-insensitive)
- The `SYSTEM` account password cannot be `manager`. (case-insensitive)
- The `SYSMAN` account password cannot be `sysman`. (case-insensitive)
- The `DBSNMP` account password cannot be `dbsnmp`. (case-insensitive)
- If you choose to use the same password for all the accounts, then that password cannot be `change_on_install`, `manager`, `sysman`, or `dbsnmp`. (case-insensitive)
- Passwords must have at least one alphabetic, one numeric, and one special character.
- Passwords must not be simple or obvious words, such as `welcome`, `account`, `database`, and `user`.

 **Note:**

If you select the option to create the database as a multitenant container database, then you must provide the pluggable database administrator password.

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 Enterprise Manager Database Express 12c to Unlock Accounts and Reset Passwords](#)
- [Using SQL\\*Plus to Unlock and Change Passwords](#)
- [Using Enterprise Manager Database Express 12c to Unlock Accounts and Reset Passwords](#)  
Use this procedure to unlock and reset user account passwords using Oracle Enterprise Manager Database Express 12c.
- [Using SQL\\*Plus to Unlock and Change Passwords](#)  
Use this SQL\*Plus procedure to unlock and reset user account passwords.



**See Also:**

*Oracle Database Administrator's Guide*

## Using Enterprise Manager Database Express 12c to Unlock Accounts and Reset Passwords

Use this procedure to unlock and reset user account passwords using Oracle Enterprise Manager Database Express 12c.

To unlock and reset user account passwords:



**See Also:**

*Oracle Database 2 Day DBA*



**Tip:**

Click **Help** in the Oracle Enterprise Manager Database Express 12c window for more information

## Using SQL\*Plus to Unlock and Change Passwords

Use this SQL\*Plus procedure to unlock and reset user account passwords.

To change a password after installation:

1. Start SQL\*Plus:

```
C:\> sqlplus /nolog
```

2. Connect as SYSDBA:

```
SQL> CONNECT SYS AS SYSDBA  
Enter password: SYS_password
```

3. Enter a command similar to the following, where *account* is the user account to unlock and *password* is the new password:

```
SQL> ALTER USER account IDENTIFIED BY password ACCOUNT UNLOCK;
```

#### See Also:

- *Oracle Database Security Guide*
- *Oracle Database SQL Language Reference*
- *Oracle Database Administrator's Guide*

## Identifying Databases

The Oracle Database software identifies a database by its global database name.

A global database name consists of the database name and database domain. Usually, the database domain is the same as the network domain, but it need not be. The global database name uniquely distinguishes a database from any other database in the same network. You specify the global database name when you create a database during the installation, or when using Oracle Database Configuration Assistant.

The database name input field is used to set the `DB_NAME`, `DB_UNIQUE_NAME`, and `DB_DOMAIN` Oracle initialization parameter values.

For example:

```
sales_world.example.com
```

In this example:

- `sales_world` is the name of the database. The database name (`DB_UNIQUE_NAME`) portion is a string of no more than 30 characters that can contain ASCII alphanumeric, underscore (`_`), dollar (`$`), and pound (`#`) characters but must begin with an alphabetic character. No other special characters are permitted in a database name.
- `sales_wo` is the `DB_NAME`. The `DB_NAME` initialization parameter specifies a database identifier of up to eight characters.
- `example.com` is the network domain in which the database is located. Together, the database name and the network domain make the global database name unique. The domain portion is a string of no more than 128 characters that can contain alphanumeric, underscore (`_`), and pound (`#`) characters. The `DB_DOMAIN` initialization parameter specifies the domain name.

However, the `DB_NAME` parameter need not necessarily be the first eight characters of `DB_UNIQUE_NAME`.

The `DB_UNIQUE_NAME` parameter and the `DB_DOMAIN` name parameter combine to create the global database name value assigned to the `SERVICE_NAMES` parameter in the initialization parameter file.

The System Identifier (SID) identifies a specific database instance. The SID uniquely distinguishes the instance from any other instance on the same computer. Each database instance requires a unique SID and database name.

For example, if the SID and database name for an Oracle database are `ORCL`, then each database file is located in the `ORACLE_BASE\oradata\orcl` directory, and the initialization response file is located in the `ORACLE_BASE\admin\orcl\pfile` directory.

 **See Also:**

*Oracle Database Reference*

## Locating the Server Parameter File

The starter database contains one database initialization response file. The initialization response file, `init.ora.xxxxx`, must exist for an instance to start.

A response file is a text file that contains a list of instance configuration parameters. The starter database `init.ora` file has preconfigured parameters. You must not edit this file to use the starter database.

The server parameter file (SPFILE) is created from the initialization response file, then the initialization response file is renamed. The SPFILE file name is `spfileSID.ora` and is located in the `ORACLE_HOME\database` directory.

To use Oracle Enterprise Manager Database Express 12c to view the location of the server parameter file and list the initialization parameters, see the "Viewing and Modifying Initialization Parameters" section in *Oracle Database 2 Day DBA*.

 **See Also:**

Click **Help** in the Oracle Enterprise Manager Database Express 12c window for more information

 **See Also:**

*Oracle Database 2 Day DBA*

## 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 12c databases.

The following table lists 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 8-2 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 run 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 must expand this tablespace.
UNDOTBS	UNDOTBS01.DBF	Stores undo information. This 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.

**See Also:**

- *Oracle Database Concepts*
- *Oracle Database Administrator's Guide*
- *Oracle Database 2 Day DBA*

## Locating Redo Log Files

The preconfigured database uses three redo log files. Redo log files record 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.

Oracle Database uses redo log files in a cyclical fashion. For example, if three files constitute the online redo log, Oracle Database fills the first file, then the second file, and then the third file. In the next cycle, it reuses and fills the first file, the second file, and so on.

 **See Also:**

- *Oracle Database 2 Day DBA* about Viewing Online Redo Log File Information
- *Oracle Database 2 Day DBA* about Viewing Archived Redo Log File Information
- *Oracle Database 2 Day DBA*
- *Oracle Database Backup and Recovery User's Guide*

## Locating Control Files

The preconfigured database contains two control files located in the `ORACLE_BASE \oradata\DB_NAME` directory.

The preconfigured database contains two control files located in the `ORACLE_BASE \oradata\DB_NAME` directory. Oracle recommends that you keep at least two control files (on separate physical drives) for each database, and set the `CONTROL_FILES` initialization parameter to list each control file.

A control file is an administrative file. Oracle Database 12c requires a control file to start and run the database. The control file defines the physical structure of the database. For example, it defines the database name and the names and locations of the database data files and redo log files.

 **See Also:**

*Oracle Database Administrator's Guide*

For more information about using Oracle Enterprise Manager Database Express 12c to perform various tasks related to tablespaces and data files, redo log files, and control files, click **Help** in the Oracle Enterprise Manager Database Express window.

 **See Also:**

- *Oracle Database Administrator's Guide*
- *Oracle Database 2 Day DBA* for information about “Viewing Control File”

## Understanding Oracle Database Services on Windows

The following Oracle services are automatically started after installation when you create a database:

- `OracleServiceSID` (Oracle Database service)
- `OracleHOMENAME_TNSListener` (Oracle Database listener service)

If you configured Oracle Automatic Storage Management, then the `OracleOHService` and `OracleASMServices+ASM` services are listed as well. However, other services for networking or other individual components may not automatically start.

# 9

## Removing Oracle Database Software

Learn how to remove Oracle software and configuration files.

You can remove Oracle software either by using Oracle Universal Installer with the `deinstall` option, or by using the deinstallation tool (`deinstall`) that is included in Oracle homes. Oracle does not support the removal of individual products or components related to the specified Oracle home. It includes information about removing Oracle software using the deinstallation tool.

The deinstallation tool removes standalone Oracle Database installations, Oracle Clusterware and Oracle Automatic Storage Management (Oracle ASM) from your server, as well as Oracle Real Application Clusters (Oracle RAC), and Oracle Database client installations.

Oracle recommends that you use the deinstallation tool to remove the entire Oracle home associated with the Oracle Database, Oracle Clusterware, Oracle ASM, Oracle RAC, or Oracle Database client installation. Oracle does not support the removal of individual products or components.

### ▲ Caution:

If you have a standalone database on a node in a cluster and you have multiple databases with the same global database name (GDN), then you cannot use the deinstallation tool to remove one database only.

### ▲ Caution:

You must use the deinstallation tool from the same release to remove Oracle software. Do not run the deinstallation tool from a later release to remove Oracle software from an earlier release. For example, do not run the deinstallation tool from the 12.2.0.1 installation media to remove Oracle software from an existing 11.2.0.4 Oracle home.

- [About Oracle Deinstallation Options](#)

Using Oracle Universal Installer with the `deinstall` option, or running the deinstallation tool from the Oracle home, stops and removes Oracle software and its components, such as database and configuration files for a specific Oracle home.

- [Example of Running the Deinstallation Tool](#)

If you perform a deinstallation by running the `setup.exe` command with the `-deinstall` option from the installation media, then the help displays.



- [Deinstallation Examples for Oracle Database](#)  
Examples of running deinstallation using OUI (`runInstaller`) or as a standalone tool (`deinstall`).
- [Deinstallation Response File Example for Oracle Database](#)  
You can run the deinstallation tool with the `-paramfile` option to use the values you specify in the response file.
- [Deinstallation Response File Example for Oracle Grid Infrastructure](#)  
You can run the deinstallation tool with the `-paramfile` option to use the values you specify in the response file.
- [Downgrading Oracle Restart](#)  
Use this procedure to deconfigure and downgrade Oracle Restart, or to troubleshoot Oracle Restart if you receive an error during installation.

 **See Also:**

- *Oracle Grid Infrastructure Installation and Upgrade Guide for Microsoft Windows x64 (64-Bit)*
- *Oracle Real Application Clusters Installation Guide for Microsoft Windows x64 (64-Bit)*
- *Oracle Automatic Storage Management Administrator's Guide*

## About Oracle Deinstallation Options

Using Oracle Universal Installer with the `deinstall` option, or running the deinstallation tool from the Oracle home, stops and removes Oracle software and its components, such as database and configuration files for a specific Oracle home.

You can remove the following software using Oracle Universal Installer or the Oracle deinstallation tool:

- Oracle Database
- Oracle Grid Infrastructure, which includes Oracle Clusterware and Oracle Automatic Storage Management (Oracle ASM)
- Oracle Real Application Clusters (Oracle RAC)
- Oracle Database Client

Starting with Oracle Database 12c, the deinstallation tool is integrated with the database installation media. You can run the deinstallation tool using the `runInstaller` command with the `-deinstall` and `-home` options from the base directory of the Oracle Database, Oracle Database Client, or Oracle Grid Infrastructure installation media.

The deinstallation tool is also available as a separate command (`deinstall`) in Oracle home directories after installation, and is located in the following directory:

```
ORACLE_HOME\deinstall
```

The deinstallation tool uses the information you provide, plus information gathered from the software home to create a response file. You can alternatively supply a

response file generated previously by the `deinstall` command using the `-checkonly` option, or by editing the response file template.

Using Oracle Universal Installer with the `deinstall` option, or running the deinstallation tool from the Oracle home, stops and removes Oracle software and its components, such as database and configuration files for a specific Oracle home.

If the software in the Oracle home is not running (for example, after an unsuccessful installation), then the deinstallation tool cannot determine the configuration, and you must provide all the configuration details either interactively or in a response file.

In addition, before you run the deinstallation tool for Oracle Grid Infrastructure installations, ensure that you meet the following guidelines:

- Dismount Oracle Automatic Storage Management Cluster File System (Oracle ACFS) and disable Oracle Automatic Storage Management Dynamic Volume Manager (Oracle ADVM).
- If Grid Naming Service (GNS) is in use, then notify your DNS administrator to delete the subdomain entry from the DNS.

### **Caution:**

When you install Oracle Database, if the central inventory contains no other registered homes besides the home that you are deconfiguring and removing, then the Deinstallation tool removes the following files and directory contents in the Oracle base directory of the Oracle Database installation owner:

- `admin`
- `cfgtoollogs`
- `checkpoints`
- `diag`
- `oradata`
- `flash_recovery_area`

Oracle strongly recommends that you configure your installations using an Optimal Flexible Architecture (OFA) configuration, and that you reserve Oracle base and Oracle home paths for exclusive use of Oracle software. If you have any user data in these locations in the Oracle base that is owned by the user account that owns the Oracle software, then the deinstallation tool deletes this data.

The deinstallation tool deletes Oracle Database configuration files, user data, and fast recovery area (FRA) files even if they are located outside of the Oracle base directory path.

Oracle recommends that you run the deinstallation tool as the Oracle software installation owner. The default method for running the deinstallation tool is from the `deinstall` directory in the Oracle home as the installation owner:

```
ORACLE_HOME\deinstall  
DRIVE_LETTER:\> deinstall\deinstall.bat
```

The command uses the following syntax, where variable content is indicated by italics:

```
deinstall.bat [-silent] [-checkonly]
[-paramfile complete path of input parameter property file] [-params name1=value
name2=value . . .]
[-o complete path of directory for saving files] [-help]
[-tmpdir complete path of temporary directory to use]
[-logdir complete path of log directory to use] [-help]
```

To run the deinstallation tool from the database installation media, use the `setup.exe` command with the `-deinstall` option, followed by the `-home` option to specify the path of the Oracle home you want to remove using the following syntax, where variable content is indicated in italics:

```
setup.exe -deinstall -home complete path of Oracle home [-silent] [-checkonly] [-
local]
[-paramfile complete path of input parameter property file] [-params name1=value
name2=value . . .] [-o complete path of directory for saving files] [-help]
[-tmpdir complete path of temporary directory to use]
[-logdir complete path of log directory to use] [-help]
```

Provide information about your servers as prompted or accept the defaults.

#### Note:

If User Account Control is enabled, then you must create a desktop shortcut to a DOS command window. Open the command window through the **Run as administrator**, right-click context menu, and start the deinstallation tool.

In addition, you can run the deinstallation tool from other locations, or with a response file, or select other options to run the tool.

- `-home`

Use this flag to indicate the home path of the Oracle home to check or deinstall. To deinstall Oracle software using the `deinstall` command, located in the Oracle home you plan to deinstall, provide a response file in a location outside the Oracle home, and do not use the `-home` flag.

If you run the deinstallation tool from the `ORACLE_HOME\deinstall` path, then the `-home` flag is not required because the tool identifies the location of the home where it is run. If you run the tool using `setup.exe -deinstall` from the installation media, then `-home` is mandatory.

- `-silent`

Use this flag to run the deinstallation tool in a noninteractive mode. This option requires one of the following:

- A working system that it can access to determine the installation and configuration information. The `-silent` flag does not work with failed installations.
- A response file that contains the configuration values for the Oracle home that is being deinstalled or deconfigured.

You can generate a response file to use or modify by running the tool with the `-checkonly` flag. The tool then discovers information from the Oracle home to deinstall and deconfigure. It generates the response file that you can then use with the `-silent` option.

You can also modify the template file `deinstall.rsp.tmpl`, located in the `ORACLE_HOME\deinstall\response` directory.

- `-checkonly`

Use this flag to check the status of the Oracle software home configuration. Running the deinstallation tool with the `-checkonly` flag does not remove the Oracle configuration. The `-checkonly` flag generates a response file that you can then use with the deinstallation tool and `-silent` option.

- `-paramfile` *complete path of input parameter property file*

Use this flag to run the deinstallation tool with a response file in a location other than the default. When you use this flag, provide the complete path where the response file is located.

The default location of the response file depends on the location of the deinstallation tool:

- From the installation media or stage location: `\response`
- After installation from the installed Oracle home: `\deinstall\response`.

- `-params` ["name1=value" "name2=value" "name3=value" . . .]

Use this flag with a response file to override one or more values to change it in a response file you have created.

- `-o` *complete path of directory for saving response file*

Use this flag to provide a path other than the default location where the response file is saved. The default location is `\response\deinstall.rsp.tmpl`.

The default location of the response file depends on the location of deinstallation tool:

- From the installation media or stage location before installation: `\response`
- After installation from the installed Oracle home: `ORACLE_HOME/deinstall/response`.

- `-tmpdir` *complete path of temporary directory*

Specifies a non-default location where Oracle Deinstallation Tool writes the temporary files for the deinstallation.

- `-logdir` *complete path of log directory*

Specifies a non-default location where Oracle Deinstallation Tool writes the log files for the deinstallation.

- `-help`

Use the help option (`-help`) to obtain additional information about the command optional flags.

## Related Topics

- [Managing User Accounts with User Account Control](#)

To ensure that only trusted applications run on your computer, the Windows operating systems that support Oracle Database, provide User Account Control.

 **See Also:**

*Oracle Real Application Clusters Installation Guide for Microsoft Windows x64 (64-Bit)* for information about the `-local` option

## Example of Running the Deinstallation Tool

If you perform a deinstallation by running the `setup.exe` command with the `-deinstall` option from the installation media, then the help displays.

Enter the `-home` flag and provide the path to the home directory of the Oracle software to remove from your system.

Use the optional flag `-paramfile` to provide a path to a response file.

In the following example, the `setup.exe` command is in the path `\directory_path`, where `directory_path` is the path to the database directory on the installation media, and `C:\app\oracle\product\12.2.0\dbhome_1` is the path to the Oracle home which is removed:

```
DRIVE_LETTER:\> cd \directory_path
DRIVE_LETTER:\> setup.exe -deinstall -home C:\app\oracle\product\12.2.0\dbhome_1
```

The following example uses a response file in the software owner location `C:\Documents and Settings\oracle\`:

```
DRIVE_LETTER:\> cd \directory_path
DRIVE_LETTER:\> setup.exe -deinstall -paramfile C:\Documents and Settings\oracle
\my_db_paramfile.tmp1
```

## Deinstallation Examples for Oracle Database

Examples of running deinstallation using OUI (`runinstaller`) or as a standalone tool (`deinstall`).

If you run the deinstallation tool using `runinstaller -deinstall` from the installation media, then the help displays unless you enter a `-home` flag and provide a path to the home directory of the Oracle software to remove from your system.

Use the optional flag `-paramfile` to provide a path to a response file.

You can generate a deinstallation response file by running the deinstallation tool with the `-checkonly` flag. Alternatively, you can use the response file template located at `DRIVE_LETTER:\ORACLE_HOME\deinstall\response\deinstall.rsp.tmp1`.

In the following example, the `deinstall` command is in the path `C:\app\oracle\product\12.2.0\dbhome_1\deinstall`, and it uses a response file in the software owner location `C:\Documents and Settings\oracle\`:

```
DRIVE_LETTER:\> cd \app\oracle\product\12.2.0\dbhome_1\deinstall\
DRIVE_LETTER:\> deinstall.bat -paramfile %HOMEPATH%\my_db_paramfile.tmp1
```

For the grid infrastructure home, use the deinstallation script (`deinstall.bat`) in the Oracle Restart home, which in this example is `C:\app\oracle\product\12.2.0\grid`:

```
DRIVE_LETTER:\> cd \app\oracle\product\12.2.0\grid\deinstall\
DRIVE_LETTER:\> deinstall.bat -paramfile %HOMEPATH%\my_grid_paramfile.tmp1
```

## Deinstallation Response File Example for Oracle Database

You can run the deinstallation tool with the `-paramfile` option to use the values you specify in the response file.

The following is an example of a response file, in which the Oracle Database binary owner is `oracle`, the Oracle Database home (Oracle home) is in the path `C:\app\oracle\product\12.2.0\dbhome_1`, the Oracle base (where other Oracle software is installed) is `C:\app\oracle`, the Oracle Inventory home is `C:\Program Files\Oracle\Inventory`, and the local node (the node where you run the deinstallation session from) is `myserver`:

```
#Copyright (c) 1998, 2015 Oracle Corporation. All rights reserved.
ORACLE_HOME=C:\app\oracle\product\12.2.0\dbhome_1
ORACLE_BASE.orcl=C:\app\oracle
FLASH_RECOVERY_LOC.orcl=C:\app\oracle\flash_recovery_area\ORCL
STORAGE_TYPE.orcl=FS
DB_TYPE.orcl=SI_DB
NETCA_LOCAL_LISTENERS=LISTENER
LOGDIR=C:\app\oracle\product\12.2.0\dbhome_1\deinstall\logs\
NODE_LIST.orcl=myserver
ObaseCleanupPtrLoc=\tmp\deinstall\2012-06-12_09-14-11AM\orabase_cleanup.lst
ARCHIVE_LOG_DESTINATION_LOC.orcl=
ORACLE_BASE=C:\app\oracle
DUMP_DESTINATION_LOC.orcl=C:\app\oracle\admin\orcl
LOCAL_SID.orcl=orcl
INVENTORY_LOCATION=C:\Program Files\Oracle\Inventory
RAW_MAPPING_FILE.orcl=
SID_LIST.orcl=orcl
DB_UNIQUE_NAME_LIST=orcl
DATAFILE_LOC.orcl=C:\app\oracle\oradata\orcl, C:\app\oracle\fast_recovery_area\orcl
HOME_TYPE=SIDB
CRS_HOME=false
CREATION_MODE.orcl=y
CONFIGFILE_LOC.orcl=
ORACLE_BINARY_OK=true
DIAG_DEST.orcl=C:\app\oracle\diag\rdbms\orcl
LOCAL_NODE=myserver
local=false
SPFILE_LOC.orcl=C:\app\oracle\product\12.2.0\dbhome_1\dbs\spfileorcl.ora
inventory_loc=C:\Program Files\Oracle\Inventory
MinimumSupportedVersion=11.2.0.1.0
silent=false
DBCA_LOG.orcl=C:\app\oracle\cfgtoollogs\dbc\orcl
ORACLE_HOME=C:\app\oracle\product\12.2.0\dbhome_1
CCR_CONFIG_STATUS=CCR_DEL_HOME
EMCA_LOG.orcl=C:\app\oracle\cfgtoollogs\emca\orcl
ORACLE_HOME_VERSION_VALID=true
```

## Deinstallation Response File Example for Oracle Grid Infrastructure

You can run the deinstallation tool with the `-paramfile` option to use the values you specify in the response file.

The following is an example of a response file, in which the Oracle grid infrastructure binary owner is `oracle`, the Oracle grid infrastructure home is in the path `D:\app\oracle`, the Oracle base (where other Oracle software is installed) is `D:\app\12.2.0\`, the central Oracle inventory home (`oraInventory`) is , the local node (the node where `C:\Program Files\Oracle\Inventory` you are run the deinstallation session from) is `myserver`:

```
# Copyright (c) 1998, 2015 Oracle Corporation. All rights reserved.
ORACLE_HOME=C:\app\oracle\product\12.2.0\grid
LOCAL_NODE=myserver
HOME_TYPE=SIHA
ASM_REDUNDANCY=EXTERNAL
ORACLE_BASE=C:\app\oracle\
ObaseCleanupPtrLoc=C:\Users\oracle\AppData\Local\Temp\deinstall2013-01-28_05-03-31AM
\utl\orabase_cleanup.lst
SCAN_PORT=0
silent=false
ASM_UPGRADE=false
ORA_CRS_HOME=C:\app\oracle\product\12.2.0\grid
MinimumSupportedVersion=11.2.0.1.0
GPNPCONFIGDIR=$ORACLE_HOME
LOGDIR=C:\Users\username\logs\
ORACLE_HOME_VERSION_VALID=true
GPNPGCONFIGDIR=$ORACLE_HOME
ORACLE_OWNER=username
ISROLLING=true
CRS_STORAGE_OPTION=0
ORACLE_BINARY_OK=true
MGMT_DB=false
NETCA_LISTENERS_REGISTERED_WITH_HAS=LISTENER
ASM_AU_SIZE=1
HUB_SIZE=0
ASM_ORACLE_BASE=C:\app\oracle
ORA_DBA_GROUP=
JREDIR=C:\app\oracle\product\12.2.0\grid\jdk\jre\
USER_IGNORED_PREREQ=false
ASM_DISK_GROUPS="+DATA"
ORA_ASM_GROUP=
LANGUAGE_ID=AMERICAN_AMERICA.WE8MSWIN1252
CSS_LEASEDURATION=400
ASM_HOME=C:\app\oracle\product\12.2.0\grid
ASM_DIAGNOSTIC_DEST=C:\app\oracle\product\OB
TZ=America/Denver
WindowsRegistryCleanupList=C:\Users\oracle\AppData\Local\Temp
\deinstall2013-01-28_05-03-31AM\utl\registry_cleanup.lst
REUSEDG=false
SILENT=false
local=false
INVENTORY_LOCATION=C:\Program Files\Oracle\Inventory
GNS_CONF=false
BIG_CLUSTER=false
LISTENER_USERNAME=domainname\oracle
ASM_DISKS=\\.\ORCLDISKDATA0
ORACLE_HOME=C:\app\oracle\product\12.2.0\grid
CRS_HOME=true
ASM_IN_HOME=true
CRFHOME="C:\app\oracle\product\12.2.0\grid"
ASM_DROP_DISKGROUPS=true
OLD_ACTIVE_ORACLE_HOME=
ASM_LOCAL_SID="+ASM"
JLIBDIR=C:\app\oracle\product\12.2.0\grid\jlib
```

```
VNDR_CLUSTER=false  
ASM_DISK_GROUP=DATA
```

## Downgrading Oracle Restart

Use this procedure to deconfigure and downgrade Oracle Restart, or to troubleshoot Oracle Restart if you receive an error during installation.

To downgrade Oracle Restart, you must first downgrade Oracle Database, deconfigure Oracle Restart, and then reconfigure Oracle Restart.

Also, running the `perl.exe roothas.pl-deconfig -force` with the command flags `-deconfig -force` enables you to deconfigure Oracle Restart without removing the installed binaries. By running `perl.exe roothas.pl-deconfig -force`, you can deconfigure Oracle Restart.

### Note:

Stop any databases, services, and listeners that may be installed and running before deconfiguring and downgrading Oracle Restart.

1. Log in as a member of the Administrators group and go to the directory `Grid_home\bin`, where `Grid_home` is the path to the Oracle Restart home.

2. Downgrade the Oracle Restart resources:

```
srvctl downgrade database -d db_unique_name -o oracle_home -t to_version
```

3. Go to the `Grid_home\crs\install` directory:

```
C: \app\oracle\product\12.2.0\grid\crs\install
```

4. Run `perl.exe roothas.pl -deconfig -force` with the `-deconfig -force` flags to deconfigure Oracle Restart.

```
roothas.pl -deconfig -force
```

5. Deinstall Oracle Restart using the deinstallation tool (`deinstall`).

6. Run `perl.exe root.pl` manually in the earlier release Oracle Restart home to configure Oracle Restart.

If you do not have an earlier release Oracle Restart on your system, then perform an Oracle Restart installation for the respective release to install Oracle Restart.



# A

## Installing Java Access Bridge

Learn how to install Java Access Bridge 2.0.2. Java Access Bridge 2.0.2 enables use of a screen reader with Oracle components:

- [Overview of Java Access Bridge 2.0.2](#)  
Java Access Bridge 2.0.2 enables assistive technologies to read Java applications running on the Windows platform.
- [Setting Up Java Access Bridge 2.0.2](#)  
Learn how to install and configure Java Access Bridge 2.0.2 for Windows after installing Oracle components.

### Overview of Java Access Bridge 2.0.2

Java Access Bridge 2.0.2 enables assistive technologies to read Java applications running on the Windows platform.

Assistive technologies can read Java-based interfaces, such as Oracle Universal Installer and Oracle Enterprise Manager Database Express.

For a list of supported system configurations, including supported versions of Microsoft Windows and Java SE, see section "Supported System Configuration" available at the following link location:

<http://docs.oracle.com>

During installation, Oracle Universal Installer uses the Java Runtime Environment (JRE) 1.8 contained in an Oracle Database installation media. The JRE enables the use of Java Access Bridge during installation.

#### Related Topics

- [Setting Up Java Access Bridge 2.0.2](#)  
Learn how to install and configure Java Access Bridge 2.0.2 for Windows after installing Oracle components.

### Setting Up Java Access Bridge 2.0.2

Learn how to install and configure Java Access Bridge 2.0.2 for Windows after installing Oracle components.

To set up Java Access Bridge 2.0.2 on a Windows 64-bit operating system, follow these steps:

1. Go to Java Standard Edition 2 (Java SE) Downloads page to download the latest build of JDK 8:

<http://docs.oracle.com>

2. Install JDK 8 after accepting the Oracle license agreement.

 **Note:**

You must have administrator privileges to install JDK on Windows.

3. Download and install screen reader, JAWS:  
<http://www.freedomscientific.com/downloads/jaws/JAWS-downloads.asp>
4. Press Windows key+U to open the Ease of Access Center, and select **Use the computer without a display**.
5. Select **Enable Accessbridge** check box. Click **Save** to save the changes.
6. Download Java Access Bridge 2.0.2:  
<http://docs.oracle.com>  
Download the `accessbridge-2_0_2-fcs-bin-b06.zip` file, after accepting the Oracle license agreement.
7. Extract `accessbridge-2.0.2` to a directory on your system where you plan to install Java Access Bridge. For example, name the directory as follows:  
`AB_HOME`
8. Copy `AB_HOME\WindowsAccessBridge-64.dll` to `c:\windows\system32` and start the screen reader.
9. Open the command prompt and navigate to `setup.exe` file.
10. Run the following command once you are in the `Disk1` directory:  
`setup.exe`  
Oracle Universal Installer starts and JAWS is able to read all prompts and controls on the screen.
11. Once you click the **Install** button, you must open Windows Explorer to see the directory where the database is installed (`DRIVE_LETTER:\app\username\product\12.2.0\dbhome_1`), until the JDK folder is created. Once the JDK folder is created, you must copy the files from the Java Access Bridge source location to the JDK destination folder. Copying these files enables accessibility for both the Oracle Database Configuration Assistant and Oracle Net Configuration Assistant.

**Table A-1 Copy Files to JDK Directory on Windows 64-Bit**

Copy	To
<code>AB_HOME\JavaAccessBridge-64.dll</code>	<code>dbhome_1\jdk\jre\bin</code>
<code>AB_HOME\JAWTAccessBridge-64.dll</code>	<code>dbhome_1\jdk\jre\bin</code>
<code>AB_HOME\Accessibility.properties</code>	<code>dbhome_1\jdk\jre\lib</code>
<code>AB_HOME\Access-bridge-64.jar</code>	<code>dbhome_1\jdk\jre\lib\ext</code>
<code>AB_HOME\jaccess.jar</code>	<code>dbhome_1\jdk\jre\lib\ext</code>

# B

## Optimal Flexible Architecture

Oracle Optimal Flexible Architecture (OFA) rules are a set of configuration guidelines created to ensure well-organized Oracle installations, which simplifies administration, support and maintenance.

- [About the Optimal Flexible Architecture Standard](#)  
Oracle Optimal Flexible Architecture (OFA) rules help you to organize database software and configure databases to allow multiple databases, of different versions, owned by different users to coexist.
- [Changes to the Optimal Flexible Architecture for Oracle Database](#)  
The Optimal Flexible Architecture recommended Oracle home path is similar to the following:
- [Directory Tree Differences by Release](#)  
Optimal Flexible Architecture has necessitated changes to the Oracle Database directory tree.
- [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.
- [Optimal Flexible Architecture and Multiple Oracle Home Configurations](#)  
Learn about the various Optimal Flexible Architecture and multiple Oracle homes configurations.
- [Comparison Between Optimal Flexible Architecture on Windows and UNIX](#)  
You can implement Optimal Flexible Architecture on Windows and UNIX in a similar manner.
- [Optimal Flexible Architecture Structure File Mapping](#)  
The following table shows a hierarchical file mapping for the log files of a sample Optimal Flexible Architecture-compliant installation in the `orcl` database:

### About the Optimal Flexible Architecture Standard

Oracle Optimal Flexible Architecture (OFA) rules help you to organize database software and configure databases to allow multiple databases, of different versions, owned by different users to coexist.

In earlier Oracle Database releases, the OFA rules provided optimal system performance by isolating fragmentation and minimizing contention. In current releases, OFA rules provide consistency in database management and support, and simplifies expanding or adding databases, or adding additional hardware. By default, Oracle Universal Installer places Oracle Database components in directory locations and with permissions in compliance with the OFA rules. Oracle recommends that you configure all Oracle components on the installation media in accordance with the OFA guidelines. Oracle recommends that you accept the OFA default.

- [About Multiple Oracle Homes Support](#)  
Oracle Database supports multiple Oracle homes.

## About Multiple Oracle Homes Support

Oracle Database supports multiple Oracle homes.

You can install this release or earlier releases of the software more than once on the same system, in different Oracle home directories.

Careful selection of mount point names can make Oracle software easier to administer. Configuring multiple Oracle homes in compliance with the Optimal Flexible Architecture (OFA) rules provides the following advantages:

- You can install this release, or earlier releases of the software, more than once on the same system, in different Oracle home directories. However, 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 12c software into an existing Oracle 11g Oracle home directory
- Oracle Database Client can be installed in the same Oracle Database home if both products are at the same release level. For example, you can install Oracle Database Client 12.1.0.1 into an existing Oracle Database 12.1.0.1 home, but you cannot install Oracle Database Client 12.1.0.1 into an existing Oracle Database 12.1.0.2 home. If you apply a patch set before installing the client, then you must apply the patch set again.
- Structured organization of directories and files, and consistent naming of the database files simplify database administration.
- Distribution of I/O across multiple disks prevents performance bottlenecks caused by multiple read or write commands issued simultaneously to a single drive.
- Distribution of applications across multiple disks safeguards against database failures.
- Login home directories are not at risk when database administrators add, move, or delete Oracle home directories.
- Multiple databases, of different versions, owned by different users can coexist concurrently.
- Software upgrades can be tested in an Oracle home in a separate directory from the Oracle home where your production database is located.

## Changes to the Optimal Flexible Architecture for Oracle Database

The Optimal Flexible Architecture recommended Oracle home path is similar to the following:

```
c:\app\username\product\12.2.0\dbhome_1
```

The `ORACLE_BASE` default does not contain version information but the default `ORACLE_HOME` does.

## Directory Tree Differences by Release

Optimal Flexible Architecture has necessitated changes to the Oracle Database directory tree.

The differences are listed as follows:

- [Top-Level Oracle Directory](#)  
When you install an Oracle Database Optimal Flexible Architecture-compliant database, there is a top-level Oracle base directory, `DRIVE_LETTER: \app \username`, where `DRIVE_LETTER` is the hard drive letter.
- [Database File Names](#)  
Database files do not have the `SID` in the database file name.
- [Database File Name Extensions](#)  
In an Optimal Flexible Architecture-compliant release, database file names have the following extensions:

### Top-Level Oracle Directory

When you install an Oracle Database Optimal Flexible Architecture-compliant database, there is a top-level Oracle base directory, `DRIVE_LETTER: \app \username`, where `DRIVE_LETTER` is the hard drive letter.

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

### Database File Names

Database files do not have the `SID` in the database file name.

For example, the first control file is named `control01.ctl`. The `SID` in the file name is not necessary because all the database files for a particular database are placed in `\oradata` under a directory called `DB_UNIQUE_NAME` that is named for that database.

### Database File Name Extensions

In an Optimal Flexible Architecture-compliant release, database file names have the following extensions:

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

## 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.

The naming conventions used for top-level directories of an Optimal Flexible Architecture-compliant database directory tree are as follows:

- [ORACLE\\_BASE Directory Naming Convention](#)  
The Oracle base directory is the database home directory for Oracle Database installation owners. Learn about the Oracle base directory and its naming conventions.
- [ORACLE\\_HOME Directory Naming Convention](#)  
By default, Oracle Universal Installer configures Oracle home directories using these Oracle Optimal Flexible Architecture conventions.
- [Automatic Diagnostic Repository \(ADR\) Directory](#)  
Oracle Database 11g onwards, Automatic Diagnostic Repository directories replace the `bdump`, `cdump`, and `udump` directories for the database.
- [ADMIN Directory](#)  
Database administration files are stored in the subdirectories of `ORACLE_BASE\admin\DB_UNIQUE_NAME`.
- [ORADATA Directory](#)  
Database files are stored in `ORACLE_BASE\oradata\DB_UNIQUE_NAME`.
- [RECOVERY\\_AREA Directory](#)  
The `recovery_area` directory stores and manages files related to backup and recovery.

## ORACLE\_BASE Directory Naming Convention

The Oracle base directory is the database home directory for Oracle Database installation owners. Learn about the Oracle base directory and its naming conventions.

`ORACLE_BASE` is the root of the Oracle directory tree. If you install an Optimal Flexible Architecture-compliant database using Oracle Universal Installer default settings, then `ORACLE_BASE` is `DRIVE_LETTER:\app\username`.

If you are installing Oracle Database for Microsoft Windows on a computer with no other Oracle software installed, then you can change the `ORACLE_BASE` directory before running Oracle Universal Installer. Most users do not need or want to do this.

Do not change the value of `ORACLE_BASE` after you run Oracle Universal Installer for the first time. If there is an existing `ORACLE_BASE` and you change it, then there is a conflict of Oracle base directories. If you create another `ORACLE_BASE` when the original `ORACLE_BASE` exists, then certain tools and the database are not able to find previously created files. They look for them in the new `ORACLE_BASE` instead of the original `ORACLE_BASE`.



### See Also:

Your operating system documentation for instructions about editing the environment variables

## ORACLE\_HOME Directory Naming Convention

By default, Oracle Universal Installer configures Oracle home directories using these Oracle Optimal Flexible Architecture conventions.

The `ORACLE_HOME` directory is located under `DRIVE_LETTER:\ORACLE_BASE`, where `DRIVE_LETTER:\` is any hard drive, and contains subdirectories for the 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 the default settings, then the first directory that you create is called `\dbhome_1`.

## Automatic Diagnostic Repository (ADR) Directory

Oracle Database 11g onwards, Automatic Diagnostic Repository directories replace the `bdump`, `cdump`, and `udump` directories for the database.

The diagnostic data goes into `ORACLE_BASE\diag\rdbms\DB_UNIQUE_NAME\instance_name`

Some of these subdirectories are:

```
\alert
\hm
\incident
\incpkg
\ir
\lck
\metadata
\stage
\sweep
\trace
```



### See Also:

*Oracle Database Administrator's Guide*

## ADMIN Directory

Database administration files are stored in the subdirectories of `ORACLE_BASE\admin` `\DB_UNIQUE_NAME`.

## ORADATA Directory

Database files are stored in `ORACLE_BASE\oradata\DB_UNIQUE_NAME`.

Names and brief descriptions of these files are:

```
CONTROL01.CTL  --control file 1
CONTROL02.CTL  --control file 2
CONTROL03.CTL  --control file 3
EXAMPLE01.DBF  --EXAMPLE tablespace data files
```

```

SYSaux01.dbf      --SYSaux tablespace data files
SYSTEM01.dbf     --SYSTEM tablespace data file
TEMP01.dbf       --TEMP tablespace data file
USERS01.dbf      --USERS tablespace data file
*.dbf            --data files corresponding to each tablespace in your database
REDO01.LOG       --redo log file group one, member one
REDO02.LOG       --redo log file group two, member one
REDO03.LOG       --redo log file group three, member one
    
```

 **Note:**

This directory structure allows for disk striping on UNIX and Windows platforms.

**Related Topics**

- [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.

## RECOVERY\_AREA Directory

The `recovery_area` directory stores and manages files related to backup and recovery.

It contains a subdirectory for each database on the system. A fast recovery area is an optional disk location that you can use to store recovery-related files such as control files and online redo log copies, archived logs, flashback logs, and Oracle Database Recovery Manager (RMAN) backups. Oracle and RMAN manage files in the fast recovery area automatically.

 **See Also:**

*Oracle Database Backup and Recovery User's Guide*

## Optimal Flexible Architecture and Multiple Oracle Home Configurations

Learn about the 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 form of:
- [Installing a Default Optimal Flexible Architecture Database: Example 1](#)  
This example shows how to create all Oracle homes within one Oracle base directory.



- [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.

## Specifying an ORACLE\_HOME Directory

To install an Optimal Flexible Architecture-compliant database, you must specify an Oracle home directory in the form of:

```
DRIVE_LETTER:\app\username\product\12.2.0\dbhome_1
```

where:

- `DRIVE_LETTER:\` is any hard drive. For example, `c:\`
- `lapp\` is the `ORACLE_BASE` before performing the installation.
- `dbhome_1` is the default directory name.

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

- `c:\apptest1\product\12.2.0\dbhome_1`
- `d:\apptest2\product\12.2.0\dbhome_1`

## Installing a Default Optimal Flexible Architecture Database: Example 1

This example shows how to create all Oracle homes within one Oracle base directory.

1. Install any Oracle Database that supports Optimal Flexible Architecture (Oracle Database Release 8.1.6 or later) on a computer with no other Oracle software installed and ensure that you accept the default settings for the Oracle home (for example, `c:\app\username\product\12.2.0\dbhome_1`).
2. Install any Oracle Database in a second Oracle home accepting the default settings.

The following table 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:\app\username</code> (same for all Oracle homes)
Oracle home 1	<code>c:\app\username\product\12.2.0\dbhome_1</code>
Oracle home 2	<code>c:\app\username\product\12.2.0\dbhome_2</code>

## 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`).

The table shows the nondefault Optimal Flexible Architecture database settings for this example:

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

Setting	Value
<code>ORACLE_BASE</code>	<code>X:\xyz\oracle</code> (same for both Oracle homes)
Oracle home 1	<code>X:\xyz\oracle\abc</code>
Oracle home 2	<code>X:\pqr</code>

The resulting directory tree looks similar to this:

```
X:\pqr                                --Oracle home 2
  \bin
  \network
X:\xyz
  \oracle                              --ORACLE_BASE for both Oracle homes
  \abc                                  --Oracle home 1
  \bin
  \network
  \admin
  \DB_UNIQUE_NAME1
  \dpdump
  \
  \DB_UNIQUE_NAME2
  \...
  \oradata
  \DB_UNIQUE_NAME1
  CONTROL01.CTL
  CONTROL02.CTL
  CONTROL03.CTL
  EXAMPLE01.DBF
  SYSAUX01.DBF
  SYSTEM01.DBF
  TEMP01.DBF
  USERS01.DBF
  REDO01.LOG
  REDO02.LOG
```

```
REDO03.LOG  
\DB_UNIQUE_NAME2
```

## Comparison Between Optimal Flexible Architecture on Windows and UNIX

You can implement Optimal Flexible Architecture on Windows and UNIX in a similar manner.

- **Directory Naming**  
Top-level names of the Optimal Flexible Architecture directory tree differ between Windows and UNIX.
- **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_HOMENAME`).
- **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.

### 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_HOMENAME`).

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.

On Windows, you can use volume mount points to mount files on different hard drives to a single directory. You can have `oradata` directories on multiple drives, with data files in each one, on Windows version which does not support volume mount points.

Oracle recommends that you use one logical drive to store your database administration files and that you place other files, as needed, on other logical drives in an `oradata\DB_UNIQUE_NAME` directory.

In the following example, there are four logical drives for a database named `prod`:

- `c:\` contains an Oracle home and database administration files.
- `f:\` contains redo log files. The `F:\` drive could also represent two physical drives that have been striped to increase performance.
- `g:\` contains one of the control files and all tablespace files. The `G:\` drive can also use a RAID Level-5 configuration to increase reliability.
- `h:\` contains the second control file.

The directory structure looks similar to this:

```
c:\app\username\product\11.2.0  --First logical drive
  \dbhome_1                    --Oracle home
  \bin                         --Subtree for Oracle binaries
  \network                     --Subtree for Oracle Net
  \...
  \admin                       --Subtree for database administration files
  \prod                        --Subtree for prod database administration files
  \adump                       --Audit files
  \dpdump                      --Default directory for data pump operations.
  \pfile                       --Initialization response file

f:\app\username\product\11.2.0  --Second logical drive (two physical drives,
striped)
  \oradata                    --Subtree for Oracle Database files
  \prod                       --Subtree for prod database files
  redo01.log                  --Redo log file group one, member one
  redo02.log                  --Redo log file group two, member one
  redo03.log                  --Redo log file group three, member one

g:\app\username\product\11.2.0  --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:\app\username\product\11.2.0  --Fourth logical drive
  \oradata                    --Subtree for Oracle Database files
  \prod                       --Subtree for prod database files
  CONTROL02.CTL              --Control file 2
```

# Optimal Flexible Architecture Structure File Mapping

The following table shows a hierarchical file mapping for the log files of a sample Optimal Flexible Architecture-compliant installation in the `orcl` database:

**Table B-3 Hierarchical File Mapping for Log Files in an Optimal Flexible Architecture Installation**

Directory	Description
<code>C:\app\username\admin\orcl\TAR</code>	Subtree for support log files
<code>C:\app\username\admin\orcl\arch</code>	Archived log files
<code>C:\app\username\admin\orcl\create\</code>	Contains the database creation log files
<code>C:\app\username\oradata\orcl\*.log</code>	Redo log files
<code>C:\app\username\admin\orcl\dpdump\</code>	Contains the data pump file <code>dp.log</code>
<code>C:\app\username\diag</code>	Contains all database, listener, sqlnet and other diagnostic logs
<code>C:\app\username\audit</code>	Contains all audit logs
<code>C:\app\username\cfgtoollogs</code>	Contains logs for configuration assistants such as Oracle Database Configuration Assistant, Database Upgrade Assistant, and Oracle Net Configuration Assistant

# C

## Installing and Configuring Oracle Database Using Response Files

Learn how to install and configure Oracle products using response files.

- [How Response Files Work](#)  
Response files can assist you with installing an Oracle product multiple times on multiple computers.
- [Preparing a Response File](#)  
Learn about the methods that you can use to prepare a response file for use during silent-mode or response file-mode installations.
- [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.
- [Running Net Configuration Assistant Using a Response File](#)  
When you run Net Configuration Assistant with a response file, you run it in a silent mode.
- [Running Oracle Database Configuration Assistant Using a Response File](#)  
You can run Oracle Database Configuration Assistant in a silent or a response file mode to configure and start an Oracle database on your system.
- [Postinstallation Configuration Using Response File Created During Installation](#)  
To run a response file configuration after installing Oracle software:
- [Postinstallation Configuration Using the ConfigToolAllCommands Script](#)  
You can create and run a response file configuration after installing Oracle software. The `configToolAllCommands` script requires users to create a second response file, of a different format than the one used for installing the product.
- [Using the Installation Response File for Postinstallation Configuration](#)  
Starting with Oracle Database 12c release 2 (12.2), you can use the response file created during installation to also complete postinstallation configuration.
- [Oracle Database Software Requirements](#)  
The following table lists the software requirements for Oracle Database on Windows x64:

## Oracle Database Software Requirements

The following table lists the software requirements for Oracle Database on Windows x64:

**Table C-1 Windows x64 Software Requirements**

Requirement	Value
Operating System	<p>Oracle Database for Windows x64 is supported on the following operating systems:</p> <ul style="list-style-type: none"> <li>• Windows 7 x64 - Professional, Enterprise, and Ultimate editions</li> <li>• Windows 8 x64 and Windows 8.1 x64 - Core, Pro, and Enterprise editions</li> <li>• Windows 8.1 x64 - Pro and Enterprise editions</li> <li>• Windows 10 x64 - Pro, Enterprise, and Education editions</li> <li>• Windows Server 2012 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>• Windows Server 2012 R2 x64 - Standard, Datacenter, Essentials, and Foundation editions</li> <li>• Windows Server 2016 x64 - Standard, Datacenter, and Essentials editions</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>• Windows Multilingual User Interface Pack is supported.</li> <li>• The Server Core option is not supported.</li> </ul>
Compiler	<p>The following components are supported with the Microsoft Visual C++ 2013 Update 4, Microsoft Visual C++ 2015 Update 3, and Intel 14.0 C compilers:</p> <ul style="list-style-type: none"> <li>• Oracle Call Interface</li> <li>• External callouts</li> <li>• Pro*C/C++</li> <li>• Oracle XML Developer's Kit (XDK)</li> </ul> <p>Oracle C++ Call Interface supports:</p> <ul style="list-style-type: none"> <li>• Microsoft Visual C++ 2013 Update 4</li> <li>• Microsoft Visual C++ 2015 Update 3 - OCCI libraries are installed under <code>ORACLE_HOME\oci\lib\msvc\vc14</code>. When developing OCCI applications with MSVC++ 2015, ensure that the OCCI libraries are correctly selected from this directory for linking and executing.</li> <li>• Intel 14.0 C compilers with Microsoft Visual Studio 2013 STLs</li> </ul> <p>Pro*COBOL supports:</p> <ul style="list-style-type: none"> <li>• Micro Focus Visual COBOL 2.2 - Update 2</li> </ul>
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"> <li>• TCP/IP</li> <li>• TCP/IP with SSL</li> <li>• Named Pipes</li> </ul>

**Table C-1 (Cont.) Windows x64 Software Requirements**

Requirement	Value
Oracle Database Client	<p>To connect to Oracle Database 12c Release 2 (12.2), the following are required:</p> <ul style="list-style-type: none"> <li>• Oracle Database Client is version 10.2.0.5 or higher.</li> <li>• If the earlier Oracle Database Client is running on the same computer as Oracle Database 12c Release 2 (12.2), then you cannot use a bequeath connection.</li> </ul> <p>Oracle recommends upgrading Oracle Database Client to the latest patchset (10.2.0.5, or 11.2.0.4 or later). You can download the patchset from the Patches and Updates section of My Oracle Support at</p> <p><a href="https://support.oracle.com">https://support.oracle.com</a></p>

 **See Also:**

- <https://support.oracle.com> My Oracle Support Note 1563794.1 for more information about Hyper-V support
- [Hardware and Software Certification](#) for information about how to access the latest system requirements

## How Response Files Work

Response files can assist you with installing an Oracle product multiple times on multiple computers.

When you start Oracle Universal Installer (OUI), you can use a response file to automate the installation and configuration of Oracle software, either fully or partially. OUI uses the values contained in the response file to provide answers to some or all installation prompts.

Typically, the installer runs in an interactive mode, which means that it prompts you to provide information on the graphical user interface (GUI). 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:** If you include responses for all of the prompts in the response file and specify the `-silent` option when starting the installer, then it runs in the silent mode. During a silent mode installation, the installer does not display any screens. Instead, it displays progress information in the terminal that you used to start it.
- **Response file mode:** If you include responses for some or all of the prompts in the response file and omit the `-silent` option, then the installer runs in the response file mode. During a response file mode installation, the installer displays all the screens. The screens for which you specify information in the response file, and for those which you did not specify the required information in the response file. To use the response file mode, run `setup.exe` without the `-silent` parameter, but include the response file or any other parameters that apply.



You define the settings for a silent or a response file installation by entering values for the variables listed in the response file. For instance, to specify the Oracle home, provide the appropriate value for the `ORACLE_HOME` variable, as in the following example:

```
ORACLE_HOME="C:\app\product"
```

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

```
DRIVE_LETTER:\setup.exe_location> setup -silent "ORACLE_HOME=C:\app\product" ...
```

This method supports only the Oracle Home User passwords.

- [Reasons for Using Silent Mode or Response File Mode](#)  
Review this section for use cases for running the installer in silent mode or response file mode.
- [Using Response Files](#)  
Review this information to use response files.

 **See Also:**

- *Oracle Universal Installer and OPatch User's Guide for Windows and UNIX*
- My Oracle Support website for more information about response files:  
<https://support.oracle.com/>

## Reasons for Using Silent Mode or Response File Mode

Review this section for use cases for running the installer in silent mode or response file mode.

**Table C-2 Reasons for Using Silent Mode or Response File Mode**

Mode	Uses
Silent	<p>Use silent mode to:</p> <ul style="list-style-type: none"> <li>• Complete an unattended installation, which you schedule using operating system utilities such as <code>at</code>.</li> <li>• Complete several similar installations on multiple systems without user interaction.</li> <li>• Install the software on a system that does not have X Window System software installed on it.</li> </ul> <p>The installer displays progress information on the terminal that you used to start it, but it does not display any of the installer screens.</p>
Response file	<p>Use response file mode to complete similar Oracle software installations on more than one system, providing default answers to some, but not all of the installer prompts.</p> <p>If you do not specify information required for a particular installer screen in the response file, then the installer displays that screen. It suppresses screens for which you have provided all of the required information.</p>

## Using Response Files

Review this information to use response files.

Use the following general steps to install and configure Oracle products using the installer in silent or response file mode:

1. If you plan to use Oracle Automatic Storage Management and configure new disks, then you must perform the following steps:

- a. Create partitions for DAS or SAN disks.
- b. Manually configure the disks using the `asmtoolg` or `asmtool` utility.

2. Customize or create a response file for the installation settings that you need.

You can create the response file by using one of the following methods:

- Modify one of the sample response files that is provided with the installation.
- Run Oracle Universal Installer at a command prompt and save the inputs by selecting the **Save Response File** option.

3. Run Oracle Universal Installer from a command prompt, specifying the response file, using either silent or response file mode.

 **Note:**

Windows requires Administrator privileges at the command prompt.

### Related Topics

- [ASM Disk Group Options for Interactive and Noninteractive Installation](#)  
You can select new disk groups during interactive installations, but you must use existing disk groups for noninteractive installations.
- [Configuring Disks Manually for Oracle Automatic Storage Management](#)  
To use Oracle Automatic Storage Management with direct attached storage (DAS) or storage area network (SAN), the disks must be stamped with a header.
- [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.

## Preparing a Response File

Learn about the methods that you can use to prepare a response file for use during silent-mode or response file-mode installations.

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

## Editing a Response File Template

Oracle provides response file templates for each product and the installation type, and for each configuration tool. These files are located in the `ORACLE_BASE\ORACLE_HOME\assistants` directory, and the `database\response` directory on the Oracle Database installation media.

 **Note:**

If you copied the software to a hard disk, the response files are located in the `stage_area\database\response` directory.

The following table lists the available sample response files:

All response file templates contain comment entries, sample formats, examples, and other useful instructions. Read the response file instructions to understand how to specify values for the response file variables, so that you can customize your installation.

**Table C-3 Response Files**

Response File Name	Description
<code>db_install.rsp</code>	Silent installation of Oracle Database 12c
<code>grid_install.rsp</code>	Silent installation of Oracle Grid Infrastructure
<code>dbca.rsp</code>	Silent installation of Database Configuration Assistant
<code>netca.rsp</code>	Silent installation of Oracle Net Configuration Assistant

 **Caution:**

When you modify a response file template and save a file for use, the response file may contain plain text passwords. Ownership of the response file must be given to the Oracle software installation owner only. Oracle strongly recommends that database administrators or other administrators delete or secure response files when they are not in use.

To copy and modify a response file:

1. Copy the appropriate response files from the `database\response` directory on the Oracle Database media to your hard drive.
2. Modify the response files with a text file editor.
3. Run the response file.

## Related Topics

- [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.
- Oracle Universal Installer and OPatch User's Guide for Windows and UNIX

## Saving a Response File

You can use the Oracle Universal Installer in an interactive mode to save a response file, which you can edit and then use to complete a silent mode or a response file mode installation.

Starting with Oracle Database 11g Release 2 (11.2), you can save all the installation steps into a response file during installation by clicking **Save Response File** on the Summary page. You can use the generated response file for a silent installation later.

When you save the response file, you can either complete the installation, or you can exit from Oracle Universal Installer on the Summary page, before it starts to copy the software to the system.

 **Note:**

Oracle Universal Installer does not save passwords in the response file.

To save a response file:

1. Ensure that the computer on which you are creating the response file has met the requirements described in Oracle Database Preinstallation Tasks.

When you run Oracle Universal Installer to save a response file, it checks the system to verify that it meets the requirements to install the software. For this reason, Oracle recommends that you complete all of the required preinstallation tasks and save the response file while completing an installation.

2. At the command prompt, use the `cd` command to change to the directory that contains the Oracle Universal Installer `setup.exe` executable.

 **Note:**

Windows requires the Administrator privileges at the command prompt.

On the installation DVD, `setup.exe` is located in the `database` directory. Alternatively, navigate to the directory where you downloaded or copied the installation files.

3. Run `setup.exe`.
4. After Oracle Universal Installer starts, enter the installation settings, to save the response file.
5. When the installer displays the Summary screen, perform the following:

- a. Click **Save Response File** and specify a file name and location for the response file. Then, click **Save** to save the values to the file.
  - b. Click **Finish** to continue with the installation.  
Click **Cancel** if you do not want to continue with the installation. The installation stops, but the saved response file is retained.
6. Before you use the saved response file on another system, edit the file and make any required changes.  
Use the instructions in the file as a guide when editing it.

### Related Topics

- [Oracle Database Preinstallation Tasks](#)  
Review the preinstallation tasks before you start Oracle Universal Installer.

## Running Oracle Universal Installer Using the Response File

At this stage, you are ready to run Oracle Universal Installer at the command line, specifying the response file you created, to perform the installation.

On Windows, open the command prompt with Administrator privileges. The Oracle Universal Installer executable, `setup.exe`, provides several options. For help information about the full set of these options, run `setup.exe` with the `-help` option, for example:

```
DRIVE_LETTER:\setup.exe_location setup -help
```

A new command window with the "Preparing to launch..." message appears.

To run Oracle Universal Installer, and specify a response file:

1. Place the response file on the computer where you want to install Oracle Database.
2. At a command prompt, run Oracle Universal Installer with the appropriate response file. On Windows, you must open command prompt with the Administrator privileges. For example:

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

where:

- `filename`: Identifies the full path of the response file.
- `setup.exe_location`: Indicates the location of `setup.exe`.
- `-silent`: Runs Oracle Universal Installer in silent mode and suppresses the Welcome window.
- `"variable=setting"` refers to a variable within the response file that you may prefer to run at the command line rather than set in the response file. Enclose the variable and its setting in quotes.
- `-noconfig`: Suppresses running the configuration assistants during installation, performing a software-only installation instead.
- `-nowait`: Closes the console window when the silent installation completes.

If you save a response file during a silent installation, then Oracle Universal Installer saves the variable values that were specified in the original source response file into the new response file.

 **See Also:**

*Oracle Universal Installer and OPatch User's Guide for Windows and UNIX*

## Running Net Configuration Assistant Using a Response File

When you run Net Configuration Assistant with a response file, you run it in a 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 a silent mode, use the `netca.rsp` response file in the `ORACLE_BASE\ORACLE_HOME\assistants\netca` directory, and the `response` directory in the `database\response` directory on the DVD.

 **Note:**

If you copied the software to a hard disk, the response files are located in the `stage_area\database\response` directory.

On Windows, you must open command prompt with the Administrator privileges.

To create a Net Configuration Assistant response file:

1. Copy the `netca.rsp` response file template from the response file directory to a directory on your system.

The `netca.rsp` is located in the `database\response` directory on the Oracle Database installation media.

2. Open the response file in a text editor.
3. Edit the file, following the instructions in the file.

Net Configuration Assistant fails if you do not correctly configure the `netca.rsp` response file.

To run Net Configuration Assistant using the response file you just created, run Net Configuration Assistant in silent mode as follows, replacing `local_dir` with the directory where you placed your version of the `netca.rsp` response file:

```
C:\ORACLE_HOME\bin> netca /silent /responsefile local_dir\netca.rsp
```

For example:

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

## Running Oracle Database Configuration Assistant Using a Response File

You can run Oracle Database Configuration Assistant in a silent or a response file mode to configure and start an Oracle database on your system.

To run Oracle Database Configuration Assistant in silent or response file mode, use the `dbca.rsp` response file in the `ORACLE_BASE\ORACLE_HOME\assistants\netca` directory, and the `response` directory in the `database\response` directory on the DVD.



### Note:

If you copied the software to a hard disk, the response files are located in the `stage_area\database\response` directory.

To run Database Configuration Assistant in a response file mode, you must use the `-responseFile` flag in combination with either the `-silent` or `-progressOnly` flag. To run Database Configuration Assistant in response file mode, you must use a graphical display and set the `DISPLAY` environment variable.

On Windows, you must open the command prompt with Administrator privileges.

- [Silent Mode of Database Configuration Assistant](#)  
Use the `-silent` flag in combination with the `-responseFile` flag to set the mode to silent.
- [Running Database Configuration Assistant in Response File Mode](#)  
Use this procedure to run Database Configuration Assistant in response file mode.



### See Also:

- *Oracle Database Administrator's Guide*
- *Oracle Automatic Storage Management Administrator's Guide*

## Silent Mode of Database Configuration Assistant

Use the `-silent` flag in combination with the `-responseFile` flag to set the mode to silent.

In the silent mode, Database Configuration Assistant uses values that you specify, in the response file or as command-line options, to create a database. No window or user interface is displayed in the silent mode.

## Running Database Configuration Assistant in Response File Mode

Use this procedure to run Database Configuration Assistant in response file mode.

To create an Oracle Database Configuration Assistant response file:

1. Copy the `dbca.rsp` response file template from the response file directory to a directory on your system.

The `dbca.rsp` response file is located in the `database\response` directory on the Oracle Database installation media.

2. Open the `dbca.rsp` response file in a text editor.
3. Edit the `dbca.rsp` file, following the instructions in the file.

Oracle Database Configuration Assistant fails if you do not correctly configure the `dbca.rsp` response file.

To run the Oracle Database Configuration Assistant using the response file you just created, run Oracle Database Configuration Assistant in a silent or a response file mode using the following syntax:

```
C:\ORACLE_HOME\bin> dbca {-progressOnly | -silent} -responseFile local_dir/dbca.rsp
```

where:

- `-silent` runs Oracle Database Configuration Assistant in the silent mode
- `-progressOnly` runs Oracle Database Configuration Assistant in the response file mode
- `local_dir` is the full path of the directory where you copied the `dbca.rsp` response file template.

For example:

```
C:\> ORACLE_HOME\bin> dbca -progressOnly -responseFile  
C:\oracle_response_files\mydbca.rsp
```

As an alternative to creating a database using a response file, you can run `dbca` at the command line by specifying all the required information as command line options. Database Configuration Assistant writes progress messages to `stdout`. For information about the list of options supported, enter the following command:

```
C:\ORACLE_HOME\bin\dbca -help
```

## Postinstallation Configuration Using Response File Created During Installation

To run a response file configuration after installing Oracle software:

- [About the Postinstallation Configuration File](#)  
When you run a silent or a response file installation, you provide information about your servers in a response file that you otherwise provide manually during a graphical user interface installation.
- [Running Postinstallation Configuration Using Response File](#)  
Use this procedure to run postinstallation configuration using response file.



## About the Postinstallation Configuration File

When you run a silent or a response file installation, you provide information about your servers in a response file that you otherwise provide manually during a graphical user interface installation.

However, the response file does not contain passwords for user accounts that configuration assistants require after software installation is complete. The configuration assistants are started with a script called `configToolAllCommands`. You can run this script in the response file mode by using a password response file. The script uses the passwords to run the configuration tools in succession to complete the configuration.

If you keep the password file to use for clone installations, then Oracle strongly recommends that you store it in a secure location. In addition, if you must stop an installation to fix an error, you can run the configuration assistants using `configToolAllCommands` and a password response file.

The `configToolAllCommands` password response file consists of the following syntax options:

- *internal\_component\_name* is the name of the component that the configuration assistant configures
- *variable\_name* is the name of the configuration file variable
- *value* is the desired value of the configuration.

The command syntax is as follows:

```
internal_component_name|variable_name=value
```

For example:

```
oracle.crs|S_ASMPASSWORD=myPassWord
```

Oracle strongly recommends that you maintain security with a password response file:

- Permissions on the response file must be set to 600.
- The owner of the response file must be the installation owner user, with the group set to the central inventory (oraInventory) group.

## Running Postinstallation Configuration Using Response File

Use this procedure to run postinstallation configuration using response file.

To run configuration assistants with the `executeConfigTools` script:

1. Create a response file using the syntax *filename.properties*. For example:

```
C:\> copy nul cfgrsp.properties
```
2. Open the file with a text editor, and cut and paste the password template, modifying as needed.
3. Secure the `cfgrsp.properties` file by changing permissions in Properties page. Right-click the file to open the Properties page. Select the **Security** tab, click the **Edit** button, select a group or user, then select **Deny** check box against Read permissions to remove read access for unwanted users.

4. Change directory to `ORACLE_HOME\cfgtoollogs`
5. Before running `configToolAllCommands`, rename it using the following command:

```
copy configToolAllCommands configToolAllCommands.bat
```

6. Run the configuration script using the following syntax:

```
configToolAllCommands.bat RESPONSE_FILE=\path\name.properties
```

for example:

```
C:\> configToolAllCommands.bat RESPONSE_FILE=C:\oracle\cfgrsp.properties
```

### Example C-1 Password response file for Oracle Grid Infrastructure for a Standalone Server

Oracle Grid Infrastructure requires passwords for Oracle Automatic Storage Management Configuration Assistant (ASMCA), and for Intelligent Platform Management Interface Configuration Assistant (IPMICA) if you have a BMC card and you want to enable this feature. Provide the following response file:

```
oracle.crs|S_ASMPASSWORD=password
oracle.crs|S_ASMMONITORPASSWORD=password
oracle.crs|S_OMSPASSWORD=password
oracle.crs|S_BMCPASSWORD=password
oracle.crs|S_WINSERVICEUSERPASSWORD=password
```

### Example C-2 Password response file for Oracle Database

Oracle Database configuration requires the `SYS`, `SYSTEM`, and `DBSNMP` passwords for use with Database Configuration Assistant (DBCA). The `S_ASMSNMPPASSWORD` password is necessary only if the database is using Oracle ASM for storage. Similarly, the `S_PDBADMINPASSWORD` password is necessary only if you create a multitenant container database (CDB) with one or more pluggable databases (PDBs). Also, if you select configure Oracle Enterprise Manager, then provide the password for the Oracle software installation owner for the `S_EMADMINPASSWORD` password.

```
oracle.server|S_SYSPASSWORD=password
oracle.server|S_SYSTEMPASSWORD=password
oracle.server|S_DBSNMPPASSWORD=password
oracle.server|S_PDBADMINPASSWORD=password
oracle.server|S_EMADMINPASSWORD=password
oracle.server|S_ASMSNMPPASSWORD=password
```

If you do not want to enable Oracle Enterprise Manager or Oracle ASM, then leave those password fields blank.

## Postinstallation Configuration Using the ConfigToolAllCommands Script

You can create and run a response file configuration after installing Oracle software. The `configToolAllCommands` script requires users to create a second response file, of a different format than the one used for installing the product.

Starting with Oracle Database 12c Release 2 (12.2), the `configToolAllCommands` script is deprecated and may be desupported in a future release.

## Using the Installation Response File for Postinstallation Configuration

Starting with Oracle Database 12c release 2 (12.2), you can use the response file created during installation to also complete postinstallation configuration.

Run the installer with the `-executeConfigTools` option to configure configuration assistants after installing Oracle Grid Infrastructure or Oracle Database. You can use the response file located at `Oracle_home\install\response\product_timestamp.rsp` to obtain the passwords required to run the configuration tools. You must update the response file with the required passwords before running the `-executeConfigTools` command.

Oracle strongly recommends that you maintain security with a password response file. The owner of the response file must be the installation owner user.

### Example C-3 Response File Passwords for Oracle Grid Infrastructure

```
oracle.install.crs.config.ipmi.bmcPassword=password
oracle.install.asm.SYSASMPassword=password
oracle.install.asm.monitorPassword=password
oracle.install.config.emAdminPassword=password
oracle.install.OracleHomeUserPassword=password
```

If you do not have a BMC card, or you do not want to enable IPMI, then leave the `ipmi.bmcPassword` input field blank.

If you do not want to enable Oracle Enterprise Manager for management, then leave the `emAdminPassword` password field blank.

If you did not specify an Oracle Home user for the Oracle Grid Infrastructure installation, then leave the `OracleHomeUserPassword` field blank.

### Example C-4 Response File Passwords for Oracle Grid Infrastructure for a Standalone Server (Oracle Restart)

```
oracle.install.asm.SYSASMPassword=password
oracle.install.asm.monitorPassword=password
oracle.install.config.emAdminPassword=password
oracle.install.OracleHomeUserPassword=password
```

If you do not want to enable Oracle Enterprise Manager for management, then leave the `emAdminPassword` password field blank.

If you did not specify an Oracle Home user for the Oracle Grid Infrastructure for a Standalone Server (Oracle Restart) installation, then leave the `OracleHomeUserPassword` field blank.

### Example C-5 Response File Passwords for Oracle Database

This example illustrates the passwords to specify for use with the database configuration assistants.

```
oracle.install.db.config.starterdb.password.SYS=password
oracle.install.db.config.starterdb.password.SYSTEM=password
oracle.install.db.config.starterdb.password.DBSNMP=password
oracle.install.db.config.starterdb.password.PDBADMIN=password
oracle.install.db.config.starterdb.emAdminPassword=password
```

```
oracle.install.db.config.asm.ASMSPassword=password  
oracle.install.OracleHomeUserPassword=password
```

You can also specify `oracle.install.db.config.starterdb.password.ALL=password` to use the same password for all database users.

Oracle Database configuration assistants require the SYS, SYSTEM, and DBSNMP passwords for use with Oracle Database Configuration Assistant (DBCA). Specify the following passwords, depending on your system configuration:

- If the database uses Oracle ASM for storage, then you must specify a password for the `ASMSNPASSWORD` variable. If you are not using Oracle ASM, then leave the value for this password variable blank.
- If you create a multitenant container database (CDB) with one or more pluggable databases (PDBs), then you must specify a password for the `PDBADMIN` variable. If you are not using Oracle ASM, then leave the value for this password variable blank.
- If you did not specify an Oracle Home user for the Oracle Database installation, then leave the `OracleHomeUserPassword` field blank.

# D

## Configuring Networks for Oracle Database

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

Configuring networks for Oracle Database describes how to install Oracle Database on computers that do not meet the typical scenario.

- [Installing Oracle Database on Computers with Multiple IP Addresses](#)  
Use this procedure to set the ORACLE\_HOSTNAME Environment Variable.
- [Installing Oracle Database on Computers with Multiple Aliases](#)  
A computer with multiple aliases is registered with the naming service under a single IP address but with multiple aliases.
- [Installing Oracle Database on Nonnetworked Computers](#)  
You can install Oracle Database on non-networked computers.
- [Installing a Loopback Adapter](#)  
When you install a loopback adapter, the loopback adapter assigns a local IP address for your computer.

## Installing Oracle Database on Computers with Multiple IP Addresses

Use this procedure to set the ORACLE\_HOSTNAME Environment Variable.

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

1. Display **System** in the Windows Control Panel.
2. In the System Properties dialog box, click **Advanced**.
3. In the **Advanced** tab, click **Environment Variables**.
4. In the Environment Variables dialog box, under System Variables, click **New**.
5. In the New System Variable dialog box, enter the following information:
  - **Variable name:** ORACLE\_HOSTNAME
  - **Variable value:** The host name of the computer to use.
6. Click **OK**, then in the Environment Variables dialog box, click **OK**.
7. Click **OK** in the Environment Variables dialog box, then in the System Properties dialog box, click **OK**.

## Installing Oracle Database on Computers with Multiple Aliases

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

The naming service resolves any of those aliases to the same computer. Before installing Oracle Database on such a computer, set the `ORACLE_HOSTNAME` environment variable to the computer whose host name you want to use.

## Installing Oracle Database on Nonnetworked Computers

You can install Oracle Database on non-networked computers.

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

2. Ping the computer from itself, using only the host name and using the fully qualified name, which is in the `DRIVE_LETTER:\system32\drivers\etc\hosts` file.

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

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

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

### Note:

When you ping a computer from itself, the `ping` command must return the local IP address (the IP address of the loopback adapter).

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

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.

**Related Topics**

- [Installing Oracle Database on Nonnetworked Computers](#)  
You can install Oracle Database on non-networked computers.

## Installing a Loopback Adapter

When you install a loopback adapter, the loopback adapter assigns a local IP address for your computer.

After the loopback adapter is installed, there are at least two network adapters on your computer: your own network adapter and the loopback adapter. To run Oracle Database on Windows, set the loopback adapter as the primary adapter.

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

A loopback adapter is required if:

- You are installing on a non-networked computer and plan to connect the computer to a network after installation.
- [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:
- [Installing a Loopback Adapter on Windows 7](#)  
Use this procedure to install a loopback adapter on Windows 7.
- [Installing Microsoft KM-TEST Loopback Adapter on Windows 8, Windows 8.1, Windows Server 2012, and Windows Server 2012 R2](#)  
Use this procedure to install Microsoft KM-TEST loopback adapter on different Windows versions.
- [Removing a Loopback Adapter](#)  
Use this procedure to remove a loopback adapter.

**Related Topics**

- [Installing Oracle Database on Nonnetworked Computers](#)  
You can install Oracle Database on non-networked computers.

## Checking if a Loopback Adapter is Installed on Your Computer

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

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

**Note:**

Loopback Adapter installed on the computer must be made the Primary Network Adapter.

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

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

## Installing a Loopback Adapter on Windows 7

Use this procedure to install a loopback adapter on Windows 7.

To install a loopback adapter on Windows 7:

1. Click **Start** and enter `hdwwiz` in the Search box.
2. Click **hdwwiz** to start the Add Hardware wizard.
3. In the Welcome window, click **Next**.
4. In the The wizard can help you install other hardware window, select **Install the hardware that I manually select from a list**, and click **Next**.
5. From the list of hardware types, select the type of hardware you are installing, select **Network adapters**, and click **Next**.
6. In the Select Network Adapter window, make the following selections:
  - **Manufacturer:** Select **Microsoft**.
  - **Network Adapter:** Select **Microsoft Loopback Adapter**.
7. Click **Next**.
8. In the The wizard is ready to install your hardware window, click **Next**.
9. In the Completing the Add Hardware Wizard window, click **Finish**.
10. Click **Manage Network Connections**. This displays the Network Connections Control Panel item.
11. Right-click the connection that was just created. This is usually named "Local Area Connection 2". Choose **Properties**.
12. On the **General** tab, select **Internet Protocol (TCP/IP)**, and click **Properties**.
13. 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)





5. From the list of hardware types, select the type of hardware you are installing, select **Network adapters**, and click **Next**.
6. In the Select Network Adapter window, make the following selections:
  - **Manufacturer**: Select **Microsoft**.
  - **Network Adapter**: Select **Microsoft KM-TEST Loopback Adapter**.

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

## Removing a Loopback Adapter

Use this procedure to remove a loopback adapter.

To remove a loopback adapter, perform the following steps:

1. Display **System** in the Windows Control Panel.
2. In the Hardware tab, click **Device Manager**. This tab is not available with Windows Server 2008. Click **Device Manager** instead.
3. In the Device Manager window, expand **Network adapters**. You must see **Microsoft Loopback Adapter**.
4. Right-click **Microsoft Loopback Adapter** and select **Uninstall**.

In Windows 8, Windows 8.1, Windows Server 2012, or Windows Server 2012 R2, right-click **Microsoft KM-TEST Loopback Adapter** and select **Uninstall**.

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

# E

## Managing Oracle Database Port Numbers

Review default port numbers.

If needed, use these steps to change assigned ports after installation.

- [About Managing Ports](#)  
During installation, Oracle Universal Installer assigns port numbers to the components from a set of default port numbers.
- [About Viewing Port Numbers and Access URLs](#)  
In most cases, the port number of an Oracle Database component is displayed in the tool used to configure the port. In addition, ports for some Oracle Database applications are listed in the `portlist.ini` file.
- [Oracle Database Component Port Numbers and Protocols](#)  
This table lists the port numbers and protocols configured for Oracle Database components during a single-instance installation.
- [Changing the Oracle Services for Microsoft Transaction Server Port](#)  
In most cases, you need not reconfigure the port number.

### About Managing Ports

During installation, Oracle Universal Installer assigns port numbers to the components from a set of default port numbers.

Many Oracle Database components and services use ports. As an administrator, it is important to know the port numbers used by these services, and to ensure that the same port number is not used by two services on your host.

Most port numbers are assigned during installation. Every component and service has an allotted port range, which is the set of port numbers Oracle Database attempts to use when assigning a port. Oracle Database starts with the lowest number in the range and performs the following checks:

- Is the port used by another Oracle Database installation on the host?  
The installation may be up or down at the time; Oracle Database can still detect if the port is used.
- Is the port used by a process that is currently running?  
This could be any process on the host, even a non-Oracle Database process.
- Is the port listed in the `/etc/services` file?

If the answer to any of the preceding questions is yes, then Oracle Database moves to the next highest port in the allotted port range, and continues checking until it finds a free port.

## About Viewing Port Numbers and Access URLs

In most cases, the port number of an Oracle Database component is displayed in the tool used to configure the port. In addition, ports for some Oracle Database applications are listed in the `portlist.ini` file.

This file is located in the `ORACLE_HOME\install` directory.

If you change a port number, that port number is not updated in the `portlist.ini` file. For this reason, the `portlist.ini` file is an accurate record of ports configured at the time of installation.

## Oracle Database Component Port Numbers and Protocols

This table lists the port numbers and protocols configured for Oracle Database components during a single-instance 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
<p>Oracle Net Listener</p> <p>Enables Oracle client connections to the database by using Oracle Net services. You can configure this port number during installation. To reconfigure this port, use Net Configuration Assistant.</p>	1521	<p>Port number changes to the next available port.</p> <p>Modifiable manually to any available port.</p>	TCP
<p>Oracle Connection Manager</p> <p>Listening port for Oracle client connections. It is not configured during installation, but can be configured manually by editing the <code>cman.ora</code> parameter file. You can find the file under <code>/network/admin</code> directory.</p>	1630	1630	TCP
<p>Oracle XML DB</p> <p>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.</p> <p><b>See Also:</b> <i>Oracle XML DB Developer's Guide</i></p>	0	Configured Manually	HTTP
<p>Oracle XML DB Developer's Guide</p> <p>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.</p> <p><b>See Also:</b> <i>Oracle XML DB Developer's Guide</i></p>	0	Configured Manually	FTP
<p>Cluster Synchronization Service (CSS)</p> <p>CSS service internode connection for Group Manager. The port number is assigned automatically. You cannot view or modify it afterward.</p>	42424	Dynamic	TCP

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

Component and Description	Default Port Number	Port Range	Protocol
Oracle Cluster Registry The port number is assigned automatically during installation. You cannot view or modify it afterward.	Dynamic	Dynamic	TCP
Oracle Services for Microsoft Transaction Server The port number for Microsoft Transaction Server is configured when you enter its value in the Oracle Universal Installer the first time you install the software on a particular server. If you install the software in multiple Oracle homes on the same server, then Oracle Universal Installer uses the same port number that you specified during the first installation. In most cases, you do not have to reconfigure the port number.	Dynamic	49152-65535	TCP

**Related Topics**

- [Changing the Oracle Services for Microsoft Transaction Server Port](#)  
In most cases, you need not reconfigure the port number.

 **See Also:**

- *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide* for information on Oracle Management Agent ports
- *Oracle Real Application Clusters Installation Guide for Microsoft Windows x64 (64-Bit)* for a list of clusterware ports used in Oracle components

## Changing the Oracle Services for Microsoft Transaction Server Port

In most cases, you need not reconfigure the port number.

If you must, then you can use the Registry Editor to edit its value in the `HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\OracleMTSRecoveryService\Protid_0` Registry Editor key to any available port within the range 1024 to 65535.

During installation, Oracle Universal Installer takes the value for the port from the key, if it exists. Otherwise, a free port ranging from 49152 to 65535 is chosen.

# F

## Troubleshooting the Oracle Database Installation

Learn how to troubleshoot the Oracle Database installation.

- [Verifying Requirements](#)  
Before you try any of the troubleshooting steps, do the following:
- [Encountering Installation Errors](#)  
If you encounter an error during installation:
- [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.
- [Silent Mode Response File Error Handling](#)  
To determine whether a silent-mode installation succeeds or fails, check the `silentInstallActionsdate_time.log` file, located in `DRIVE_LETTER:\Program Files\Oracle\Inventory\logs`.
- [Troubleshooting Host Name Changes and CSS](#)  
If you change the host name for Oracle Automatic Storage Management, then the Oracle CSS service does not start.
- [Troubleshooting Configuration Assistants](#)  
To troubleshoot an installation error that occurs when a configuration assistant is running:
- [Troubleshooting Inventory Issues](#)  
If you face any of the following situations for Oracle home, then run the `opatch lsinventory -detail` command to list the contents of the inventory.
- [Troubleshooting Screen Display Issues](#)  
If you connect to Oracle database with the screen resolution 640 X 480 or 800 X 600, then the Next button in the GUI is not visible as it hides behind the Taskbar.
- [Cleaning Up After a Failed Installation](#)  
If an installation fails, then you must remove files that Oracle Universal Installer created during the attempted installation and remove the Oracle home directory.
- [Continuing Installations or Upgrades After Server Restarts](#)  
Use this procedure to install or upgrade after server restarts.

### See Also:

- *Oracle Configuration Manager Installation and Administration Guide*

## Verifying Requirements

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

- Check to ensure that the system meets the requirements and that you have completed all of the preinstallation tasks.
- Read the release notes for the product on your platform before installing it. You can find the latest version of the release notes on the Oracle Technology Network website:

<http://docs.oracle.com>

## 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.
- If you encounter an error while a configuration assistant is running.
- If you cannot resolve the problem, remove the failed installation.

### Related Topics

- [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.
- [Silent Mode Response File Error Handling](#)  
To determine whether a silent-mode installation succeeds or fails, check the `silentInstallActionsdate_time.log` file, located in `DRIVE_LETTER:\Program Files\Oracle\Inventory\logs`.
- [Troubleshooting Configuration Assistants](#)  
To troubleshoot an installation error that occurs when a configuration assistant is running:
- [Cleaning Up After a Failed Installation](#)  
If an installation fails, then you must remove files that Oracle Universal Installer created during the attempted installation and remove the Oracle home directory.

## Reviewing the Log of an Installation Session

During an installation, Oracle Universal Installer records all the actions that it performs in a log file. If you encounter problems during the installation, review the log file for information about possible causes of the problem.

By default, the log files are located in the following directory:

`SYSTEM_DRIVE:\Program Files\Oracle\Inventory\logs`

Log filenames from interactive installations take the form:

```
installActionsdate_time.log  
oraInstalldate_time.err  
oraInstalldate_time.out
```

For example, if an interactive installation occurred at 9:00:56 a.m. on October 14, 2005, then the log file is 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.

### Related Topics

- [Silent Mode Response File Error Handling](#)  
To determine whether a silent-mode installation succeeds or fails, check the `silentInstallActionsdate_time.log` file, located in `DRIVE_LETTER:\Program Files\Oracle\Inventory\logs`.

## Silent Mode Response File Error Handling

To determine whether a silent-mode installation succeeds or fails, check the `silentInstallActionsdate_time.log` file, located in `DRIVE_LETTER:\Program Files\Oracle\Inventory\logs`.

A silent installation fails for the following reasons:

- You do not specify a response file.
- You specify an incorrect or an incomplete response file.
- Oracle Universal Installer encounters an error, such as insufficient disk space.

Oracle Universal Installer or a configuration assistant validates the response file at run time. If the validation fails, the silent-mode installation or configuration process ends.

### Related Topics

- [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.

## Troubleshooting Host Name Changes and CSS

If you change the host name for Oracle Automatic Storage Management, then the Oracle CSS service does not start.

In order to solve this problem, perform the following steps:

1. Log in as a user with Administrator privileges.



## 2. Run `roothas.bat` to deconfigure CSS.

```
C:\> cd \app\oracle\product\12.2.0\grid\crs\install
perl roothas.bat -deconfig -force
```

### Note:

Starting with Oracle Database 12c Release 1 (12.1.0.2), the `roothas.bat` script replaces the `roothas.pl` script in the Oracle Grid Infrastructure home.

This removes any configuration related files on the system that referenced the old host name.

## 3. Run `gridconfig.bat` script to reconfigure CSS using the new host name:

```
C:\> cd \app\oracle\product\12.2.0\grid\crs\config
gridconfig.bat
```

## 4. Go to the grid home's `bin` directory. Use the `srvctl add database` command with the `-c SINGLE` flag to add the database in an Oracle Restart configuration. Also use the `srvctl add` command to add the listener, the Oracle ASM instance, all Oracle ASM disk groups, and any database services to the Oracle Restart configuration.

### See Also:

*Oracle Database Administrator's Guide*

# Troubleshooting Configuration Assistants

To troubleshoot an installation error that occurs when a configuration assistant is running:

- Review the installation log files.
- Review the specific configuration assistant log file located in the `ORACLE_BASE\cfgtoollogs` directory. Try to fix the issue that caused the error.

### Note:

Ensure that there is no space in the path.

- If you see the "Fatal Error. Reinstall message", look for the cause of the problem by reviewing the log files.
- [Configuration Assistant Failures](#)  
Oracle Configuration Assistant failures are noted at the bottom of the installation window.

- [Irrecoverable Errors](#)  
Use this procedure if you receive an irrecoverable error while a configuration assistant is running.

**Related Topics**

- [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.
- [Irrecoverable Errors](#)  
Use this procedure if you receive an irrecoverable error while a configuration assistant is running.

## 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

## Irrecoverable Errors

Use this procedure if you receive an irrecoverable error while a configuration assistant is running.

If you receive an irrecoverable error:

1. Remove the failed installation.
2. Correct the cause of the irrecoverable error.
3. Reinstall the Oracle software.

**Related Topics**

- [Cleaning Up After a Failed Installation](#)  
If an installation fails, then you must remove files that Oracle Universal Installer created during the attempted installation and remove the Oracle home directory.

## Troubleshooting Inventory Issues

If you face any of the following situations for Oracle home, then run the `opatch lsinventory -detail` command to list the contents of the inventory.

- Oracle home is cloned without completing the inventory steps.

- There is bad inventory.
- Inventory is not available but it is created when the Oracle Enterprise Manager Agent is installed in a separate Oracle home.

**See Also:**

*Oracle Universal Installer and OPatch User's Guide for Windows and UNIX*

## Troubleshooting Screen Display Issues

If you connect to Oracle database with the screen resolution 640 X 480 or 800 X 600, then the Next button in the GUI is not visible as it hides behind the Taskbar.

In order to counter this problem, do one of the following:

- Hide the Taskbar.
- Move the Oracle Universal Installer screen up.
- Set the screen resolution to 1024 X 768 or higher.

## Cleaning Up After a Failed Installation

If an installation fails, then you must remove files that Oracle Universal Installer created during the attempted installation and remove the Oracle home directory.

## Continuing Installations or Upgrades After Server Restarts

Use this procedure to install or upgrade after server restarts.

During an Oracle Restart installation or upgrade, the server may require a restart and you may see an error similar to the following:

```
ACFS-9427 Failed to unload ADVM/ACFS drivers. A system reboot is recommended
ACFS-9428 Failed to load ADVM/ACFS drivers. A system reboot is recommended
```

The workaround is to perform the following steps:

1. Restart the computer.
2. Log in as the Oracle Installation User for the Oracle home, and run the `gridconfig.bat` script located in the path `Grid_home\crs\config`.
3. To complete the installation or upgrade, run the `configToolAllCommands` script, located in the path `ORACLE_HOME\cfgtoollogs\configToolAllCommands`.

### Related Topics

- [Postinstallation Configuration Using Response File Created During Installation](#)  
To run a response file configuration after installing Oracle software:

# G

## Frequently Asked Questions About Installation

Use the following guidelines to decide how to install Oracle Database components:

- [Installing Oracle Database or Oracle Database Client](#)  
The following are the frequently asked questions about installing Oracle Database:
- [Installing Oracle Database Tools](#)  
The following are frequently asked questions about installing Oracle Database tools:
- [Installing Oracle Database with Oracle Applications](#)  
The following are the frequently asked questions about installing Oracle Database with Oracle applications:
- [Installing Oracle Database Heterogeneous Connectivity Tools \(Gateways\)](#)  
Learn how to access and install Gateway products.

### Installing Oracle Database or Oracle Database Client

The following are the frequently asked questions about installing Oracle Database:

**I only need one instance of Oracle Database or I just want to install a test database to get familiar with the product. How do I install Oracle Database for these situations?**

If you want a quick installation using the default installation settings, then see this guide.

#### See Also:

[Oracle Database Installation Checklist](#) if your site has special requirements

**How can I create an Oracle database that can handle transaction-heavy or data warehousing applications?**

If you want to create a starter database designed for transaction-heavy or data warehousing applications, then see this guide for more details. Select the **Advanced Installation** method, and then select the database type you want on the Select Database Configuration screen.

Alternatively, you can use Oracle OLAP. The OLAP option is provided with Oracle Database Enterprise Edition. Oracle OLAP provides optimal support for database environments that must meet OLAP requirements.

 **See Also:**

- *Oracle OLAP User's Guide*
- *Oracle OLAP DML Reference*
- *Oracle OLAP Java API Reference*
- *Oracle Database Data Warehousing Guide* after installation

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

Use Oracle Universal Installer to install Oracle Database using either of the following methods:

- **Installing with response files:** This method lets you run Oracle Universal Installer at a command line using a response file that contains settings specific to each computer.
- **Cloning a database:** Install Oracle Database on one computer using interactive mode. You can also clone databases.

 **See Also:**

*Oracle Database Administrator's Guide* about instructions for cloning databases

### How do I configure client connections to an Oracle database?

1. Install Oracle Database on a server by using Oracle Universal Installer.
2. Use Oracle Universal Installer to install Oracle Database Client on each client node, and select the Instant Client installation type.

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

If the client nodes only require a default installation into a new Oracle home directory, consider using Oracle Universal Installer.

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

1. Install Oracle Database onto a server by using this guide for more details.
2. Use platform-specific *Client Installation* guide to install Oracle Database Client on each client node, and select the Instant Client installation type.

If you have many client nodes, then consider running Oracle Universal Installer in silent or response file mode.

 **See Also:**

*Oracle Database Client Installation Guide for Microsoft Windows*

**Example G-1 How do I upgrade Oracle Database?**

 **See Also:**

*Oracle Database Upgrade Guide*

**Example G-2 The computers at my site have been configured to run as a cluster. How should I install Oracle Database?**

Use any of the following installation scenarios:

- If you want to run a single-instance Oracle Database in a clustered environment, then install Oracle Grid Infrastructure either before or after you install Oracle Database.
- If you want a consolidated pool of storage for all databases in a cluster, then install Oracle Grid Infrastructure, and use Oracle Automatic Storage Management (Oracle ASM) to manage this storage. Then, install Oracle Database or Oracle Real Application Clusters.
- If you plan to use Oracle Real Application Clusters, first install Oracle Grid Infrastructure, and then install Oracle Real Application Clusters.

Oracle Clusterware is a key component required by Oracle Real Application Clusters installations. Oracle Clusterware is an integrated cluster management solution that can bind multiple servers to act as a single system. This is referred to as a cluster. It performs workload management and component restart. For example, when an instance supporting a particular service fails, Oracle Clusterware restarts the service on the next available instance that you have configured for that service. Oracle Clusterware can monitor non-Oracle programs, if they are defined within the Oracle Clusterware environment using the High Availability API.

See platform-specific instructions for your platform to install Oracle Grid Infrastructure and Oracle Real Application Clusters. Oracle Clusterware is installed in an Oracle Grid Infrastructure installation.

 **See Also:**

- *Oracle Grid Infrastructure Installation Guide*
- *Oracle Real Application Clusters Installation Guide*

**Example G-3 How do I migrate my non-Oracle databases to Oracle Database?**

Use Oracle SQL Developer to migrate your non-Oracle databases and applications to Oracle. Oracle SQL Developer software and documentation is available on Oracle Help Center at:

<http://docs.oracle.com/en/database/database.html?tab=2#sqldev>

# Installing Oracle Database Tools

The following are frequently asked questions about installing Oracle Database tools:

## How do I install Oracle WebLogic Server?



### See Also:

*Oracle Fusion Middleware Installation Guide for Oracle WebLogic Server*

## How can I administer and monitor my Oracle Database products?

To perform regular administrative functions such as creating, configuring, or deleting databases, or managing database templates, use one of the following methods:

To manage only the single database and listener that you are installing:

1. Use Oracle Universal Installer to install Oracle Database.
2. From Oracle Database, use Database Configuration Assistant to manage your databases.

You can also administer and monitor the database with Oracle Enterprise Manager Cloud Control, which is installed by default with Oracle Database. Oracle Enterprise Manager Cloud Control requires an agent which is not installed by default.

Oracle Enterprise Manager Cloud Control includes the Oracle Management Agent, Oracle Management Service, and Oracle Management Repository, as well as Cloud Control, a browser-based central console through which administrators can perform all monitoring, administration, and configuration tasks for the enterprise.

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 Universal Installer to install Oracle Database.  
If you plan to use Oracle Real Application Clusters, then install Oracle Database by using the platform-specific guides.
2. Use *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide* to install and configure Oracle Enterprise Manager. For postconfiguration tasks, use *Oracle Enterprise Manager Cloud Control Administrator's Guide*.

 **See Also:**

- *Oracle Enterprise Manager Cloud Control Advanced Installation and Configuration Guide*
- *Oracle Enterprise Manager Cloud Control Basic Installation Guide*
- *Oracle Enterprise Manager Cloud Control Administrator's Guide*
- *Oracle Real Application Clusters Installation Guide for Microsoft Windows x64 (64-Bit)*

**How do I manage security for my Oracle Database products?**

Oracle provides a wide range of security solutions for your enterprise environment, including centralized administration and security features integrated with Oracle Internet Directory. The set of Oracle security services called Oracle Platform Security integrates the security features built into Oracle Database, Oracle WebLogic Server, and the Oracle Identity Management infrastructure. Combined, these features enable the development and deployment of secure e-business applications.

Oracle Identity Management includes Oracle Internet Directory, a centralized repository that simplifies administration of users and applications in the Oracle environment with the following components:

- Oracle Internet Directory client tools, including LDAP command-line tools, the Oracle Internet Directory SDK, and Oracle Directory Manager.
- Oracle Internet Directory server components, including the directory server, the directory replication server, the directory integration server, and various tools for starting and stopping them.

Oracle Database includes the Oracle Internet Directory client tools, but not the Oracle Internet Directory server components. To install the Oracle Internet Directory server components, see Oracle Identity Management documentation on Oracle Help Center at:

<http://docs.oracle.com/en/database/database.html>

 **See Also:**

- *Oracle Database Security Guide*
- *Oracle Database Enterprise User Security Administrator's Guide*
- *Oracle Label Security Administrator's Guide*
- Oracle Help Center topics on database security:

[http://docs.oracle.com/database/121/nav/portal\\_25.htm](http://docs.oracle.com/database/121/nav/portal_25.htm)

**How do I use Oracle Database to manage my XML data?**

Use Oracle XML DB, which is installed as part of Oracle Database. Oracle XML DB enables you to efficiently store, generate, retrieve, query, and manage XML data on



your site. Oracle XML DB provides all the advantages of a relational database, for example, allowing you to control the referential integrity of XML data with constraints and triggers. It works well with large amounts of XML data by storing it in a parsed, relational form, which improves access performance.

Oracle XML DB supports XML Type, which is a native data type for XML data, for which you can choose various storage options depending on your needs. In addition, Oracle XML DB supports XML Schema processing, structured and unstructured storage, a content repository that you can access by using common protocols (FTP, HTTP(S), and WebDAV), and SQL/XML, which is a standard for SQL with XML. For Oracle Database 11g Release 1 (11.1), Oracle XML DB introduced support for the XQuery language for querying, transforming, and constructing XML; the ability for users to define their own metadata for schema-based XML; a set of new SQL functions for DML operations on XML data; and more.

You can use Oracle XML DB with Oracle XML Developer's Kit (XDK) to build applications that run on either Oracle Database or Oracle WebLogic Server.

 **See Also:**

- *Oracle XML DB Developer's Guide*
- *Oracle XML Developer's Kit Programmer's Guide*

### **Does Oracle Database provide OLAP tools so that I can analyze data such as trends and time series in my database?**

Yes, Oracle OLAP is available as part of an Oracle Database Enterprise Edition installation. Oracle OLAP provides optimal support for database environments that must meet OLAP requirements.

 **See Also:**

- *Oracle OLAP User's Guide*
- *Oracle OLAP DML Reference*
- *Oracle OLAP Java API Reference*

### **Does Oracle Database provide data mining tools that I can use to discover hidden meaning in my data and predict likely outcomes based on my data?**

Yes, you must have an Oracle Enterprise Edition license to use Oracle Data Mining tools. Oracle Data Mining is an option of the Enterprise Edition, as described in Table 6–2, in the Select Database Edition row.

With the Oracle Data Mining option, you can create and execute predictive and descriptive data mining models that use a variety of algorithms.

Use the following method to install Oracle Data Mining:

1. When you run Oracle Universal Installer, select the **Enterprise Edition** installation type.

2. In the Select Database Configuration screen, select the **General Purpose/Transaction Processing** configuration.

 **See Also:**

The following manuals for information about Oracle Data Mining:

- *Oracle Data Mining Concepts*
- *Oracle Data Mining User's Guide*
- *Oracle Database PL/SQL Packages and Types Reference* (search for Data Mining)

**Example G-4 How do I perform backup and recovery operations for Oracle Database?**

Use Oracle Database Recovery Manager (RMAN), which is a backup and recovery tool integrated into Oracle Database. This tool satisfies the pressing demands of high-performance, manageable backup, and recovery. Recovery Manager is native to the database server, automatically tracks database structure changes, and optimizes operations accordingly. In addition, Recovery Manager is integrated with leading tape media management products, so that Oracle database backups can be integrated with your existing networked data protection infrastructure.

 **See Also:**

- *Oracle Database Backup and Recovery User's Guide*
- *Oracle Database Backup and Recovery Reference*

**Example G-5 Is Oracle Workflow included with Oracle Database?**

Starting with Oracle Database 11g, Oracle Workflow is no longer released with the database. Oracle Workflow is available with the Oracle E-Business Suite releases.

 **See Also:**

Oracle Workflow statement of direction: <http://www.oracle.com/technetwork/middleware/ias/workflow-sod-089843.html>

**Example G-6 Is there a migration plan for customers that have built solutions using Oracle Workflow?**

Starting January 2006, customers are encouraged to re-create and implement workflows using Oracle SOA Suite. Refer to the following technical migration guide for detailed recommendations about migrating Oracle Workflow processes to Oracle SOA Suite (formerly known as Oracle BPEL Process Manager) at <http://www.oracle.com/technetwork/middleware/ias/owf2bpel-132189.pdf>

 **See Also:**

Oracle Workflow statement of direction: <http://www.oracle.com/technetwork/middleware/ias/workflow-sod-089843.html>

## Installing Oracle Database with Oracle Applications

The following are the frequently asked questions about installing Oracle Database with Oracle applications:

- [How do I install my Oracle applications with Oracle Database?](#)
- [How can I create web applications that communicate with Oracle Database?](#)
- [Which web server can my Oracle applications use?](#)
- [How can I migrate my non-Oracle applications to Oracle?](#)

### **How do I install my Oracle applications with Oracle Database?**

In most cases, install Oracle Database itself, then install the Oracle application. The Oracle Universal Installer for that application prompts you for the connection information. Check the application documentation requirements.

If you must implement your applications with Oracle Real Applications Clusters databases, see *Oracle Real Application Clusters Installation Guide* and *Oracle Grid Infrastructure Installation Guide* for your platform.

### **How can I create web applications that communicate with Oracle Database?**

Install Oracle Application Express and a web server. Use Oracle Universal Installer to install Oracle Database. Oracle Application Express is automatically installed, when you install Oracle database.

 **See Also:**

*Oracle Application Express Installation Guide*

### **Which web server can my Oracle applications use?**

Install Oracle HTTP Server, which ships on a separate media, or use the XML DB HTTP Protocol Server and the embedded PL/SQL Gateway that installs with Oracle Database 12c.

### **How can I migrate my non-Oracle applications to Oracle?**

Use Oracle SQL Developer to migrate your non-Oracle applications to Oracle. Oracle SQL Developer software and documentation is available on Oracle Help Center at:

<http://docs.oracle.com/en/database/database.html?tab=2#sqldev>

# Installing Oracle Database Heterogeneous Connectivity Tools (Gateways)

Learn how to access and install Gateway products.

[How can I access my Oracle applications access data in a non-Oracle database system?](#)

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

You can use Oracle Database Gateway as the connectivity tool to enable Oracle applications to access data in non-Oracle databases. The following are the functions of Oracle Database Gateway:

- Integrates a non-Oracle database into your Oracle Database environment.
- Enables Oracle PL/SQL applications to integrate with APPC-enabled transactions, or access messages in IBM Websphere MQ.

You can install the Gateway product on a computer independent of the Oracle application, Oracle database, and non-Oracle database.

For example, suppose you have the following scenario:

- Oracle Database is installed on a Linux computer.
- The Oracle application is installed on a Microsoft Windows computer and accesses data from the Oracle database on the Linux computer.
- The Oracle application needs to join data in a DB2 database on Solaris Operating System and an Oracle Database on Linux.

You have the option of installing Oracle Database Gateway for DRDA on the Solaris computer where DB2 is running, on Linux where Oracle is running, or on a third computer.

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

**Table G-1 Oracle Gateway Products**

Non-Oracle Database	Oracle Gateway Products and Documentation
IBM DB2 Universal Database (UDB)	Oracle Database Gateway for DRDA. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for DRDA User's Guide</i>
IBM DB2 z/OS	Oracle Database Gateway for DRDA. Use <i>Oracle Database Gateway for APPC Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for DRDA User's Guide</i>
IBM DB2/400	Oracle Database Gateway for DRDA. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for DRDA User's Guide</i>
WebSphere MQ	Oracle Database Gateway for WebSphere MQ. <i>Oracle Database Gateway for WebSphere MQ Installation and User's Guide</i>

**Table G-1 (Cont.) Oracle Gateway Products**

Non-Oracle Database	Oracle Gateway Products and Documentation
CICS/TS IMS/TM	Oracle Database Gateway for APPC. Use <i>Oracle Database Gateway for APPC Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for APPC User's Guide</i>
SQL Server	Oracle Database Gateway for SQL Server. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for SQL Server User's Guide</i>
Sybase Adaptive Server	Oracle Database Gateway for Sybase. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for Sybase User's Guide</i>
Teradata	Oracle Database Gateway for Teradata. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for Teradata User's Guide</i>
Informix Server	Oracle Database Gateway for Informix. Use <i>Oracle Database Gateway Installation and Configuration Guide for Microsoft Windows</i> and <i>Oracle Database Gateway for Informix User's Guide</i>

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