

Dell™ PowerEdge™ Systems  
Oracle® Database on  
Microsoft® Windows  
Server® x64

# Database Setup and Installation Guide

Version 4.4



# Notes and Cautions



**NOTE:** A NOTE indicates important information that helps you make better use of your computer.



**CAUTION:** A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.

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**March 2010      Rev. A02**

# Contents

1	Overview . . . . .	5
	<b>Required Documentation for Installing Oracle Database 10g R2</b> . . . . .	5
	<b>Terminology Used in This Document</b> . . . . .	6
	<b>Getting Help</b> . . . . .	6
	Dell Support. . . . .	6
	Oracle Support . . . . .	6
2	Before You Begin. . . . .	7
	<b>Choosing the Correct Oracle Installation Media</b> . . . . .	7
3	Installing Oracle <sup>®</sup> RAC 10g R2 Using OCFS . . . . .	9
	<b>Installing Oracle Clusterware</b> . . . . .	9
	Applying Oracle Patch 7320726 for Windows Server 2008 . . . . .	13
	<b>Installing Oracle Database 10g R2 With RAC</b> . . . . .	13
	<b>Installing Oracle 10g R2 Patchset</b> . . . . .	15
	Installing Patchset 10.2.0.4 for Oracle 10g Clusterware. . . . .	15
	Installing Patchset 10.2.0.4 for Oracle 10g Database . . . . .	16
	Downloading the Latest Oracle Patches. . . . .	17

	<b>Configuring the Listener . . . . .</b>	<b>17</b>
	<b>Creating the Seed Database . . . . .</b>	<b>18</b>
<b>4</b>	<b>Installing Oracle RAC 10g R2 Using ASM . . . . .</b>	<b>21</b>
	<b>Installing Oracle Clusterware . . . . .</b>	<b>21</b>
	Applying Oracle Patch 7320726 for Windows Server 2008. . . . .	24
	<b>Installing Oracle 10g Database . . . . .</b>	<b>25</b>
	<b>Installing Oracle 10g R2 Patchset . . . . .</b>	<b>26</b>
	Installing Patchset 10.2.0.4 for Oracle 10g Clusterware. . . . .	26
	Installing Patchset 10.2.0.4 for Oracle 10g Database . . . . .	27
	<b>Configuring the Listener . . . . .</b>	<b>28</b>
	<b>Creating the Seed Database . . . . .</b>	<b>29</b>
<b>5</b>	<b>Adding a New Node to an Existing Oracle 10g RAC Cluster . . . . .</b>	<b>33</b>
	<b>Preparing the Node to be Added to a Cluster . . . . .</b>	<b>33</b>
	<b>Adding Nodes at the Oracle Clusterware Layer. . . . .</b>	<b>34</b>
	<b>Adding Nodes at the Oracle RAC Database Layer . . . . .</b>	<b>35</b>
	<b>Adding Database Instances to New Nodes . . . . .</b>	<b>36</b>

# Overview

This document applies to:

- Oracle® Database 10g R2 Enterprise Edition on Microsoft® Windows Server® 2003 R2 SP2 Enterprise or Standard x64 Edition or Windows Server 2008 SP2 Enterprise or Standard x64 Edition.
- Oracle Database 10g R2 Standard Edition on Microsoft Windows Server 2003 R2 SP2 Standard x64 Edition or Windows Server 2008 SP2 Standard x64 Edition.

## Required Documentation for Installing Oracle Database 10g R2

The modules listed below are the required documentation for installing the Dell™ | Oracle database:

- *Oracle Database on Microsoft Windows Server x64 Operating System and Hardware Installation Guide* — Describes the required minimum hardware and software versions, how to install and configure the operating system, how to verify the hardware and software configurations, and how to obtain open source files.
- *Oracle Database on Microsoft Windows Server x64 Storage and Network Guide* — Describes how to install and configure the storage and network solutions.
- *Oracle Database on Microsoft Windows Server x64 Database Setup and Installation Guide* — Describes how to install and configure the Oracle Database.
- *Oracle Database on Microsoft Windows Server x64 Troubleshooting Guide* — Describes how to troubleshoot and resolve errors encountered during the installation procedures described in the previous modules.



**NOTE:** All modules provide information about receiving technical assistance from Dell.

# Terminology Used in This Document

This document uses the terms logical unit number (LUN) and virtual disk. These terms are synonymous and can be used interchangeably. The term LUN is commonly used in a Dell/EMC Fibre Channel storage system environment and virtual disk is commonly used in a direct-attached SAS (Dell™ PowerVault™ MD3000/MD3000i and PowerVault MD3000/MD3000i with PowerVault MD1000 expansion) storage environment.

## Getting Help

### Dell Support

- For detailed information about using your system, see the documentation that came with your system components.
- For whitepapers, Dell-supported configurations, and general information, see [dell.com/oracle](http://dell.com/oracle).
- For Dell technical support for your hardware and operating system software and to download the latest updates for your system, see [support.dell.com](http://support.dell.com).
- For information about contacting Dell, see the *Oracle Database on Microsoft Windows Server x64 – Operating System and Hardware Installation Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
- For more information about Dell Enterprise Training and Certification, see [dell.com/training](http://dell.com/training). Dell may not offer this training service in all locations.

### Oracle Support

- For information about Oracle software and application Clusterware training and contacting Oracle, see [oracle.com](http://oracle.com) or your Oracle documentation.
- For information about technical support, downloads, and other technical information, see [metalink.oracle.com](http://metalink.oracle.com).

# 2

## Before You Begin

This section provides information on basic installation requirements for Oracle<sup>®</sup> Real Application Cluster (RAC) 10g R2.

### Choosing the Correct Oracle Installation Media

To choose the correct Oracle installation media version for your Microsoft<sup>®</sup> Windows Server<sup>®</sup> operating systems, see Table 2-1.

**Table 2-1. Supported Versions of Clusterware/ Database/ Patchset**


<b>Operating System</b>	<b>Oracle Clusterware version</b>	<b>Oracle Database version</b>	<b>Patchset version</b>
Windows Server 2008	10.2.0.4	10.2.0.4	Not Applicable
Windows Server 2003	10.2.0.1	10.2.0.1	10.2.0.4






# Installing Oracle<sup>®</sup> RAC 10g R2 Using OCFS

This section applies only to Oracle<sup>®</sup> Enterprise Edition. This section describes the procedures to install Oracle Real Application Cluster (RAC) 10g R2 using Oracle Cluster File System (OCFS).

 **NOTE:** If you want to install Oracle using Automatic Storage Management (ASM), ignore the following steps and follow the procedures given under "Installing Oracle RAC 10g R2 Using ASM" on page 21.

## Installing Oracle Clusterware


- 1 On node 1, insert the appropriate Oracle Clusterware installation media for your operating system as specified in Table 2-1 into your optical drive.  
The Oracle Universal Installer (OUI) starts and the **Welcome** window is displayed. If the **Welcome** window is not displayed:
  - a Click **Start** and select **Run**.
  - b In the **Run** field, type the following text and click **OK**:  
`%CD-ROM drive%:\autorun\autorun.exe`  
where `%CD-ROM drive%` is the drive letter of your optical drive.
- 2 In the **Oracle Clusterware - Autorun** window, click **Install/Deinstall Products**.  
The Oracle Universal Installer starts (OUI) and the **Welcome** window is displayed.
- 3 Click **Next**.
- 4 In the **Specify Home Details** window, accept the default settings and click **Next**.

 **NOTE:** Record the OraCR10g\_home (CRS Home) path. You require this information later during installation.

- 5 In the **Product Specification Prerequisite Checks** window:
  - *For Windows Server 2003:* Ensure that the installation program completes all the checks successfully and then click **Next**.
  - *For Windows Server 2008:* The **Product Specification Prerequisite Check** fails for the OCFS and Orafence Driver's Signature.

To continue with the installation, select the **Checking OCFS & Orafence Driver's Signature** check box when the installation performs the prerequisite checks. The field label changes to **User Verified**.

To resolve this issue, apply Oracle patch 7320726 immediately after you complete the Oracle Clusterware installation and before you install the database binaries. For more information, see "Applying Oracle Patch 7320726 for Windows Server 2008" on page 13.
- 6 In the **Specify Cluster Configuration** window, enter the following:
  - a An alternate cluster name (if required).
  - b The public and private network host names for both cluster nodes. Click **Add** to specify additional nodes.

 **NOTE:** Ensure that the network host names do not include a domain name extension.
  - c In the **Add a new node to the existing cluster** window, enter the public, private, and virtual host name, and click **OK**.
- 7 Click **Next**.

The **Specify Network Interface Usage** window with a list of cluster-wide network interfaces is displayed.
- 8 To change the **Interface Type**:
  - a Select the **Interface Name** and click **Edit**.
  - b Select one of the following options:
    - **Public** — to make the interface a public interface
    - **Private** — to make the interface a private interface
    - **Do not use** — for all other interfaces.
  - c Click **OK**.
- 9 In the **Specify Network Interface Usage** window, click **Next**.

- 10** In the **Cluster Configuration Storage** window, perform the following steps for the Oracle Cluster Registry (OCR) disk:
  - a** Locate the two 300 MB partitions that you created. For more information on the procedure, see *Preparing the OCR and Voting Disks for Clusterware in Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the first partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Place OCR (Primary) on this partition** and click **OK**.
  - d** Select the second partition and click **Edit**.
  - e** In the **Specify Disk Configuration** window, select **Place OCR (Mirror) on this partition** and click **OK**.
- 11** In the **Cluster Configuration Storage** window, perform the following steps for the voting disk:
  - a** Locate the three 250 MB partitions that you created. For more information on the procedure, see *Preparing the OCR and Voting Disks for Clusterware in Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the first partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Place Voting Disk on this partition** and click **OK**.
  - d** Repeat step b and step c on the remaining voting disk partitions.
- 12** In the **Cluster Configuration Storage** window, perform the following steps for the database:
  - a** Locate the partition that you created. For more information on the procedure, see *Preparing the Database Disk and Flash Recovery Area for Database Storage With OCFS in Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Format partition with CFS**.

- d** Ensure that you select **Use partition for data storage**.
  - e** Use the drop-down menu of the **Assign Drive Letter** option to assign a drive letter to the partition.
  - f** Click **OK**.
- 13** In the **Cluster Configuration Storage** window, perform the following steps for flash recovery:
- a** Locate the partition you created. For more information, see *Preparing the Database Disk and Flash Recovery Area for Database Storage With OCFS in Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Format partition with CFS**.
  - d** Ensure that you select the **Use partition for data storage** option.
  - e** Use the drop-down menu of the **Assign Drive Letter** option to assign a drive letter to the partition.
  - f** Click **OK**.
- 14** In the **Cluster Configuration Storage** window, click **Next**.
- 15** Ignore the warning messages and click **OK**.
- 16** In the **Summary** window, click **Install** to start the installation procedure. The **Install** window displays an installation progression bar. The **Configuration Assistant** window is displayed and the OUI runs a series of configuration tools. The **End of Installation** window is displayed.



**NOTE:** If a failure occurs in the **Configuration Assistant** window:

- a** In the error window, click **OK**.
- b** In the **Configuration Assistant** window, click **Next**.
- c** Ignore the warning message and click **OK**.
- d** Click **Exit** to finish the OUI session.
- e** In the **Exit** window, click **Yes**.

For more information, see the *Oracle Database on Microsoft Windows Server x64 – Troubleshooting Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).

For information on how to install Oracle using ASM, see "Installing Oracle RAC 10g R2 Using ASM" on page 21.

## Applying Oracle Patch 7320726 for Windows Server 2008



**NOTE:** This section is applicable only if your Oracle 10g database installation is on Windows Server 2008. Install this patch before you install the database binaries.

The Oracle patch 7320726 resolves the expired digital signatures in the `ocfs.sys` and `orafencedrv.sys` files.

You can download the patch containing updated drivers from [metlink.oracle.com](http://metlink.oracle.com). To apply Oracle patch 7320726:

- 1 Stop all Oracle services.
- 2 Navigate to the `\windows\system32\driver` directory and rename the `ocfs.sys` and `orafencedrv.sys` files.
- 3 Copy the new `orafencedrv.sys` and `ocfs.sys` files from the patch staging area.
- 4 Reboot your system.
- 5 Repeat step 1 to step 4 on all nodes.


After you have updated and rebooted all the nodes, you can proceed with the database installation.


## Installing Oracle Database 10g R2 With RAC

- 1 On node 1, insert the appropriate Oracle Clusterware installation media for your operating system as specified in Table 2-1 into your optical drive. The OUI starts and the **Welcome** window is displayed. If the **Welcome** window is not displayed:
  - a Click **Start** and select **Run**.
  - b In the **Run** field, type the following text and click **OK**:  
`%CD-ROM drive%:\autorun\autorun.exe`  
where `%CD-ROM drive%` is the drive letter of your optical drive.

- 2 In the **Oracle Database 10g - Autorun** window, click **Install/Deinstall Products**. The OUI starts and the **Welcome** window is displayed.
- 3 Click **Next**.
- 4 In the **Select Installation Type** window, select **Enterprise Edition** and click **Next**.
- 5 In the **Specify Home Details** window, verify the following details under **Destination**:
  - The **Name** field displays the Oracle database home name as **OraDb10g\_home1**.
  - The **Path** field displays the complete Oracle home path as **%SystemDrive%\oracle\product\10.2.0\db\_1** where *%SystemDrive%* is your local drive.

By default, the OUI selects one of the CFS shared drives to copy the database files. To change the drive to the *%SystemDrive%*, change the drive letter in the **Path** field.

 **NOTE:** Record the Oracle home path. You require this information later during the installation process.

 **NOTE:** The Oracle home path must be different from the Oracle home path that you selected in step 4 of the Oracle Clusterware installation procedure. You cannot install the Oracle 10g Enterprise x64 Edition with RAC and Clusterware in the same home directory.
- 6 Click **Next**.
- 7 In the **Specify Hardware Cluster Installation Mode** window, select **Select All** and click **Next**.
- 8 In the **Product Specification Prerequisite Checks** window, ensure that the installation program completes all the checks successfully and then click **Next**.
- 9 In the **Select Configuration Option** window, select **Install Database Software Only** and click **Next**.
- 10 In the **Summary** window, click **Install**.

- 11 After the installation is complete, the **End of Installation** window is displayed. Complete the procedures in the **End of Installation** window and then click **Exit**.



**NOTE:** You must complete the steps in the **End of Installation** window before you exit.

- 12 In the **Exit** Window, click **Yes**.

## Installing Oracle 10g R2 Patchset



**NOTE:** This section is applicable only if you are installing Oracle 10g database on a system running Windows Server 2003.

- 1 Ensure that you install only the 10.2.0.1 Clusterware and 10.2.0.1 database binaries on your system and that you do not create the seed database.
- 2 Download the patchset 10.2.0.4 from [metalink.oracle.com](http://metalink.oracle.com).
- 3 Unzip the patchset to *%SystemDrive%* which is your local drive.

### Installing Patchset 10.2.0.4 for Oracle 10g Clusterware

#### Before You Begin

Before you install patchset 10.2.0.4 for Oracle 10g Clusterware on your system, perform the following steps:


- 1 Stop `nodeapps` on all the nodes. Enter the following text in command prompt:

```
%SystemDrive%\%CRS_HOME%\bin> srvctl stop nodeapps  
-n <node name>
```


where *%SystemDrive%* is the drive on which you configured the Oracle home and *%CRS\_HOME%* is the home directory that you created. For more information on creating the home directory, see "Installing Oracle Clusterware" on page 9.

- 2 Select **Start**→**Programs**→**Administrator Tools**→**Services** to start **Programs Administrator Tools Services**.
- 3 Locate all Oracle services and stop them on both nodes.

## Installing the Patchset


 **NOTE:** You must install the patchset from the node where you installed the RAC 10g R2 software. If you are not running the OUI from the same node, exit and install the patchset from the node where you installed the RAC 10g R2 software.

- 1 Start the OUI located in the patchset folder. For example:  
`%SystemDrive%\Oracle_patch\setup.exe`  
where *%SystemDrive%* is the drive on which you unzipped the Oracle patchset.
- 2 In the **Welcome** window, click **Next**.
- 3 In the **Specify home details** window, select **OraCR10g\_home** from the drop-down menu and click **Next**.
- 4 In the **Specify Hardware Cluster Installation Mode** window, click **Next**.
- 5 In the **Product-Specific Prerequisite Checks** window, click **Next**.
- 6 In the **Summary** window, click **Install**.
- 7 In the **End of Installation** window, perform all the steps that the **Summary** tab displays.


 **NOTE:** Do not perform the step that instructs you to stop the Oracle services. You must stop the Oracle services before you begin installing the patchset. For more information, see "Before You Begin" on page 15.

- 8 In the **End of Installation** window, click **Exit**.
- 9 Click **Yes** to exit from the OUI.


## Installing Patchset 10.2.0.4 for Oracle 10g Database

 **NOTE:** Before you install the patchset, ensure that you start all the Oracle services. Complete the following procedures before you create a listener and a seed database.

### Installing the Patchset

 **NOTE:** Install the patchset from the node where you installed the RAC 10g R2 software. If you are not running the OUI from the same node, exit and install the patchset from where you installed the RAC 10g R2 software.




- 1 Start the OUI located in the patchset folder. For example:  
`%SystemDrive%\Oracle_patch\setup.exe`  
where `%SystemDrive%` is the drive on which you unzipped the Oracle patchset.
- 2 In the **Welcome** window, click **Next**.
- 3 In the **Specify Home Details** window, select `OraDB10g_home1` from the drop-down menu and click **Next**.
- 4 In the **Specify Hardware Cluster Installation Mode** window, click **Next**.
- 5 In the **Product-Specific Prerequisite Checks** window, click **Next**.
- 6 In the **Oracle Configuration Manager Registration** window, click **Next**.
- 7 In the **Summary** window, click **Install**.
- 8 In the **End of Installation** window, perform all the steps that the **Summary** tab displays.
  -  **NOTE:** Do not perform the step that instructs you to stop the Oracle services. You must stop the Oracle services before you begin installing the patchset. For more information, see "Before You Begin" on page 15.
- 9 In the **End of Installation** window, click **Exit**.
- 10 Click **Yes** to exit from the OUI.

## Downloading the Latest Oracle Patches

Oracle may provide additional patches that were not included when you first downloaded the patchset. You can download additional patches from [metalink.oracle.com](http://metalink.oracle.com).

## Configuring the Listener

This section describes the steps to configure the listener. You need to configure the listener to connect to the database from a remote client.

 **NOTE:** You must install the path before you follow the procedure in this section.

Perform the following steps on node 1:

- 1 Click **Start**, select **Run**, and type `netca` and click **OK**.
- 2 In the **Real Application Clusters, Configuration** window, select **Cluster configuration** and click **Next**.

- 3 In the **Real Application Clusters, Active Nodes** window, select **Select all nodes** and click **Next**.
- 4 In the **Welcome** window, select **Listener Configuration** and click **Next**.
- 5 In the **Listener Configuration** window perform the following steps:
  - a In the **Listener** window, select **Add** and click **Next**.
  - b In the **Listener Name** window, accept the default value in the **Listener name** field and click **Next**.
  - c In the **Select Protocols** window, select **TCP** in the **Selected protocols** field and click **Next**.
  - d In the **TCP/IP Protocol** window, select **Use the standard port number of 1521** and click **Next**.
  - e In the **More Listeners** window, select **No** and click **Next**.
- 6 In the **Listener Configuration Done** window, click **Next**.
- 7 In the **Welcome** window, click **Finish**.

## Creating the Seed Database


This section provides procedures to create the seed database using OCFS and and to verify the seed database.



**NOTE:** You must install the required patches as described in the earlier sections before you follow the procedures in this section.


Perform the following steps to create the seed database using OCFS:

- 1 Click **Start** and select **Run** on node 1.
- 2 In the **Run** field, type `dbca` and click **OK**.  
The **Database Configuration Assistant** starts.
- 3 In the **Welcome** window, select **Oracle Real Application Clusters database** and click **Next**.
- 4 In the **Operations** window, click **Create a Database** and click **Next**.
- 5 In the **Node Selection** window, click **Select All** and click **Next**.
- 6 In the **Database Templates** window, click **Custom Database** and click **Next**.

- 7 In the **Database Identification** window, enter a name such as `racddb` in the **Global Database Name** field and click **Next**.
- 8 In the **Management Options** window, accept the default selections and click **Next**.
- 9 In the **Database Credentials** window, click **Use the Same Password for All Accounts**, type and confirm a new password in the appropriate fields, and click **Next**.  
 **NOTE:** Record your new password. You require this information later during database administration.
- 10 In the **Storage Options** window, select **Cluster File System** and click **Next**.
- 11 In the **Database File Locations** window, you need to select the location for storing database files. Perform the following steps:
  - a Select **Use Common Location for All Database Files**.
  - b Click **Browse**.
  - c In the **Directory Browse** window, select the CFS drive that you created, from the drop-down menu. For more information, see sub-step e of step 12 of "Installing Oracle Clusterware" on page 9.
  - d Click **OK**.
- 12 Click **Next**.
- 13 In the **Recovery Configuration** window, perform the following steps:
  - a Select **Specify Flash Recovery Area**.
  - b Click **Browse**.
  - c In the **Directory Browse** window, select the CFS drive that you created from the drop-down menu. For more information, see sub-step e of step 13 of "Installing Oracle Clusterware" on page 9.
  - d Click **OK**.
  - e In the **Flash Recovery Area Size** text box, enter the total amount of space that you created for the Flash Recovery Area. For more information, see *Preparing the Database Disk and Flash Recovery Area for Database Storage With OCFS in Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
- 14 Select **Enable Archiving**.

- 15 Click **Edit Archive Mode Parameters**.
  - a In the **Edit Archive Mode Parameters** window, ensure that the path listed under the **Archive Log Destinations** is as follows: *X:/*  
where *X* is the CFS drive letter that you created for the Flash Recovery Area. For more information, see *Preparing the Database Disk and Flash Recovery Area for Database Storage With OCFS* in *Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b Click **OK**.
- 16 Click **Next**.
- 17 In the **Database Content** window, accept the default values and click **Next**.
- 18 In the **Database Services** window, click **Next**.
- 19 In the **Initialization Parameters** window, click **Next**.
- 20 In the **Database Storage** window, click **Next**.
- 21 In the **Creation Options** window, accept the default values and click **Finish**.
- 22 In the **Summary** window, click **OK**.

The **Database Configuration Assistant** window is displayed, and the Oracle software creates the database.

 **NOTE:** The database creation may take several minutes to complete.
- 23 In the **Database Configuration Assistant** window, click **Yes**.

When the database configuration is complete, the **Database Configuration Assistant** window provides database configuration information.
- 24 Record the information in the **Database Configuration Assistant** window for future database administration.
- 25 Click **Exit**. The **Start Cluster Database** window is displayed and the cluster database starts.

# Adding a New Node to an Existing Oracle 10g RAC Cluster

This section describes how to add nodes and instances to Oracle® Real Application Cluster (RAC) databases on Microsoft® Windows Server® x64 operating systems.

## Preparing the Node to be Added to a Cluster

Perform the following steps on the node(s) that you want to add to an existing cluster:

- 1 Install and configure the operating system using the deployment media.
- 2 Configure the networking and fiber channel storage subsystem.

Ensure that you can execute the following command from *each* node of your cluster:

```
NET USE \\host_name\C$
```

Where *host\_name* is the public network name of the new node.

If you have the required administrative privileges on each node, the operating system displays the following message:

```
Command completed successfully.
```



**NOTE:** If you are using Automatic Storage Management (ASM), then ensure that the new nodes can access the ASM disks with the same permissions as the existing nodes.



**NOTE:** If you are using Oracle Cluster File System (OCFS), then ensure that the new nodes can access the cluster file systems in the same way that the other nodes access them.

Now the node(s) is ready to be added to an existing cluster.

## Adding Nodes at the Oracle Clusterware Layer

- 1 On one of the *existing* nodes, navigate to the CRS home\oui\bin directory. Run the `addNode.bat` script to start the Oracle Universal Installer (OUI).
- 2 The OUI runs in the add node mode and displays the **OUI Welcome** window.
- 3 Click **Next**. The **Specify Cluster Nodes for Node Addition** window is displayed.

The upper table on the **Specify Cluster Nodes for Node Addition** window displays the existing nodes associated with the CRS home from which you launched the OUI.

- 4 Enter the public and private node names of the new nodes in the lower table.  
If all the checks succeed, then the OUI displays the **Node Addition Summary** window.
- 5 Click **Next**. The OUI displays the **Cluster Node Addition Progress** window.
- 6 On completion, click **Exit** to end the OUI session.

- 7 After the OUI displays the **End of Node Addition** window, click **Exit** to end the OUI session.

- 8 Execute the following command to identify the node names and node numbers that are currently in use:

```
CRS home\bin\olsnodes -n
```

- 9 Execute the `crssetup.exe` command using the next available node names and node numbers to add CRS information for the new nodes. For example:

```
crssetup.exe add -nn publicnode3,3 -pn pvtnode3,3  
-vn vipnode3,3
```

- 10 Execute the `racgons` utility from the `bin` subdirectory of the CRS home to configure the Oracle Notification Services (ONS) port number as follows:

```
racgons add_config new_node_name:4948
```

After you complete the procedures in this section and add nodes at the Oracle Clusterware layer, you can successfully extend the CRS home from your existing CRS home to the new nodes.

## Adding Nodes at the Oracle RAC Database Layer

- 1 Run the `addNode.bat` script from the `%ORACLE_HOME%\oui\bin` directory. This starts the OUI in the add node mode and displays the OUI **Welcome** window.
- 2 Click **Next** on the **Welcome** window. The **Specify Cluster Nodes for Node Addition** window is displayed.

The **Specify Cluster Nodes for Node Addition** window has a table that displays the existing nodes associated with the Oracle home from which you launched the OUI. A node selection table is displayed on the bottom of this window showing the nodes that are available for addition.

- 3 Select the nodes that you want to add and click **Next**.  
If all the checks succeed, then the **Node Addition Summary** window is displayed.
- 4 Click **Finish**. The **Cluster Node Addition Progress** window is displayed.
- 5 After the **End of Node Addition** window is displayed, click **Exit** to end the OUI session.
- 6 Run the `VIPCA` utility from the `bin` subdirectory of the Oracle home using the `-nodelist` option with the following syntax that identifies the complete set of nodes that are now part of your RAC database beginning with `Node1` and ending with `NodeN`:

```
vipca -nodelist Node1,Node2,Node3, . . .NodeN
```

- 7 Add a listener to the new node only by running the **Net Configuration Assistant (NetCA)**.

After you complete the steps, the new nodes are defined in the cluster database layer. You can now add new database instances to the new nodes.

## Adding Database Instances to New Nodes

To add database instances to each new node, perform the following steps:

- 1 Choose **Start**→ **Programs**→ **Oracle - HOME\_NAME**→ **Configuration and Migration Tools**→ **Database Configuration Assistant**.

The **Welcome** window for RAC is displayed.

- 2 Click **Help** on any DBCA window for additional information.
- 3 Select **Real Application Clusters database** and click **Next**. The DBCA displays the **Operations** window.
- 4 Select **Instance Management** and click **Next**. The DBCA displays the **Instance Management** window.
- 5 Select **Add Instance** and click **Next**. The DBCA displays the **List of Cluster Databases** window that shows the databases and their current status, such as **Active** or **Inactive**.
- 6 Select the active RAC database to which you want to add an instance, in the **List of Cluster Databases** window.
- 7 Click **Next** to add a new instance. The DBCA displays the **Adding an Instance** window.
- 8 In the **Adding an Instance** window, enter the instance name in the appropriate field.
- 9 Select the new node name from the list and click **Next**. The DBCA displays the **Services** window.
- 10 Enter the services information for the instance on the new node and click **Next**. The DBCA displays the **Instance Storage** window.
- 11 Click **Finish**. The DBCA displays a **Summary** dialog.
- 12 Review the information on the **Summary** dialog and click **OK**.  
The DBCA displays a progress dialog that shows the DBCA performing the instance addition operation. When the DBCA completes the instance addition operation, the DBCA displays a dialog that asks you if you want to perform another operation.
- 13 Click **No** and exit the DBCA, or click **Yes** to perform another operation.



# Installing Oracle RAC 10g R2 Using ASM

This section applies to both Oracle<sup>®</sup> Enterprise Edition and Standard Edition. This section describes the procedures to install Oracle Real Application Cluster (RAC) 10g R2 using Automatic Storage Management (ASM).



**NOTE:** If you want to install Oracle using OCFS, ignore the following steps and follow the procedures given under "Installing Oracle<sup>®</sup> RAC 10g R2 Using OCFS" on page 9.

## Installing Oracle Clusterware

- 1 On node 1, insert the appropriate Oracle Clusterware installation media for your operating system as specified in Table 2-1 into your optical drive. The Oracle Universal Installer (OUI) starts and the **Welcome** window is displayed.

If the **Welcome** window is not displayed:

- a Click **Start** and select **Run**.
- b In the **Run** field, type the following and click **OK**:  
`%CD-ROM drive%\autorun\autorun.exe`  
where `%CD-ROM drive%` is the drive letter of your optical drive.

- 2 In the **Oracle Clusterware** window, click **Install/Deinstall Products**.
- 3 In the **Welcome** window, click **Next**.
- 4 In the **Specify Home Details** window, accept the default settings and click **Next**.



**NOTE:** Record the OraCR10g\_home (CRS Home) path. You require this information later.

- 5 In the **Product Specification Prerequisite Checks** window:

- *For Windows Server 2003:* Ensure that the installation program completes all the checks successfully and then click **Next**.
- *For Windows Server 2008:* The **Product Specification Prerequisite Check** fails for the OCFS and Orafence Driver's Signature.

To continue with the installation, select the **Checking OCFS & Orafence Driver's Signature** check box when the installation performs the prerequisite checks. This changes the field label to **User Verified**.

To resolve this issue, apply Oracle patch 7320726 immediately after you complete the Oracle Clusterware installation and before you install the database binaries. For more information on applying Oracle patch 7320726, see "Applying Oracle Patch 7320726 for Windows Server 2008" on page 24.

- 6 In the **Specify Cluster Configuration** window, perform the following steps:
  - a Verify the public, private, and virtual host names for the primary node.
  - b If you want to change these values, click **Edit**, enter the required values, and click **OK**.
  - c Click **Add**.
  - d Enter the public, private, and virtual host names for the second node, and click **OK**.

- 7 Click **Next**.

The **Specify Network Interface Usage** window is displayed, which displays a list of cluster-wide network interfaces.

- 8 To change the **Interface Type**:
  - a Select the **Interface Name** and click **Edit**.
  - b Select one of the following options:
    - **Public** — to make the interface a public interface
    - **Private** — to make the interface a private interface
    - **Do not use** — for all other interfaces.
  - c Click **OK**.
- 9 Click **Next**.

- 10** In the **Cluster Configuration Storage** window, perform the following steps for the Oracle Cluster Registry (OCR) disk:
  - a** Locate the two 300 MB partitions that you created. For more information on the procedure, see the *Preparing the OCR and Voting Disks for Clusterware* section in the *Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the first partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Place OCR (Primary) on this partition** and click **OK**.
  - d** Select the second partition and click **Edit**.
  - e** In the **Specify Disk Configuration** window, select **Place OCR (Mirror) on this partition** and click **OK**.
- 11** In the **Cluster Configure Storage** window, perform the following steps for the voting disk:
  - a** Locate the three 250 MB partitions that you created. For more information on the procedure, see the *Preparing the OCR and Voting Disks for Clusterware* section in the *Oracle Database on Microsoft Windows Server x64 – Storage and Network Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).
  - b** Select the first partition and click **Edit**.
  - c** In the **Specify Disk Configuration** window, select **Place Voting Disk on this partition** and click **OK**.
  - d** Repeat step b and step c on the remaining voting disk partitions.
- 12** Click **Next**.
- 13** Ignore the warning messages and click **OK**.
- 14** In the **Summary** window, click **Install** to start the installation procedure.

The **Install** window is displayed, and displays an installation progression bar.

The **Configuration Assistant** window is displayed and the OUI runs a series of configuration tools.

The **End of Installation** window is displayed.



**NOTE:** If a failure occurs in the **Configuration Assistant** window, perform the following steps:

- a In the error window, click **OK**.
- b In the **Configuration Assistant** window, click **Next**.
- c Ignore the warning message and click **OK**.
- d Click **Exit** to finish the OUI session.
- e In the **Exit** window, click **Yes**.

For more information, see the *Oracle Database on Microsoft Windows Server x64 – Troubleshooting Guide* available at [support.dell.com/manuals](http://support.dell.com/manuals).

- 15 Click **Exit** to finish the OUI session.
- 16 In the **Exit** window, click **Yes**.

## Applying Oracle Patch 7320726 for Windows Server 2008



**NOTE:** This section is applicable only if your Oracle 10g Database installation is on Windows Server 2008. You must install this patch before you install the database binaries.

The Oracle patch 7320726 resolves the expired digital signatures in the `ocfs.sys` and `orafencedrv.sys` files.

You can download the patch containing updated drivers from [metlink.oracle.com](http://metlink.oracle.com).

To apply Oracle patch 7320726:

- 1 Stop all Oracle services.
- 2 Navigate to the `\windows\system32\driver` directory and rename the `ocfs.sys` and `orafencedrv.sys` files.
- 3 Copy the new `orafencedrv.sys` and `ocfs.sys` files from the patch staging area.
- 4 Reboot your system.
- 5 Repeat step 1 to step 4 on all nodes.

After you have updated and rebooted all the nodes, you can proceed with the database installation.

# Installing Oracle 10g Database



**NOTE:** If you are installing Oracle using OCFS, skip these steps and go to "Installing Oracle® RAC 10g R2 Using OCFS" on page 9.

- 1 On node 1, insert the appropriate Oracle Clusterware installation media for your operating system as specified in Table 2-1 into your optical drive. The OUI starts and the **Welcome** window is displayed.

If the **Welcome** window is not displayed:

**a** Click **Start** and select **Run**.

**b** In the **Run** field, type:

`%CD-ROM drive%\autorun\autorun.exe`

where `%CD-ROM drive%` is the drive letter of your optical drive.

- 2 Click **OK** to continue.

The OUI starts and the **Welcome** window is displayed.

- 3 Click **Next**.

- 4 In the **Select Installation Type** window, click **Enterprise Edition** and click **Next**.

- 5 In the **Specify Home Details** window, under **Destination**, verify the following:

- In the **Name** field, the Oracle database home name is **OraDb10g\_home1**.

- In the **Path** field, the complete Oracle home path is

`%SystemDrive%\oracle\product\10.2.0\db_1`

where `%SystemDrive%` is your local drive.




**NOTE:** Record the path. You require this information later.




**NOTE:** The Oracle home path must be different from the Oracle home path that you selected in the Oracle Clusterware installation procedure.

You cannot install the Oracle Database 10g R2 Enterprise x64 Edition with RAC and Clusterware in the same home directory.

- 6 Click **Next**.

- 7 In the **Specify Hardware Cluster Installation Mode** window, click **Select All** and click **Next**.
- 8 In the **Product-Specific Prerequisite Checks** window, click **Next**.
- 9 In the **Select Configuration Option** window, select **Install database Software only**, and click **Next**.
- 10 In the **Summary** window, click **Install**.
- 11 After the installation is complete, the **End of Installation** window is displayed. Complete the procedures in the **End of Installation** window and then click **Exit**.  
 **NOTE:** You must complete the steps in the **End of Installation** window before you exit.
- 12 In the **Exit Window**, click **Yes**.

## Installing Oracle 10g R2 Patchset

 **NOTE:** This section is applicable only if your Oracle 10g database installation is on Windows Server 2003.

- 1 Ensure that you install only the 10.2.0.1 Clusterware and 10.2.0.1 database binaries on your system and that you do not create the seed database.
- 2 Download the patchset 10.2.0.4 from [metalink.oracle.com](http://metalink.oracle.com).
- 3 Unzip the patchset to *%SystemDrive%* which is your local drive.

### Installing Patchset 10.2.0.4 for Oracle 10g Clusterware

#### Before You Begin

Before you install patchset 10.2.0.4 for Oracle 10g Clusterware on your system, perform the following steps:

- 1 Stop `nodeapps` on all the nodes. Enter the following text in the command prompt:

```
%SystemDrive%\%CRS_HOME%\bin> srvctl stop nodeapps  
-n <node name>
```

where *%SystemDrive%* is the drive on which you configure the Oracle home and *%CRS\_HOME%* is the home directory that you created.

For more information on creating the home directory, see "Installing Oracle Clusterware" on page 9.

- 2 Select **Start**→**Programs**→**Administrator Tools**→**Services** to start **Programs Administrator Tools Services**.
- 3 Locate all Oracle services and stop them on both nodes.

### Installing the Patchset



**NOTE:** You must install the patchset from the node where you installed the RAC 10g R2 software. If you are not running the OUI from the same node, exit and install the patchset from that node.

- 1 Start the OUI located in the patchset folder.
- 2 In the **Welcome** window, click **Next**.
- 3 In the **Specify home details** window, select **OraCR10g\_home** from the drop-down menu and click **Next**.
- 4 In the **Specify Hardware Cluster Installation Mode** window, click **Next**.
- 5 In the **Product-Specific Prerequisite Checks** window, click **Next**.
- 6 In the **Summary** window, click **Install**.
- 7 In the **End of Installation** window, perform all the steps listed in the **Summary** window except step 1.
- 8 In the **End of Installation** window, click **Exit**.
- 9 Click **Yes** to exit from the OUI.

### Installing Patchset 10.2.0.4 for Oracle 10g Database



**NOTE:** Before you install the patchset, ensure that you start all the Oracle services.

Complete the following procedures before you create a listener and a seed database.

### Installing the Patchset



**NOTE:** You must install the patchset from the node where you installed the Oracle RAC 10g R2 software. If you are not running the OUI from the same node, exit and install the patchset from that node.

- 1 Start the OUI located in the unzipped area of the patchset.
- 2 In the **Welcome** window, click **Next**.

- 3 In the **Specify Home Details** window, select **OraDB10g\_home1** from the drop-down menu and click **Next**.
- 4 In the **Specify Hardware Cluster Installation Mode** window, click **Next**.
- 5 In the **Product-Specific Prerequisite Checks** window, click **Next**.
- 6 In the **Oracle Configuration Manager Registration** window, click **Next**.
- 7 In the **Summary** window, click **Install**.

During the installation, the following error may be displayed: **Error in writing to file oci.dll**. To avoid this error, perform the following steps:

- a Cancel the patchset installation.
  - b Rename the `%Oracle_home%\BIN` directory to `\bin_save`.
  - c Reboot the system.
  - d After the system reboots, rename the `\bin_save` file to `\bin`.
  - e Run the `setup.exe` file from the patchset folder. Allow all the Oracle default services to run.
- 8 In the **End of Installation** window, perform all the steps that the **Summary** tab displays.
  - 9 In the **End of Installation** window, click **Exit**.
  - 10 Click **Yes** to exit from the OUI.

## Configuring the Listener

This section describes the steps to configure the listener, which you need to connect to the database from a remote client.



**NOTE:** You must install the patch before you follow the procedure in this section.

Perform the following steps on node 1:

- 1 Click **Start**, select **Run**, and type `netca` and click **OK**.
- 2 In the **Real Application Clusters, Configuration** window, select **Cluster configuration** and click **Next**.
- 3 In the **Real Application Clusters, Active Nodes** window, select **Select all nodes** and click **Next**.
- 4 In the **Welcome** window, select **Listener configuration** and click **Next**.
- 5 In the **Listener Configuration** window perform the following steps:



- a In the **Listener** window, select **Add** and click **Next**.
  - b In the **Listener Name** window, accept the default setting in the **Listener name** field and click **Next**.
  - c In the **Select Protocols** window, select **TCP** in the **Selected protocols** field and click **Next**.
  - d In the **TCP/IP Protocol** window, select **Use the standard port number of 1521** and click **Next**.
  - e In the **More Listeners** window, select **No** and click **Next**.
- 6** In the **Listener Configuration Done** window, click **Next**.
- 7** In the **Welcome** window, click **Finish**.

## Creating the Seed Database

Perform the following steps to create the seed database using Oracle ASM:

- 1** Verify the Oracle Clusterware is running.
  - a Open a command prompt window. Click **Start** and select **Run**; type `cmd`; and press `<Enter>`.
  - b In the `cmd` window, type `crsctl check crs`  
 The output must display as follows:  

```
Cluster Synchronization Services (CSS) appears healthy
Cluster Ready Services (CRS) appears healthy
Event Manager (EVM) appears healthy
```
  - c If you cannot see the expected output, type `crsctl start crs`
  - d Type `exit` and close the `cmd` window.
- 2** Click **Start** and select **Run** on node 1.
- 3** In the **Run** field, type `dbca` and click **OK**:  
 The **Database Configuration Assistant** starts.
- 4** In the **Welcome** window, select **Oracle Real Application Clusters database** and click **Next**.
- 5** In the **Operations** window, click **Create a Database** and click **Next**.

- 6 In the **Node Selection** window, click **Select All** and click **Next**.
- 7 In the **Database Templates** window, click **Custom Database** and click **Next**.
- 8 In the **Database Identification** window, enter a name such as `racddb` in the **Global Database Name** field and click **Next**.
- 9 In the **Management Options** window, click **Next**.
- 10 In the **Database Credentials** window, click **Use the Same Password for All Accounts**, type and confirm a new password in the appropriate fields, and click **Next**.



**NOTE:** Record your new password. You require this information later during database administration.

- 11 In the **Storage Options** window, select **Automatic Storage Management (ASM)** and click **Next**.
- 12 In the **Create ASM Instance** window, perform the following steps:
  - a In the **SYS password** field, type and confirm a new password in the appropriate fields.
  - b Select **Create initialization parameter file (IFILE)**.
  - c Click **Next**.
- 13 In the **Database Configuration Assistant (DBCA)** window, click **OK**. The **ASM Creation** window is displayed, and the ASM Instance is created.



**NOTE:** If you see the following warning message: **Failed to retrieve network listener resources**, click **Yes** to allow the DBCA to create the appropriate listener resources.

- 14 In the **ASM Disk Groups** window, click **Create New**.
- 15 In the **Create Disk Group** window, perform the following steps:
  - a Enter a name for the new disk group, such as `databaseDG`.
  - b In the **Redundancy** box, select **External**.
  - c Click **Stamp Disks**.
  - d Select **Add** or change label and click **Next**.
  - e In the **Select disks** window, select the disks that you plan to use for the database files. After you select the disks, the status is marked as **Candidate device**.


- f** In the **Generate stamps with this prefix** field, keep the default settings and click **Next**.
  - g** In the **Stamp disks** window, click **Next**.
  - h** Click **Finish** to save your settings.
  - i** Select the check boxes next to the available disks and click **OK**.
- 16** In the **ASM Disk Groups** window, click **Create New**.
- 17** In the **Create Disk Group** window, enter the information for the Flash Recovery Area.
- a** In the **Disk Group Name** field, type a name for the new disk group. For example, FLASH.
  - b** In the **Redundancy** box, select **External**.
  - c** Click **Stamp Disks**.
  - d** In the **Select disks** window, select the disks that you plan to use for the Flash Recovery Area. After you select the disks, the status is marked as **Candidate device**.
  - e** In the **Generate stamps with this prefix** field, type **FLASH** and click **Next**.
  - f** In the **Stamp disks** window, click **Next**.
  - g** Click **Finish** to save your settings.
  - h** Select the check boxes next to the available disks and click **OK**.

The **ASM Disk Group** window is displayed, indicating that the software is creating the disk group. When the disk group creation is complete, the FLASH disk group is displayed in the **Disk Group Name** column.

- 18** In the **Database File Locations** window, select **Use Oracle-Managed Files**, **Multiplex Redo Logs**, and **Control Files** and click **Next**.
- 19** In the **Recovery Configuration** window:
- a** Select **Specify Flash Recovery Area**.
  - b** Click **Browse**.
  - c** Select the FLASH disk group that you created in step 17 and click **OK**.
  - d** In the **Flash Recovery Area Size** text box type the total size of the flash disk group that you created.

- e Select **Enable Archiving**.
  - f Click **Edit Archive Mode Parameters**.
  - g In the **Edit Archive Mode Parameters** window, ensure that the path listed under the **Archive Log Destinations** is as follows: **+FLASH/**, where **FLASH** is the Flash Recovery Area disk group name that you specified in sub-step a of step 17.
  - h Click **Next**.
- 20 In the **Database Content** window, click **Next**.
  - 21 In the **Database Services** window, click **Next**.
  - 22 In the **Initialization Parameters** window, click **Next**.
  - 23 In the **Database Storage** window, click **Next**.
  - 24 In the **Creation Options** window, click **Finish**.
  - 25 In the **Summary** window, click **OK**.

The **Database Configuration Assistant** window is displayed, and the Oracle software creates the database.

 **NOTE:** The database creation may take several minutes to complete.

When the database creation is complete, the **Database Configuration Assistant** window provides database configuration information.

- 26 Click **Password Management** to assign specific password to authorized users, if required. Otherwise click **Exit**. A message displays indicating that the cluster database is being started on all nodes.
- 27 Record the information in the **Database Configuration Assistant** window for future database administration.
- 28 Click **Exit**.

The **Start Cluster Database** window is displayed and the cluster database starts.