Dell PowerEdge Systems

Oracle Database on Microsoft Windows Server x64

Operating System and Hardware 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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Contents

1

Overview of Oracle Database Installation on Microsoft Windows Server x64

This document applies to:

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

Required Documentation for Deploying the Dell|Oracle Database

The documentation set for the Oracle Database on Microsoft Windows is organized into a series of modules. These modules cover the following topics:

- *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 Networking Guide*—Describes how to install and configure the network and the storage 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.

Terminology Used in This Document

This document uses the terms logical unit number (LUN), virtual disk, and volumes. These terms are synonymous and can be used interchangeably. The term LUN is commonly used in a Dell|EMC Fibre Channel storage system environment, virtual disk is commonly used in a direct-attached SAS (Dell MD3000/MD3000i and Dell MD3000/MD3000i with MD1000 expansion) storage environment and volume is commonly used in a Dell EqualLogic iSCSI storage system 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, visit **dell.com/oracle**.

For Dell technical support for your hardware and operating system software and to download the latest updates for your system, visit **support.dell.com**.

NOTE: Information about contacting Dell is provided in your system's *Oracle Database on Microsoft Windows Server x64 Operating System and Hardware Installation Guide*.

Dell Enterprise Training and Certification is now available; see **dell.com/training** for more information. The training service may not be offered in all locations.

Oracle Support

For information about Oracle software, application clusterware training, and contacting Oracle, see **oracle.com** or your Oracle documentation that shipped with the system components. For information on technical support, downloads, and other technical information, see **metalink.oracle.com**.

For information on configuring storage and networking, see the *Oracle Database on Microsoft Windows Server x64 Storage and Networking Guide*.

2

Software and Hardware Requirements

Minimum Software Requirements

Table 2-1 lists the minimum software requirements and supported configurations for Oracle Database on Microsoft Windows Server x64 Editions.

NOTE: Your Dell configuration includes a 30-day trial license of Oracle software. If you do not have a license for this product, contact your Dell sales representative.

Table 2-1. Software Requirements for Oracle Database on Windows Server x64 Editions

Oracle Database (x64) Edition	Oracle Configuration	Microsoft Windows (x64) Edition	EMC PowerPath (Fibre Channel Clusters Only)
Oracle Database 10g R2			
10g R2 Enterprise Edition	Release 10.2.0.1, including RAC option + 10.2.0.4 Patch Set	Server 2003 R2 SP2 Enterprise/Standard Edition	Version 5.3
10g R2 Standard Edition	Release 10.2.0.1, including RAC option + 10.2.0.4 Patch Set	Server 2003 R2 SP2 Standard Edition	Version 5.3

Table 2-1. Software Requirements for Oracle Database on Windows Server x64 Editions *(continued)*

Oracle Database (x64) Edition	Oracle Configuration	Microsoft Windows (x64) Edition	EMC PowerPath (Fibre Channel Clusters Only)
10g R2 Enterprise Edition	Release 10.2.0.4 including RAC option	Server 2008 SP2 Enterprise/Standard Edition	Version 5.3
10g R2 Standard Edition	Release 10.2.0.4 including RAC option	Server 2008 SP2 Standard Edition	Version 5.3

Minimum Hardware Requirements

Table 2-2 lists the minimum hardware requirements for Oracle Database 10g Enterprise Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard/Enterprise x64 Editions. For more information on specific hardware components, see the documentation included with your system.

NOTE: To achieve the desired performance, choose a system that exceeds the minimum hardware requirements based on the number of users, the applications you use, and batch processes.

NOTE: The hardware configuration of all the cluster nodes should be identical.

Table 2-2. Oracle Database 10g Enterprise Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard/Enterprise x64 Editions Minimum Hardware Requirements

Hardware Component	Configuration
Dell PowerEdge 1950 IIII, 2900 III, 2950 II, T610, T710, R610, R710, R810,R900, R910, M600, M610, M710, and M910 systems (up to eight nodes using Automatic Storage Management (ASM) or Oracle Cluster File System (OCFS)).	• Intel Xeon processor family. • 1 GB of RAM. • PERC for internal hard drives. • Two 73-GB hard drives connected to a PERC controller. **NOTE:** It is recommended that you use two 73-GB hard drives (RAID 1) connected to an internal RAID controller. See your PowerEdge system documentation for more details. • Three Gigabit NICs. • Two HBAs (1 QLE2462/QLE2562 [dual port] HBA for use with PowerEdge 1950/R610. • One QME2472/QME2572 or LPe1105-M4/LPe1205 [dual port] HBA for use with PowerEdge M600/M610/M710).

Table 2-2. Oracle Database 10g Enterprise Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard/Enterprise x64 Editions Minimum Hardware Requirements *(continued)*

Hardware Component	Configuration
Dell PowerEdge 6950, 2970, M605, R805, R815, and R905 systems (up to eight nodes using ASM or OCFS).	• AMD Opteron processor family. • 1 GB of RAM. • Two 73-GB hard drives connected to an internal RAID controller. **NOTE:** It is recommended that you use two 73-GB hard drives (RAID 1) connected to an internal RAID controller based on your system. See your PowerEdge system documentation for more details. • Three Gigabit NICs. • Two HBAs for use with PowerEdge 6950 or 2970. • One QME2472/QME2572 or LPe1105-M4/LPe1205 [dual port] HBA for use with PowerEdge M605/M805/M905.
Gigabit Ethernet switches (two)	See **dell.com/oracle** for information on supported configurations.
For Dell|EMC AX4-5F, CX3-10C, CX3-20, CX3-20F, CX3-40, CX3-40F, CX3-80, CX4-120, CX4-240, CX4-480, and CX4-960 Fibre Channel storage systems.	See the Dell|EMC system documentation for more details.
For direct-attached SAS Dell PowerVault MD3000 with MD1000 expansion storage system.	See your Dell PowerVault MD3000 and MD1000 storage system documentation for more details.
For direct-attached or switched iSCSI Dell PowerVault MD3000i with MD1000 expansion storage system.	See your Dell PowerVault MD3000i and MD1000 storage system documentation for more details.
Dell EqualLogic PS Series Storage.	One Dell EqualLogic PS Series array with sixteen 15,000 RPM SAS disks. Two Gigabit Ethernet switches for iSCSI SAN.

Table 2-3 lists the minimum hardware requirements for Oracle Database 10g Standard Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard x64 Editions. For more information on specific hardware components, see the documentation included with your system.

Table 2-3. Oracle Database 10g Standard Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard x64 Editions Minimum Hardware Requirements

Hardware Component	Configuration
Dell PowerEdge 1950 III, 2950 III, 2900III, T610, T710, R610, and R710 systems (up to two nodes using ASM).	• Intel Xeon processor family. • 1 GB of RAM. • PERC for internal hard drives. • Two 73-GB hard drives connected to a PERC controller. **NOTE:** It is recommended that you use two 73-GB hard drives (RAID 1) connected to an internal RAID controller based on your system. See your PowerEdge system documentation for more details. • Three Gigabit NICs. • Two HBAs. • One QLE2462/QLE2562 [dual port] HBA for use with PowerEdge 1950/R610.
Dell PowerEdge 2970, R805 systems (up to two nodes using ASM)	• AMD Opteron processor family. • 1 GB of RAM. • Two 73-GB hard drives connected to an internal RAID controller. **NOTE:** It is recommended that you use two 73-GB hard drives (RAID 1) connected to an internal RAID controller based on your system. See your PowerEdge system documentation for more details. • Three Gigabit NICs.

Table 2-3. Oracle Database 10g Standard Edition on Microsoft Windows Server 2003 R2 SP2 or Windows Server 2008 SP2 Standard x64 Editions Minimum Hardware Requirements *(continued)*

Hardware Component	Configuration
Gigabit Ethernet switches (two).	See **dell.com/oracle** for information on supported configurations.
For Dell|EMC AX4-5F, CX3-10C, CX3-20, CX3-20F, CX3-40, CX3-40F, CX3-80, CX4-120, CX4-240, CX4-480, and CX4-960 Fibre Channel storage systems.	See the Dell|EMC system documentation for more details.
For direct-attached SAS Dell PowerVault MD3000 with MD1000 expansion storage system.	See your Dell PowerVault MD3000 and MD1000 storage system documentation for more details.
For direct-attached or switched Dell PowerVault MD3000i with MD1000 expansion storage system.	See your Dell PowerVault MD3000i and MD1000 storage system documentation for more details.

3

Installing and Configuring the Operating System

CAUTION: To ensure that the operating system is installed correctly, disconnect all external storage from the system before you install the operating system.

This section provides information about installing and configuring the Microsoft Windows Server 2003 R2 SP2 and Windows Server 2008 SP2 Standard/Enterprise x64 Edition operating system for Oracle database deployment.

Before You Begin

NOTE: See **support.dell.com** for the latest BIOS, firmware, and driver updates.

1. Shut down your system.
2. Disconnect all external storage devices from your system.
3. Locate the correct *Microsoft Windows Server 2003 R2 SP2* or *Windows Server 2008 SP2 Standard/Enterprise x64 Edition* media and the *Dell Systems Management Tools and Documentation* media for your Dell Server using the information in Table 3-1.

Table 3-1. PowerEdge Server Systems Management Media

Dell PowerEdge System	Systems Management Media
6950, 1950, 2900, 2950, 2970, 1950 III, 2900 III, 2950 III, R805, R905, R900, M600, M605, M610, M710, M805, M905, T610, T710, R610, and R710.	Dell Systems Management Tools and Documentation media version 6.2.
R810, R815, R910, and M910.	Dell Systems Management Tools and Documentation media version 6.2.1

NOTE: The *Dell Systems Management Tools and Documentation* media is packaged with your Dell server.

Installing the Operating System Using the Dell Systems Management Tools and Documentation DVD

1. Turn on your system.
2. Insert the *Dell Systems Management* media for your system in your system drive. The **Dell Systems Build and Update Utility Welcome** window is displayed.

   NOTE: If your system does not have a CD/DVD drive, an externally attached USB CD/DVD drive can be used.
3. In the **Select Language** window, select **English**.
4. From the **Systems Deployment Options** table, click **Configure** from the same row that contains the **Server OS Installation** option. The **Configure Server Operating System Installation** window is displayed.

   The Server Operating System Installation (SOI) module in the Dell Systems Build and Update Utility enables you to install Dell-supported operating systems on your Dell systems.

   NOTE: For more information on using the specific SOI windows, see the Dell Systems Build and Update Utility online help.
5. In the **Set Date and Time** window of the SOI module, set the current date, time, and the time zone and click **Continue**.

6 In the **Select an Operating System to Install** window:

a Select **Microsoft Windows Server 2003 SP2 R2 x64 Edition** or **Microsoft Windows Server 2008 x64 (64 bit Edition)** as per the requirement.

b Click **Continue.**

7 In the **Select RAID Configuration** window, select default selections and click **Continue**.

NOTE: This menu may not appear depending on the system configuration.

8 If you selected **Microsoft Windows Server 2008 x64 (64 bit Edition)** on the **Select an Operating System to Install** window, go to step 11.

9 In the **Configure the Disk Partition** window,

a Choose to resize the boot partition or leave it at the default selection.

b Click **Continue**.

10 In the **Enter Operating System Configuration Information** window,

a Enter the appropriate organization, user name, product ID and Computer Name.

b Enter all the other necessary information.

c Click **Install SNMP** (default).

d Click **Install Server Administrator** (default) if you want to install the Dell OpenManage Server Administrator Utility.

NOTE: The Dell Server Administrator can be installed anytime after the operating system is installed.

e Click **Continue.**

11 For Windows Server 2008 x64 installation, click **Eject CD/DVD**. In the **Operating System Installation Summary** window, click **Eject CD/DVD Automatically** (default) and click **Continue**.

NOTE: Once you click Apply Now, the installation begins and you cannot change the configuration details of your system.

12 Click **Apply Now**.

The Systems Build and Update Utility installation begins.

NOTE: This procedure may take several minutes to complete.

13 If you selected Microsoft Windows Server 2003 Service Pack 2 x64 Edition when prompted, insert the appropriate Windows Server 2003 SP2 Enterprise or Standard x64 Edition media in the CD drive.

NOTE: This procedure may take several minutes to complete.

14 When the Systems Build and Update Utility installation is complete, the system automatically reboots.

NOTE: Ensure that you remove all bootable media when the system reboots.

15 On the reboot, the system boots into the operating system install.

NOTE: *Do not* boot directly to the operating system media in DVD-ROM.

Continuing With the Operating System Installation

Installing Windows Server 2003

1 If you chose Microsoft Windows Server 2003 R2 SP2 x64 Edition during the Dell Systems Build and Update Utility installation process then on the reboot, the system boots automatically into the Windows Server 2003 R2 SP2 x64 Edition install mode.

2 In the **Personalize Your Software** window in the Name and Organization fields, enter the appropriate information and click **Next**.

3 When prompted, enter your Product Key for Windows Server 2003 R2 SP2 Standard/Enterprise x64 Edition and click **Next**.

CAUTION: Do not leave the administrator password blank.

4 In the **Computer Name** and **Administrator Password** fields, enter the appropriate information and click **Next**.

NOTE: To configure the public network properly, the computer name and public host name must be identical.

NOTE: Record the logon password that you created in this step. You will need this information in step 5.

5 When the installation procedure is completed, the **Welcome to Windows** window is displayed.

a Shut down the system, reconnect all external storage devices, and start the system.

b In the **Welcome to Windows** window, press <Ctrl><Alt><Delete> to continue. The **Log On** window is displayed.

c In the **Password** field, type the administrator password that you created in step 4 in this procedure and click **OK**.

You are prompted to insert the *Microsoft Windows Server CD2*. You can insert the Windows Server CD2 or click **Cancel**.

NOTE: If you insert the Windows Server CD2, follow the prompts through the normal installation process. The following process assumes you are not inserting the Windows Server CD2.

d Click **Cancel**. A message is displayed informing you that media on Windows Server CD2 is not going to be installed.

e Click **OK.** You are prompted to configure Windows Server Post-Setup (optional).

f Click **Finish**. You are prompted to close the page.

g Click **Yes**. The **Manage Your Server Windows Management** window is displayed.

h Close the window.

NOTE: To use the Broadcom Advanced Control Suite 3 (BACS), install Microsoft .NET Framework 2.0. The Microsoft .NET Framework 2.0 can be downloaded from **microsoft.com**.

Installing Windows Server 2008 SP2

1 If you chose Microsoft Windows Server 2008 x64 (64 bit Edition) during the Dell Systems Build and Update Utility installation process then on the reboot the Systems Build and Update Utility installer will prompt to insert a valid Windows Server 2008 media into DVD drive. Insert the *Windows Server 2008 SP2* media into DVD drive and click **OK**.

2 Click **OK** on the **Valid Microsoft Windows Server 2008 SP2 media** window to start the installation.

3 In the next window, enter the language and other preferences and click **Next** to continue.

4 Click **Install now** to start the installation.

5 Key in the product key for activation and click **Next** to continue.

6 In the next window,

   a Select **Windows Server 2008 Enterprise (Full Installation)**.

   b Click **Next**.

7 In the **license term** window,

   a Check the box for **I accept the license terms.**

   b Click **Next**.

8 In the next window,

   a Select **Custom (Advanced) Installation.**

   b Select the disk where you want to install Windows.

   c Click **Next.**

   The installer starts the Windows installation.

   NOTE: This procedure may take several minutes to complete.

9 At the end of the installation, change the Administrator password.

CAUTION: Do not leave the administrator password blank.

NOTE: To use the Broadcom Advanced Control Suite (BACS), install Microsoft .NET Framework 2.0 or higher if not installed already. The Microsoft .NET Framework can be downloaded from **microsoft.com**.

Installing the Resource CD

NOTE: You can download the Windows Resource CD for your configuration from **dell.com/oracle**.

1 Insert the media labeled *Dell RCD x64 4.4*.

2 Double-click **My Computer**, and double-click your CD-ROM drive.

3 Run **install_drivers.bat**.

   NOTE: This procedure may take several minutes to complete.

4 Press any key to continue.

5 If you need to install the driver for a Qlogic Fibre Channel HBA on your system:
   - For Windows Server 2003, see installing the Driver "For Windows Server 2003:" on page 21.
   - For Windows Server 2008, see installing the Driver "For Windows Server 2008:" on page 22.
6 Check the logs to verify that all drivers were installed correctly.

   NOTE: Log information can be found at: <Primary Drive:/>Dell_Resource_CD/logs>.
7 When the installation is complete, remove the media from the CD drive.
8 Reboot your system.

Installing the Driver for a Qlogic Fibre Channel HBA

For Windows Server 2003:

1 Start the Device Manager as follows:
   a Click **Start**, and then click **Run**.
   b In the **Run** box, type `devmgmt.msc`, and then click **OK**.
2 In the **Device Manager** box, scroll down the list of hardware types, and then double-click **SCSI and RAID controllers**.
3 From the devices list, double-click **QLogic Fibre Channel HBA**.
4 Click the **Driver** tab, and then click **Update Driver** to start the Hardware Update Wizard.
5 Click **Install from a list or specific location (Advanced)**, and then click **Next**.
6 Click **Don't search I will choose the driver to install**, and then click **Next**.
7 Click **Have Disk**, and then navigate to the **<Primary_Drive:/>Dell_Resource_CD/drivers/R254072** folder.
8 In the **Hardware Update Wizard/Select a Device Driver** box, click **Next**.
9 On the **Hardware Update Wizard/Completing the Hardware Update Wizard**, click **Finish**.

For Windows Server 2008:

1. Start the Device Manager as follows:
   a. Click **Start**, and then click **Control Panel**.
   b. Click **Hardware and Sound**.
   c. Click **Device Manager**.
2. Scroll down the list of hardware types, and then double-click **Storage Controller**.
3. From the devices list, double-click **QLogic Fibre Channel HBA**.
4. Click the **Driver** tab, and then click **Update Driver** to start the **Hardware Update Wizard**.
5. Navigate to the **<Primary_Drive:/>Dell_Resource_CD/drivers/R254072** folder, and then click **Next**.
6. On the **Windows has successfully updated your software** window, click **Close**.

Verifying the Temporary Directory Paths

Verify that the paths to the Temp and Tmp directories have been set correctly. Repeat the following steps for all nodes in the cluster.

1. Click **Start** and select **Run**.
2. In the **Open** field, type `cmd` and click **OK**.
3. At the command prompt, type `echo %Temp%` and press <Enter>.

   The following path is displayed:

   `%SystemDrive%\Temp`

   where, `%SystemDrive%` is the user's local drive.

   If not, follow the procedure given below to change the paths to the Temp and Tmp directories.

   a. Right-click **My Computer** and select **Properties**.
   b. Under **Tasks**, select **Advanced System Settings**.
   c. In the **Advanced** tab, click **Environment Variables**.
   d. Under **User Variables for Administrator**, edit the **TEMP** variable, and set the variable value as `%SystemDrive%\Temp`.

e Execute step 3 to verify if the temp directory is set correctly.

4 At the command prompt, type `echo %Tmp%`, and press <Enter>.

The following path is displayed:

`%SystemDrive%\Temp`

where, `%SystemDrive%` is the user's local drive.

If the temp directory is not set, follow the procedure given below to change the same.

a Right-click **My Computer** and select **Properties**.

b Under **Tasks**, select **Advanced System Settings**.

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

d Under **User Variables for Administrator**, edit the **TMP** variable, and set the variable value as `%SystemDrive%\Tmp`.

e Execute step 4 to verify if the tmp directory is set correctly.

5 Repeat all steps in this section for all nodes in the cluster.

4

Verifying Cluster Hardware and Software Configurations

This section provides setup information for hardware and software cluster configurations.

Before setting up the cluster, ensure that you have the minimum hardware installed as shown in Table 4-1.

Each node must have the following software installed using:

- *Dell Systems Management Tools and Documentation* DVD (see Table 3-1).
- *Windows Server 2003 SP2 Standard/Enterprise x64 Edition* or *Windows Server 2008 SP2 Standard/Enterprise x64 Edition* (see Table 2-1).
- *Dell|Oracle Windows Resource* CD image version 4.3.

  NOTE: Ensure that the HBA drivers are installed.
- *PowerVault MD3000 Resource* CD or *PowerVault MD3000i Resource* CD (when using the PowerVault MD3000/MD3000i as back-end storage).

The storage must be configured with a minimum of four LUNs or virtual disks (two for the redundant Voting Disk and Oracle Cluster Registry and two for the database and Flash Recovery area) assigned to cluster nodes.

Table 4-1. Virtual Disk (LUN) Configuration and Sizes

LUNs or Virtual Disk	Minimum Size	Number of Partitions	Used for
1	3 GB	5 (3 x 275 MB and 2 x 300 MB)	Voting disk (3 x 275 MB) Oracle Cluster Registry (2 x 300 MB)
2	Larger than the database	1	Database
3	At least twice the size of the database	1	Flash Recovery Area