

Microsoft[®] Windows[®] Storage Server 2003
R2 x64 Edition With SP2

Administrator's Guide

Notes and Notices



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



NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

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Configuring Your System for the First Time

This document provides information about completing the configuration procedures on your system and a general overview of the Microsoft® Windows® Storage Server 2003 R2 x64 with SP2 operating system. For more information, see the operating system documentation located on the Dell™ Support website at www.dell.com/ostechsheets.

Overview

The Windows Storage Server 2003 R2 x64 Edition with SP2 operating system adds new search capabilities, simplified setup and storage management, extensibility, and is specially tuned to provide optimal storage server performance. Windows Storage Server 2003 R2 x64 Edition with SP2 provides significant enhancements in storage management scenarios, as well as ease of installation.

Your Dell PowerVault™ storage server is preconfigured with the operating system. Most of the setup procedures are completed for you and do not require user intervention.

When your system boots for the first time, the **Microsoft Mini-Setup** wizard begins. When completed, your system automatically reboots. After the configuration is completed, you can access the server either locally or remotely.

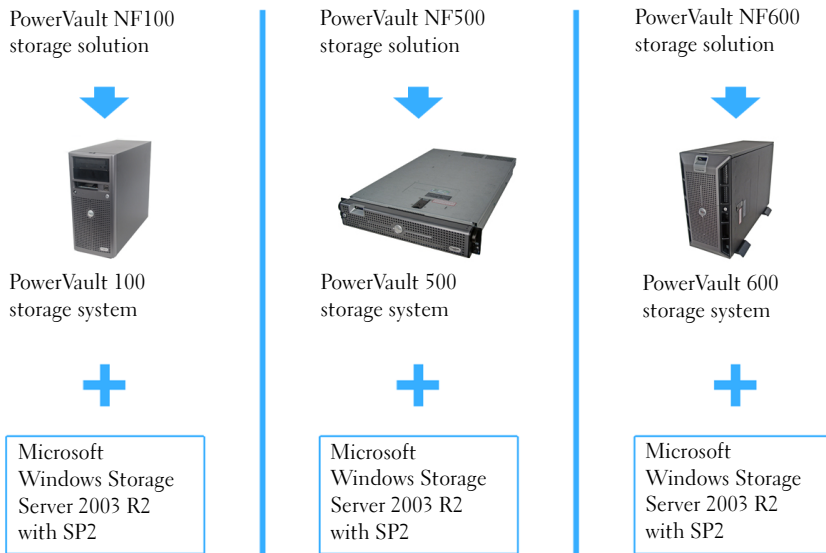
See the *Dell End User License Agreement for Microsoft Software* for specific information about supported configurations and software functionality limitations.

Naming Convention

The term *Dell PowerVault 100* refers to the hardware platform. *PowerVault NF100* refers to the configuration of PowerVault 100 storage system and Microsoft Windows Storage Server 2003 R2 with SP2 operating system.

The term *Dell PowerVault 500* refers to the hardware platform. *PowerVault NF500* refers to the configuration of PowerVault 500 storage system and Microsoft Windows Storage Server 2003 R2 with SP2 operating system. The term *Dell PowerVault 600* refers to the hardware platform. *PowerVault NF600* refers to the configuration of PowerVault 600 storage system and Microsoft Windows Storage Server 2003 R2 with SP2 operating system.

Figure 1-1. Naming Convention



Running Software RAID

If your system is preconfigured with the redundant array of independent disks (RAID) 5 software, RAID autosynchronization runs in the background and may require several hours to complete, depending on the array size. If you turn off your storage server during the autosynchronization procedure, the procedure will resume after restart.

Additionally, the autosynchronization procedure does not affect user operations but may affect overall system performance.

Default Administrator User Name and Password

When logging into the storage server for the first time, you must enter an administrator user name and password. The default administrator user name for your storage server is `administrator` and the default password is `storageserver`.

Changing the Administrator Password

- 1 Click **Start**→ **Administrative Tools**→ **Computer Management**.
- 2 In the **Computer Management** window, expand **Local Users and Groups** and select **Users**.
- 3 In the right window pane, right click **Administrator** and select **Set Password**.
- 4 In the **Set Password for Administrator** window, click **Proceed**.
- 5 Enter and confirm your password in the appropriate fields and click **OK**.
- 6 Close the **Computer Management** window.

Configuring the Network Address for the Storage Server

If you have a Dynamic Host Configuration Protocol (DHCP) server on your network, you are not required to configure your storage server's IP address because DHCP automatically assigns an address to the storage server. If your network is not configured with a DHCP server, configure the storage server's IP address in the **Network Configuration** window.

To access the Network Configuration window, click **Start**→ **Settings**→ **Control Panel**→ **Network Configuration**.



NOTE: If you do not have a DHCP server on your network, local keyboard, video, and mouse are required to complete your storage server configuration.



NOTE: The Windows Firewall is enabled by default. When you access the remote system, you may experience issues with connectivity.

See "Configuring the Network Connection" on page 11 for more information.

Configuring Your System For Network Access

- 1 Connect one end of the power cable to the storage server and the other end to a power source.
- 2 Connect one end of an Ethernet cable into one of the 10/100/1000 RJ-45 NIC connectors (see Figure 1-2) on the back of your storage server.
See your system's *User's Guide* for the location of your NIC connector(s).
- 3 Connect the other end of the Ethernet cable to a functioning Ethernet jack.
- 4 Turn on the storage server.
- 5 Verify that the server is connected to the Ethernet by ensuring that the LED associated with the NIC connector is illuminated. See Figure 1-2. If the NIC connector's LED is a steady green color, then the connection is good. If the NIC connector's LED is a flashing amber color, then data is successfully being transferred.

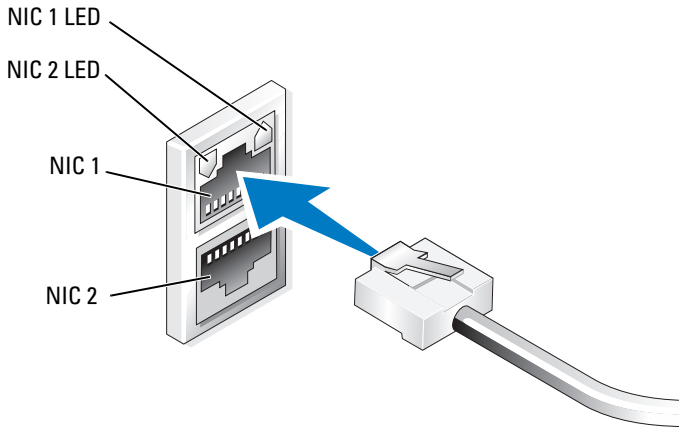
If the LED is not illuminated, ensure that each end of the Ethernet cable is seated properly in the NIC connector and the Ethernet jack.


The storage server retrieves the required information to set up network parameters (the IP address, gateway subnet mask, and DNS server address) from a DHCP server on the network.



NOTE: It may take several minutes for the storage server to boot, depending on your configuration and the amount of storage attached to the system.


Figure 1-2. NIC Connector



 **NOTE:** The NIC connector's physical orientation may vary depending on your system. See your system's *User's Guide* for more information.

Configuring the Network Connection

Configuring TCP/IP Using DHCP (Default)

 **NOTE:** To perform this procedure, you must be a member of the Administrators group or the Network Configuration Operators group on the local computer.

- 1 Click **Start**→ **Settings**→ **Control Panel**→ **Network Connections**.
- 2 Right-click the network connection that you want to configure, and click **Properties**.
- 3 On the **General** tab (for a local area connection) or the **Networking** tab (for all other connections), click **Internet Protocol (TCP/IP)** and click **Properties**.
- 4 Click **Obtain an IP address automatically**, and click **OK**.

Configuring TCP/IP Using a Static IP Address

The following procedure is required if a static TCP/IP configuration was previously used. By default, systems running Windows Storage Server 2003 operating systems attempt to obtain the TCP/IP configuration from a DHCP server on your network.




NOTE: To perform this procedure, you must be a member of the Administrators group or the Network Configuration Operators group on the local computer.


- 1 Click **Start**→ **Settings**→ **Control Panel**→ **Network Connections**.
- 2 Right-click the network connection that you want to configure, and click **Properties**.
- 3 On the **General** tab (for a local area connection) or the **Networking** tab (for all other connections), click **Internet Protocol (TCP/IP)** and click **Properties**.
- 4 Click **Use the following IP address**.
- 5 If you are configuring a local area connection, type the appropriate information in the **IP address**, **Subnet mask**, and **Default gateway** fields.
If you are configuring a connection, type the IP address in the **IP address** field.
- 6 Click **Use the following DNS server addresses**.
- 7 In the **Preferred DNS server** and **Alternate DNS server** field, type the primary and secondary DNS server addresses.
- 8 Configure additional IP addresses, if required. Otherwise, go to step 9.
 - a Click **Advanced**.
 - b On the **IP Settings** tab under **IP addresses**, click **Add**.
 - c Under **TCP/IP Address**, type an IP address and subnet mask in the appropriate fields, and click **Add**.
 - d Repeat step b and step c for each additional IP address.

- 9 Configure additional default gateways, if required. Otherwise, go to step 10.
 - a On the **IP Settings** tab under **Default gateways**, click **Add**.
 - b Under **TCP/IP Gateway Address** in the **Gateway** field, type the IP address of the default gateway.
 - c To manually configure a default route metric, clear the **Automatic metric** check box and type a metric in the **Metric** field.
 - d Click **Add**.
 - e Repeat step b through step d for each default gateway (if required).
- 10 Configure a custom metric for this connection, if required. Otherwise, go to step 11.
 - a Clear the **Automatic metric** check box.
 - b In the **Interface metric** field, type the appropriate metric.
- 11 Click **OK**.

Configuring Your System Using a Keyboard, Monitor, and Mouse

 **NOTE:** Depending on your method of configuration, local keyboard, video, mouse switch (KVM) connections may be required to complete the installation and configuration procedures. If your remote system can complete the configuration procedures, local KVM connections are not required for operation.

- 1 Connect a keyboard, monitor, and mouse to the storage server.
For information about system connectors, see your system's *User's Guide*.
- 2 Turn on the storage server.
- 3 Log in to the storage server.

 **NOTE:** The default administrative user name is `administrator` and the default password is `storageserver`.

Changing the Computer Name



NOTE: When you change your computer name, reestablish your remote desktop connection using the new computer name.

- 1 Click **Start**→ **Settings**→ **Control Panel**→ **System**.
- 2 In the **System Properties** window, click the **Computer Name** tab and click **Change**.
- 3 In the **Computer Name Changes** window in the **Computer name** field, type the name that you want to assign to your system and click **OK**.
- 4 Click **OK** to close the **System Properties** window.
- 5 When prompted, restart your system.

Joining a Domain

- 1 Click **Start**→ **Settings**→ **Control Panel**→ **System**.
- 2 In the **System Properties** window, click the **Computer Name** tab and click **Change**.
- 3 In the **Member of** box, select **Domain**.
- 4 In the **Domain** field, type the name of the domain you want to join and click **OK**.
- 5 When prompted, enter a user name and user password to join the system to the domain.
- 6 Click **OK** to close the **System Properties** window.
- 7 When prompted, restart your system.

Localizing Your System Using the Multilanguage User Interface

The storage server allows you to change the native language for operating system's user interface. The Multilanguage User Interface (MUI) allows the storage server to display operating systems menus, dialogs, and help files in multiple languages. Many MUI packs are installed on your system by default.

If your system was preconfigured with the Windows Storage Server 2003 R2 x64 Edition with SP2 operating system, the MUI is preconfigured with your localized language. No user intervention is required. If the operating system was not preconfigured on your system or you are reinstalling the operating system, you must reinstall the MUI language.

The following subsection provides information about reapplying the MUI language on your system.

Applying the MUI Language

After a MUI language has been installed, you can apply it to any user by performing the following steps:

- 1** Click the **Start**→**Settings**→**Control Panel**→**Regional and Language Options**.
- 2** On the **Regional Options** tab, select the appropriate region under **Standards and Formats**.
- 3** Update your Web browser default language and character encoding.

If you are using Windows Explorer, perform the following steps:

- a** Open a browser window.
- b** Select **Tools** → **Internet Options**.
- c** In the **Internet Options** window, click **Languages**.
- d** In the **Language Preference** window, click **Add**.
- e** In the **Add Language** window, select a language and click **OK**.
- f** In the **Language** box, verify that the correct language appears. To remove a language, select the language and click **Remove**.
- g** Click **OK**.
- h** Close the **Internet Options** window.

If you are using Firefox, perform the following steps:

- a** Open a browser window.
- b** Select **Tools**→**Options**.
- c** In the **Options** window in the **Languages** box, click **Languages**.
- d** In the **Languages and Character Encoding** window, make the appropriate selections and click **OK**.
- e** Close the **Options** window.

- 4 Click the **Languages** tab and select the appropriate language used in menus and dialogs.
- 5 Log off and log in to the system again to enable the new MUI language.



NOTE: Ensure that you have installed the Microsoft Knowledge Base article 925148 for MUI. You can download the Knowledge Base article from the Microsoft Support website at support.microsoft.com.

Windows Storage Server Management Console

The **Windows Storage Server Management Console** appears in the Microsoft Management Console (MMC), providing an easy and convenient method for system administration. The MMC opens automatically when you are logged into the Windows Storage Server 2003 R2 x64 Edition operating system.

To open the **Windows Storage Server Management Console**, click **Start**→**All Programs**→**Windows Storage Server Management**.

In the **Management Console** window, the left window pane shows the **File Server Management (Local)** node as the default node. The center window pane provides selectable scenarios that assist you with operating system administration.

Accessing the Microsoft Management Console

The MMC is configured by default as part of the Microsoft Start menu. The MMC can be used for disk management, configuring NFS, and as a general NAS management station. See the Microsoft MMC document included with your system for more information.

Using MMC, you can configure your storage using one of the following methods:

- Access the MMC locally on the host
- Access the MMC remotely using Remote Desktop



NOTE: Using the MMC to manage a remote system is supported.

Accessing the MMC Locally on the Host

The MMC appears on the host as a selectable item in the **Start** menu. If the MMC does not appear in the **Start** menu after startup, perform the following steps:

- 1 Click **Start**→**Run**.
- 2 In the **Open** field, type the following and click **OK**:

```
nas.msc
```



NOTE: The `nas.msc` file is located at `C:\windows\system32`.

Accessing the MMC Remotely Using Remote Desktop

Using Remote Desktop for remote server administration can reduce the overhead associated with remote administration. Enabled by Terminal Services technology, Remote Desktop for Administration is specifically designed for server management.

Remote Desktop for Administration does not require special licenses for client systems that access the server. Additionally, you are not required to install Terminal Server Licensing when using Remote Desktop for Administration.

Administrators can also fully administer computers running Windows Storage Server 2003 R2 x64 Edition with SP2 from computers running earlier versions of Windows by installing Remote Desktop Connection.



NOTE: To connect to Remote Desktop for Administration from a remote system, use Remote Desktop Connection.

Creating and Saving a Remote Desktop Connection To Your Desktop

To create and save a Remote Desktop connection to Windows Storage Server 2003 R2 x64 Edition with SP2, perform the following steps:

- 1 Click **Start**→**Run**.
- 2 In the **Open** field, type the following and then click **OK**.

```
mstsc
```

The **Remote Desktop Connection** window appears.

- 3 In the **Computer** field, type the computer name of the storage server and then click **Options**.

The default system name is Dellxxxxxx, where xxxxxx is the system's service tag number. For example, if your service tag number is 1234567, type DELL1234567.



NOTE: If you cannot connect to the system through a remote desktop connection, you must use a keyboard, monitor, and mouse to configure the IP address, gateway subnet mask, and DNS server. See "Configuring the Network Connection" on page 11.

- 4 In the **Remote Desktop Connection** window in the **Connection settings** box, click **Save As**.
- 5 In the **Save As** window in the **File name** field, type a name for the connection and include the default **.rdp** extension.
- 6 In the **Save in** drop-down menu, select **Desktop** and then click **Save**.

Your connection is saved to your desktop.

- 7 Initiate the remote desktop connection. When prompted, enter the default administrative user name and password for your system, and then click **OK**.



NOTE: The default administrative user name is `administrator` and the default password is `storageserver`.

- 8 Use the MMC to begin setting up shares and volumes on the storage server. See "Accessing the Microsoft Management Console" on page 16.

For more information about configuring your remote desktop connection, click **Help** in the **Remote Desktop Connection** window.

Installing Dell OpenManage Server Administrator

For information on installing Dell OpenManage™ Server Administrator, see the *Microsoft Windows Storage Server 2003 R2 x64 Edition with SP2 Getting Started Guide* on the Dell Support website at support.dell.com.

Operating System Features

The Microsoft® Windows® Storage Server 2003 R2 x64 Edition with SP2 operating systems supports some of the components that Microsoft provides as part of the Windows Server® R2 release. Depending on your Windows edition, the supported components are preinstalled and configured on your system.

See your Windows Storage Server 2003 R2 x64 Edition with SP2 online help for more information.

Table 2-1 provides a list of supported Windows Storage Server 2003 R2 x64 Edition with SP2 components.

Table 2-1. Windows Storage Server 2003 R2 x64 Edition With SP2 Components

Component	Express	Workgroup	Standard	Enterprise
File Server Management	X	X	X	X
Print Management	X	X	X	X
Microsoft Services for Network File System	X	X	X	X
Microsoft .NET Framework 2.0	X	X	X	X
Common Language Runtime Version 2.0	X	X	X	X
Hardware Management	X*	X*	X*	X*
Distributed File Systems Management	NS	X	X	X
Distributed File Systems Replication	NS	X	X	X
Distributed File Systems Replication Diagnostics and Configuration	NS	X	X	X
File Server Resource Manager (FSRM)	NS	X	X	X

X = Installed; X* =Supported but not installed; NS = Not supported

**Table 2-1. Windows Storage Server 2003 R2 x64 Edition
With SP2 Components (continued)**

Component	Express	Workgroup	Standard	Enterprise
Storage Manager for Storage Area Networks	NS	NS	X	X
Single Instance Storage	NS	NS	X*	X*
Windows SharePoint® Services 2.0 Service Pack 2	NS	NS	X*	X*
Active Directory Application Mode	NS	NS	NS	NS
Active Directory Federation Services	NS	NS	NS	NS

X = Installed; X* = Supported but not installed; NS = Not supported

To install additional Windows Storage Server 2003 R2 x64 Edition with SP2 components on your system, perform the following steps:

- 1** Locate your operating system installation media.
- 2** Click **Start**→ **Settings**→ **Control Panel**→ **Add or Remove Programs**.
- 3** In the **Add or Remove Programs** window, click **Add or Remove Windows Components**.
- 4** In the **Windows Components Wizard** window, select a component to install. If your desired component is not listed in the **Components** list, the component is not supported by the operating system.
- 5** Click **Next** to continue.
- 6** Follow the directions on your screen to complete the installation.

File Server Management

You can use File Server Management to perform many tasks, which include:

- Formatting volumes
- Creating shares
- Defragmenting volumes
- Creating and managing shares
- Setting quota limits

- Creating storage utilization reports
- Replicating data to and from the file server
- Managing Storage Area Networks (SANs)
- Sharing files with UNIX® and Macintosh systems

Print Management

Print Management is an updated Microsoft Management Console (MMC) snap-in that you can use to view and manage printers and print servers in your organization. You can use Print Management from any computer running Windows Storage Server 2003 R2 x64 Edition with SP2, and you can manage all network printers on print servers running Windows 2000 Server, Windows Server 2003, Windows Storage Server 2003, Windows Server 2003 R2, or Windows Storage Server 2003 R2.

Print Management provides details such as the queue status, printer name, driver name, and server name. You can also set custom views by using the Print Management filtering capability. For example, you can create a view that displays only printers in a particular error state. You can also configure Print Management to send e-mail notifications or run scripts when a printer or print server needs attention. The filtering capability also allows you to edit print jobs in bulk, such as canceling all print jobs at once. You can also delete multiple printers at the same time.

Administrators can install printers remotely by using the automatic detect feature, which locates and installs printers on the local subnet to the local print server. Administrators can log on to a local server at a branch location by using Remote Desktop and then easily install printers remotely.

Microsoft Services for Network File System

Microsoft Services for Network File System (NFS) is an operating-system component that provides a file-sharing solution for enterprises with a mixed Windows and UNIX environment. Microsoft Services for NFS allows users of UNIX-based computers to store and access files on your operating system using the Network File System (NFS) protocol. All of your UNIX clients can access the resources using the NFS protocol with no changes required.

Single Instance Storage

Single Instance Storage (SIS) recovers disk space by reducing the amount of redundant data stored on a volume. To recover the disk space, SIS performs the following procedures:

- Identifies identical files
- Stores one copy of the file in the SIS common store
- Replaces the files with pointers to the file in the SIS common store.

For example, user 1 and user 2 receive the same e-mail with an attachment. Both users save the attachment to their home folder. SIS detects the two identical files on the volume, moves one of the copies into the SIS common store, and then replaces both files with a pointer to the file in the SIS common store.

Some time later, user 1 makes a change to the file. SIS immediately detects that an update is pending for the file, removes the pointer in the user's home folder, and replaces the pointer with a copy of the file in the SIS common store. Then, the updates are applied to a fresh copy of the original file. This process is completely transparent to the application.

The file of user 2 remains in the SIS common store with a pointer in the user's home folder, even if there is only one pointer to the file. When user 2 updates the file (assuming there are no other pointers), the pointer is deleted and replaced with a copy of the original file. The file in the SIS common store is deleted.

SIS works in the background and does not require user intervention.

The administrator can enable SIS on a per volume basis. For best results, the administrator should use a backup application that supports SIS.

Single Instance Storage Administration

SIS can be managed only through `sisadmin.exe`—the command line tool. Table 2-2 lists the `sisadmin.exe` command line parameters.

Table 2-2. `sisadmin.exe` Command Line Parameters

Command	Description
<code>/i [vol]</code>	Installs SIS on all volumes, creates common store, and activates filter and groveler.
<code>/f [vol]</code>	Places the groveler into foreground mode.
<code>/b [vol]</code>	Places the groveler into background mode.
<code>/e</code>	Enables the groveler on all volumes.
<code>/d</code>	Disables the groveler on all volumes.
<code>/v [vol]</code>	Displays statistics about SIS usage on volumes (including disk space saved).
<code>/l [vol]</code>	Lists SIS-controlled volumes.
<code>/s [file]</code>	Displays information about the SIS files.
<code>/h or /?</code>	Displays the Help text.

File Server Resource Manager

File Server Resource Manager is a new MMC snap-in that provides a suite of tools for administrators to understand, control, and manage the quantity and type of data stored on their systems. File Server Resource Manager supports:

- Placing quotas on folders and volumes to restrict the quantity of stored data
- Storing active screen files on the system to prevent certain file types or only allow certain file types that are defined by the administrator
- Reporting storage usage

Distributed File System (DFS)

The Distributed File System (DFS) solution in Windows Storage Server 2003 R2 x64 Edition with SP2 provides simplified, fault-tolerant access to files and Wide Area Network-friendly replication. Distributed File System consists of two technologies:

- DFS Namespaces — DFS Namespaces allows administrators to group shared folders located on different servers and present them to users as a virtual tree of folders called a namespace. A namespace provides numerous benefits, including increased availability of data, load sharing, and simplified data migration.
- DFS Replication — The successor to File Replication Service (FRS), DFS Replication is a new state-based, multimaster replication engine that supports scheduling and bandwidth throttling. DFS Replication uses a new compression algorithm called Remote Differential Compression (RDC). RDC is a protocol that can be used to efficiently update files over a limited-bandwidth network. RDC detects insertions, removals, and rearrangement of data in files, enabling DFS Replication to replicate only the deltas (changes) when files are updated.

Storage Management for SANs

Storage Manager for SANs is an MMC snap-in that helps you create and manage logical unit numbers (LUNs) on Fibre Channel and iSCSI disk drive subsystems in your SAN. Storage Manager for SANs can be used on storage subsystems that support Virtual Disk Service (VDS).

Use Storage Manager for SANs to create and assign LUNs, manage connections between the LUNs and the servers in your SAN, and set the security properties for iSCSI storage subsystems.

Indexing Service

Indexing Service extracts information from a set of documents and organizes the information for quick and easy access by the *search* function for systems running Windows 2000, Windows XP, or Windows Storage Server 2003 with SP2. This information can include the document's contents, characteristics, and parameters such as the author's name. When the index is created, you can query the index for documents that contain key words, phrases, or properties.

For example, you can query all documents containing the word "product," or you can query for all Microsoft Office documents written by a specific author. Indexing Service returns a list of all documents that meet your search criteria.

Windows SharePoint Services

Windows SharePoint® Services is an integrated portfolio of collaboration and communication services designed to connect people, information, processes, and systems both within and beyond the organizational firewall. Windows SharePoint Services 2.0 Service Pack 2 is included in the Windows Storage Server 2003 R2 Standard and Enterprise x64 Editions with SP2.

Windows SharePoint Services 2.0 includes the following features:

- SharePoint sites
- SharePoint central administration
- Application for Windows SharePoint Services

SharePoint sites

Web sites based on Windows SharePoint Services 2.0 provide a place where teams can communicate, share documents, and collaborate on a project.

SharePoint sites include:

- Team collaboration features — Includes event calendars, contacts, Web links, discussions, issues lists, and announcements.
- Document libraries — Locations where users can store and retrieve documents while taking advantage of additional features, such as check-in and check-out, version history, custom metadata, and flexible, customizable views.
- Web Parts — Provide data access, Web services, and many other applications and content to SharePoint sites.

Site users can contribute to the site by using a Web browser. However, if users have Windows SharePoint Services-compatible client programs—such as Microsoft Office 2003— installed on their systems, they can work seamlessly with the site. Users can save files to libraries, edit documents in the client program, and move or link that information to the site.

SharePoint Central Administration

You can manage a single server or an entire server farm running Windows SharePoint Services from SharePoint Central Administration—a Web browser interface. Use SharePoint Central Administration to perform the following tasks:

- Extend a virtual server
- Create sites or turn on Self-Service Site Creation so users can create their own sites
- Manage security settings
- Manage the list of servers in your server farm

Additionally, you can use the `stsadm.exe` command-line utility to manage your servers running SharePoint Services.

Applications for Windows SharePoint Services

Windows Sharepoint Services includes a number of built-in applications. Boost worker productivity by downloading and installing an application for Windows SharePoint Services. These applications are tailored to address specific processes or tasks. You can choose from tasks such as recruiting, project management, help desk issue tracking, timesheet and scheduling, and event planning. Use the applications as soon as you install them or customize them further to meet your organization's specific needs and requirements.

Hardware Management

Windows Storage Server 2003 R2 x64 Editions with SP2 include Hardware Management—an optional component that consists of a set of features designed to improve system hardware management. See Table 2-1 for a list of Windows Storage Server 2003 R2 x64 Editions with SP2 that support Hardware Management.



NOTE: For more information regarding the Hardware Management component, see the related article on the Microsoft website at www.microsoft.com/technet/scriptcenter/preview/wsm/intro.mspx. This component is not installed by default.

When installing the Hardware Management component on a system that has a Baseboard Management Controller (BMC), the following message may appear:

```
An IPMI device has been registered within the system
BIOS; all 3rd party IPMI drivers must be removed from
the system prior to installation in order to prevent
system instability; if all 3rd party drivers have been
removed or you wish to ignore this risk press 'OK'
otherwise press 'Cancel'.
```

Before proceeding, it is recommended that you uninstall all third-party IPMI drivers.

After the Hardware Management component is installed, manually install the IPMI device driver using the following commands (if required):

- To install the driver: `Rundll32 ipmisetp.dll, AddTheDevice`
- To uninstall the driver: `Rundll32 ipmisetp.dll, RemoveTheDevice`



NOTE: Dell OpenManage 5.3 supports Windows Storage Server 2003 R2 x64 with SP2 IPMI driver. If you are using OpenManage 5.3 to manage your systems, it is recommended that you uninstall the Windows Storage Server 2003 R2 x64 with SP2 IPMI driver using these commands.

The IPMI device can be viewed in Device Manager under "System Devices" under the entry "Microsoft Generic IPMI Compliant Device."



NOTE: For more information regarding the impact of the Windows Storage Server 2003 R2 x64 with SP2 IPMI driver on the Dell OpenManage suite and possible limitations in OpenManage, see the Dell Support website at support.dell.com.

RAID and Disk Management

Your storage server is available from Dell™ in either a software redundant array of independent disks (RAID), a hardware RAID, or an external storage configuration. The following is an overview of supported storage server configurations:

- In a software RAID configuration, the RAID functionality is configured by the Microsoft® Windows® Storage Server 2003 R2 x64 Editions with SP2 operating systems.
- In a hardware RAID configuration, the hard drives are controlled by an on-board and/or an optional RAID controller in the system's expansion slot.
- The internal system hard drives are controlled by hardware RAID or software RAID. The external enclosure hard drives are controlled by the RAID controller in the PCI or PCIe slot.



NOTE: Although you can change RAID levels on your storage server, you cannot change the basic configuration of your storage server. For example, you cannot change a system from a software RAID configuration to a hardware RAID configuration.



NOTE: Configuring software RAID on top of hardware RAID is not supported.

Determining Your RAID Configuration

The storage server RAID configuration affects some of the configuration procedures. As a result, determine the RAID configuration of your storage server before you perform the procedures in the remaining portion of this guide.

To determine if your RAID configuration is hardware or software based, perform the following steps:

- 1 On the Windows desktop, right-click **My Computer** and select **Manage**.
- 2 In the **Computer Management** window, click **Device Manager**.
- 3 In the **Computer Management** right window pane, expand **SCSI and RAID Devices**.

If a PowerEdge Expandable RAID Controller (PERC) or a Cost Effective RAID Controller (CERC) hardware RAID controller *is* listed under SCSI and RAID Devices, the system is configured with *hardware* RAID.

If a PERC or CERC hardware RAID controller *is not* listed under SCSI and RAID Devices, the system is configured with *software* RAID.

Software RAID

If your system is preconfigured with software RAID 5, the system performs a RAID synchronization to optimize the array. The process runs in the background and may affect your overall system performance until it completes. If the system is powered off before the process completes, RAID synchronization will begin again when the system is powered up and continue until it completes.

Table 3-1 provides information about the supported RAID configurations.

Table 3-1. Software RAID Configurations

RAID Configuration	Configuration	Unpartitioned Space
RAID 1	Two system hard drives 8 GB operating system partition	40 MB
RAID 5	Four hard drives 8 GB operating system partition	Varies depending on drive capacity

Disk Management

Windows Storage Server 2003 R2 x64 Edition with SP2 features the Disk Management utility, which enables you to configure your storage devices and the logical volumes contained in your system. The Disk Management utility displays storage configuration in list and graphical views. The list view shows a list of all the physical devices and their properties. The graphical view shows your storage as logical volumes. Each view provides menus of commands for configuring and managing your system storage.

This section describes how to use the Windows Disk Management tool to manage basic and dynamic volumes.

Initializing a Disk

When you create a virtual disk and perform a rescan in a hardware RAID or external storage configuration or when a new disk is discovered on a system with a software RAID configuration, the disk appears with the statement **Disk Type of Unsigned Disk**. An unsigned disk cannot be used until it is initialized.

To initialize a disk, right-click the unsigned disk. A menu displays showing the **Initialize Disk** command. (The **Initialize Disk** command appears only if a disk does not include a signature.) Select this command to write a signature on the disk.

After a signature is written on a disk, the disk displays as a **Basic Disk**. You can create partitions on the basic disk, or you can upgrade the disk from basic to dynamic and create volumes on the disk.



NOTE: In hardware RAID configurations, the *operating system* disk must remain a basic disk. However, you can upgrade all data disks to dynamic during creation by using the Windows Disk Management utility.

Upgrading a Basic Disk to a Dynamic Disk

You can only use dynamic disks for online volume extension. Hence, Dell recommends that you use the Disk Management utility to upgrade all data disks on your system to dynamic. The upgrade includes new disks, which have been added to the system as basic disks.



NOTE: In hardware RAID configurations, the *operating system* disk must remain a *basic* disk.



NOTE: Software RAID installed on a hardware RAID system is not supported.

To upgrade a basic disk to a dynamic disk, perform the following steps:

- 1 Right-click the disk you want to upgrade, and then click **Convert to Dynamic Disk**.
- 2 When the **Convert to Dynamic Disk** window appears, select the disks to upgrade and click **OK**.
- 3 When the **Disks to Convert** window appears, select the disks that you want to convert to dynamic and click **Convert**.



NOTE: After a disk is upgraded to a dynamic disk, it cannot be reverted to a basic disk unless all volumes on that disk are removed. Dell strongly recommends that you do not revert a disk back to basic after data volumes are present.

Reactivating Dynamic Disks

A dynamic disk might appear as a missing disk when it is corrupted, powered down, or disconnected. To reactivate a dynamic disk, perform the following steps:

- 1 Right-click the disk marked **Missing** or **Offline dynamic disk**.
- 2 Click **Reactivate Disk** on the menu.
- 3 Mark the disk as online after the disk is reactivated.

Merging Foreign Disks

Dynamic disks with a foreign status are disks that were moved from another system. You cannot reactivate a foreign disk; you must merge the disk to the system. To change the status of a foreign disk and enable it to be seen as a part of the current system, use the **Merge Foreign Disk** command.

To merge foreign disks, perform the following steps:

- 1 Right-click a foreign disk, and then click **Import Foreign Disks**.
The **Import Foreign Disk Wizard** is displayed.
- 2 Select the foreign disks that you would like to merge to the system.
By default all foreign disks are selected to be merged.
- 3 Click **Next**.
- 4 Click **Next** again to validate the volume status of each foreign disk.
- 5 Click **Finish**.

Volume Overview

A volume is a logical entity that consists of portions of one or more physical disks. A volume can be formatted with a file system and can be accessed by a drive letter.

Like disks, volumes can be configured as basic or dynamic. Basic volumes refer to all volumes that are not on dynamic disks. Dynamic volumes are logical volumes created from dynamic disks.

It is recommended that you create all data volumes on dynamic disks. On a hardware RAID system, only the operating system disk should remain basic.

Checking Partition or Volume Properties

- 1 Right-click the partition or volume to be checked.
- 2 From the context menu, select **Properties**.
The **Properties** window displays.
- 3 Review the properties for your volume.

Formatting a Partition or Volume

- 1 Right-click the volume or partition that you want to format, and then click **Format**.



NOTICE: A warning message appears, stating that all data on the partition will be lost and prompts you to format the disk.

- 2 Click **Yes** to reformat the disk.
- 3 When prompted, select **NTFS** as the file system type.



NOTE: Your storage server supports only NTFS partitions. Formatting all partitions as NTFS allows for advanced features only available under that file system.

- 4 Enter a label for the volume.

The label appears on the Array Manager console. If a name has been selected, this name appears in the **Name** field. You can change the name by typing a different name.

5 Enter an allocation size or use the default, which is automatically selected.



NOTE: If you use NTFS file compression on the source volume, you cannot use an allocation unit size larger than 4 KB. Defragmenting a source volume with shadow copies causes the difference file, which contains all changed data, to grow. If the difference file grows beyond the allocated space, you might lose previous versions of some files. Having a large NTFS file cluster size decreases the growth of the difference file.

6 Select the file system type and formatting options:

- **Perform a quick format** — Formats the volume or partition without scanning for bad sectors in the volume or partition. Check this box to use this format method.



NOTE: To decrease the disk formatting time, use the **Quick Format** option.

- **Enable file and folder compression** — Used only if you selected the NTFS format. Check this box to use this format method.

7 Click **OK** to begin formatting.

A progress bar displays in the list view.

Deleting a Partition or Volume



NOTICE: You must delete all shares and shadow copies from your volume before you delete the volume. If a volume is removed before all shares of that volume have been removed, the NAS MMC may not display the shares correctly.

1 Right-click the designated volume, and then click **Delete Volume**.

2 Click **Yes** to delete or **No** to cancel.

The volume is removed immediately if you click **Yes**.

Working With Dynamic Volumes

Dynamic volumes are volumes created on dynamic disks using the Disk Management tool. This section discusses how to create and extend dynamic volumes.

Creating a Dynamic Volume

- 1 Launch the **Disk Management** utility.
- 2 In the bottom half of the window, right click on the basic disk that you want to configure as dynamic and click **Convert to Dynamic Disk**.
- 3 In the **Convert to Dynamic Disk** window, click to select the disk(s) that you want to convert and then click **OK**.
- 4 When the **Disks to Convert** window appears, click **Convert**.

Extending a Dynamic Simple or Spanned Volume

You can extend a volume only if the following are true:

- The volume is formatted as NTFS.
- The volume was originally created on a dynamic disk.
- Unallocated space exists on a dynamic disk onto which the volume will be extended.

You cannot extend a volume if any of the following are true:

- The volume is formatted as FAT or FAT32.
- The volume is using software RAID (striped, mirrored, or RAID 5 volume).
- Unallocated space is not available on a dynamic disk.

You can extend simple and spanned volumes on dynamic disks onto a maximum of 32 dynamic disks. However, after a volume is extended, it cannot be mirrored or striped using software RAID. Additionally, no portion of a spanned volume can be deleted without deleting the entire spanned volume.

- 1 Right-click the simple or spanned volume you want to extend, and then click **Extend Volume**.

The selected volume appears in the dialog box along with its current size.

- 2 Enter the amount to extend the volume, and then click **OK**.
- 3 Click **OK**.

The volume now shows the size of the extended volume.

For more information about extending volumes, see the context-sensitive online help.

Working With Mirrors

A mirrored volume duplicates your data to two physical disks. A mirror provides data redundancy by simultaneously writing the same data to two separate volumes that reside on different disks. If one of the disks fails, data continues to be written to and read from the unaffected disk.

This section discusses how to add, remove, or break a mirror.

Adding a Mirror

- 1 Launch the **Disk Management** utility.
- 2 In the graphical view pane, right-click the volume you want to add a mirror to and click **Add Mirror**.
- 3 Select the disk you want to use to create the mirror and click **Add Mirror**.

Removing a Mirror

Removing a mirror from a volume removes or destroys the data from the selected mirror and leaves the other mirror intact. After you remove a mirror, the space on the disk used by the removed mirrored volume becomes unallocated space. The remaining volume becomes a simple volume on the disk.

To remove a mirror, perform the following steps:

- 1 Launch the **Disk Management** utility.
- 2 In the graphical view pane, right-click the volume you want to remove the mirror and click **Remove Mirror**.
- 3 Select the disk you want the mirror removed from and click **Remove Mirror**.

Breaking a Mirror

Breaking a mirror creates two simple volumes with individual drive letters. Each volume contains the data on the mirror at the time the mirror was broken. The data is no longer redundant, but it remains intact.


To break a mirror, perform the following steps:

- 1 Launch the **Disk Management** utility.
- 2 In the graphical view pane, right-click the volume for which you want to break the mirror, and click **Break Mirrored Volume**.

A confirmation message appears.

- 3 Click **Yes** to confirm.

Upgrading Your Operating System

 **NOTICE:** When you upgrade your operating system by following the procedures in this section, only the Windows components will be upgraded. If you upgrade your operating system by booting from the operating system CD, a clean installation will occur and all data will not be preserved.


Operating System Upgrade Paths

Microsoft provides two upgrade paths for your operating system software. Table 4-1 provides the supported upgrade paths for your software.

Table 4-1. Operating System Upgrade Paths

Current Operating System	Supported Upgrade Kit
Microsoft Windows Storage Server 2003 R2 With SP2 x64 Workgroup Edition	Microsoft Windows Storage Server 2003 R2 With SP2 x64 Standard Edition
Microsoft Windows Storage Server 2003 R2 With SP2 x64 Standard Edition	Microsoft Windows Storage Server 2003 R2 With SP2 x64 Enterprise Edition

The terms "Windows Server 2003", "Windows Server 2003 R2", and "Windows Storage Server 2003 R2" may be used interchangeably during the upgrade procedure, within system properties, and in other areas within the operating system. This configuration is as designed by Microsoft. See the COA label or Microsoft Knowledge Base article 915044 located on the Microsoft Support website at support.microsoft.com for information about identifying the Windows operating system edition that is installed on your system.

 **NOTE:** When you upgrade your operating system to another edition (for example, Workgroup Edition to Standard Edition), your system must support both editions. For example, the Dell™ PowerVault™ 100 system supports Windows Storage Server 2003 R2 x64 Workgroup Edition, but the platform does not support the Windows Storage Server 2003 R2 x64 Standard Edition. As a result, you cannot upgrade your system as shown in Table 4-1. See the Platform Support Matrix in the *Important Information* document for details about operating system support for each platform.

Upgrading Your Operating System

Each upgrade kit is shipped with the new operating system media and a new Certificate of Authority (COA) Product Key. Remove the COA label from the upgrade kit and place the label over the existing COA label on your system running Windows Storage Server 2003 R2 With SP2 x64 Edition.

Contact your Dell sales representative to obtain an upgrade kit.

To upgrade your operating system, perform the following steps:

- 1 Turn on your system.
- 2 When prompted, log in to Windows.
- 3 Open an Internet connection to your system.
- 4 Locate the Product Key that is provided with the upgrade kit. This information is required to upgrade your operating system software.



NOTE: The Product Key is located on the lower section of the COA. For more information on the COA, see *Definition of Terms for Microsoft Software Owners* located at www.dell.com/ostechsheets.

- 5 Insert the *Microsoft Windows Storage Server 2003 R2 With SP2 x64 Edition Disk 1* media into the CD/DVD drive.

The media starts automatically and the **Welcome to Setup** window appears.



NOTE: Do not restart your system and boot to the *Windows Storage Server 2003 R2 With SP2 x64 Edition Disk 1* media.


If the media *does not* start automatically:

- a Open Windows Explorer.
 - b Locate the CD/DVD drive.
 - c Right-click the CD/DVD drive and click **AutoPlay**.
- 6 Select one of the following and click **Next**:
 - Install Windows Server[®] 2003, Enterprise Edition
 - Install Windows Server 2003, Standard Edition
 - 7 In the **License Agreement** window, read and accept the license agreement, and click **Next**. If you do not agree with the information, click **Decline**. The system restarts and you are not able to complete the operating system installation.

- 8 In the **Product Key** window, type the 25-character Product Key and click **Next**.

The Product Key is located on the COA label that is attached to your system.

- 9 When prompted, select **Get Updated Setup Files** and click **Next**.

 **NOTE:** This procedure may take several minutes to complete.

Next, your system automatically restarts.

- 10 When prompted, log in to your system as Administrator.

After login, the following message appears:

```
MMC cannot open the file
C:\windows\system32\nas.msc. This may also be
because you do not have sufficient access rights
to the file.
```

This error occurs because the operating system upgrade procedure is not completed. This error will be fixed after you complete the upgrade procedures.

- 11 Click **OK** to continue.
- 12 Remove the *Microsoft Windows Storage Server 2003 R2 With SP2 x64 Edition Disk 1* media from the CD/DVD drive.
- 13 Insert the *Microsoft Windows Storage Server 2003 R2 With SP2 x64 Edition Disk 2* media into the CD/DVD drive.

The media starts automatically and the **Welcome to Microsoft Windows Server 2003 R2** window appears.



If the media *does not* start automatically:

- a Open Windows Explorer.
- b Locate the CD/DVD drive.
- c Right-click the CD/DVD drive and click **AutoPlay**.


- 14 Click **Continue Windows Server 2003 R2 Setup** and click **Next**.

The following message appears:

```
Windows Server 2003 R2 is installed on your
system. To continue and reinstall Windows Server
R2 files, click Yes. To exit Setup, click No.
```

- 15** Click **Yes** to continue.
The **Windows Server 2003 R2 Setup Wizard** window appears.
- 16** Click **Next**.
- 17** In the **Setup Summary** window, click **Next**.
The installation procedure continues, and the Windows Storage Server 2003 x64 R2 With SP2-specific files are copied to your system.
 **NOTE:** This procedure may take several minutes to complete.
- 18** In the **Completing Windows Server 2003 R2 Setup** window, click **Finish**.
- 19** Remove the *Microsoft Windows Storage Server 2003 R2 With SP2 x64 Edition Disk 2* media from the CD/DVD drive.
- 20** When prompted, click **Yes** to restart your system.
- 21** When prompted, log in to your system as Administrator.
The Windows Storage Server 2003 R2 script runs and the Windows Storage Server 2003 R2 With SP2 x64 Edition components are installed and configured on your storage server.
 **NOTE:** This procedure may take several minutes to complete.
The installation procedure is completed.
- 22** Activate your operating system license with Microsoft within 30 days to ensure continued access to the system.
- 23** Close your Internet connection.


Restoring Your Operating System

 **NOTE:** The names Microsoft® Windows Server® 2003, Microsoft Windows Server 2003 R2, Microsoft Windows® Storage Server SP2, and Microsoft Windows Storage Server R2 may be used interchangeably during the installation procedures, in the upgrade process, on the **System Properties** window, and other areas within the operating system. This is as designed by Microsoft. Refer to the Certificate of Authentication (COA) or the Microsoft's Knowledge Base article 915044 at support.microsoft.com to determine the edition of the installed operating system.

You can restore your operating system using one of the following methods:

- Using the *Dell™ Systems Build and Update Utility* media
- Using the operating system media


The following sections provide information about restoring your operating system using these methods.


 **NOTE:** The Remote Desktop Connection feature is not enabled by default in the operating system. This feature must be manually enabled by the user during reinstallation.

Installing Using the Server Management Media

The following technical information explains how to reinstall your Microsoft® Windows Storage Server 2003 R2 x64 Edition with SP2 operating system using the *Dell Systems Build and Update Utility* media.

The *Dell Systems Build and Update Utility* media installs the standard operating system software and the Dell-specific device drivers that are not on the operating system media.

 **NOTICE:** When you reinstall a software redundant array of independent disks (RAID) configuration, both the operating system and data partitions will be erased. When you reinstall a hardware RAID configuration, only the operating system partition will be erased. Dell recommends that you back up your data before you perform this procedure.

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

To perform a clean installation of the operating system, perform the following steps:

- 1 Connect a keyboard, mouse, and monitor to your system.
- 2 Turn on your system.
- 3 Insert the *Dell Systems Build and Update Utility* media into the CD/DVD drive.
- 4 If you are not using the *Dell Systems Build and Update Utility* media for the first time, the **Welcome to Dell OpenManage™ Server Assistant** window appears. Go to step 5.

If you are using the *Dell Systems Build and Update Utility* media on your system for the first time, perform the following steps:

- a When prompted, click the appropriate language for your system.
The **Dell Software License Agreement** window appears. Read the information carefully.
 - b If you agree with all of the information, click **Accept** to continue.
If you *do not* agree with all the information, click **Decline**. Your system restarts, and you are not able to complete the operating system installation.
- 5 Click **Server Setup** to install the operating system.
The **Set the Date and Time** window appears.
- 6 Select the appropriate date, time, and time zone, and click **Continue**.
If your system was configured with software RAID, the **Select Operating System** window appears. Go to step 7.



NOTE: If your system was configured with software RAID, you must reconfigure RAID after you reinstall the operating system using MMC.



NOTE: The software RAID must be reconfigured after you complete the operating system installation procedures. See "Configuring Software RAID" on page 59 for more information.

If a RAID controller is installed on your system, the **Configure or Skip RAID** window appears. Perform the following steps:

a Select one of the following options, and then click **Continue**:

- **Configure RAID**
- **Skip RAID configuration**

If you selected **Skip RAID configuration**, go to step 7.

b If you selected **Configure RAID**, configure the RAID with one of the following options:

- Click **Go to Advanced Wizard** at the top left of the page and follow the prompts.
- Select a RAID level and click **Continue**.

The RAID configuration summary will appear.

c Click **Continue**.

The following message appears:

All existing virtual disk(s) on this controller will be deleted and all data will be lost.

d Click **OK** to continue.

The **Select an Operating System to Install** window appears.

7 Select **Microsoft Windows Server 2003 x64 Edition**. A pop-up window appears with the message:

This version of the Server Administrator has been verified and tested on Microsoft Windows Server 2003 x64 Edition. Server Assistant will only support the installation and configuration of Microsoft Windows Server 2003 x64 Edition.





NOTE: Server Administrator does not provide a separate option for the Windows Storage Server 2003 R2 x64 Edition With SP2 operating system. Selecting **Microsoft Windows Server 2003 x64 Edition** is the correct option.

8 Click **OK**, and then click **Continue**.

The **Configure the Hard Drive for Microsoft** window appears.

9 To set up a new boot partition, select the appropriate file system and size for your partition and click **Continue**.

 **NOTE:** If there is an existing partition on the hard drive, the Confirm to delete partition window appears. Click **Continue**. Server Assistant deletes all existing partitions on the hard drive.

 **NOTE:** For maximum system security, Dell recommends selecting **NTFS-NT File System**.


The **Network Adapter(s) configuration** window appears.


10 Select one of the following options and click **Continue**:

- Obtain IP address from DHCP server.
- Specify an IP address

The **Enter Configuration Information: Microsoft Windows Server 2003 x64 Edition** window appears.

11 Type your system information in the appropriate fields, and click **Continue**.

 **NOTE:** If you leave any field blank, Windows Setup prompts you later for this information.

 **NOTE:** To provide more configuration information, click on the **Advanced** tab in the top-right corner.

The **Operating System Installation Summary** window appears.

12 If the configuration settings are correct, click **Continue**.


The **Microsoft Windows Installation Wizard** window appears and the file copy process starts.

If the configuration settings are not correct, perform the following steps:

- a Click **Back** until the appropriate screen appears.
- b Enter the correct information.
- c Click **Continue** until the **Microsoft Windows Installation Wizard window** appears.


- 13 When prompted, insert the *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 1* media into the CD/DVD drive.

The **Dell OpenManage Server Assistant** automatically detects the media and begins copying the operating system files.

 **NOTE:** This procedure may take several minutes to complete.

- 14 When prompted, remove the *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 1* media from the CD/DVD drive, and click **Finish**.


Your system automatically restarts, Windows Setup appears in text mode, and the installation continues.

 **NOTE:** If Console Redirection is enabled in the System Setup program, you are prompted for an administrator password in the text mode of Windows Setup. Enter an administrator password and press <Enter> to continue. The **Emergency Management System** window appears. Click **OK** to continue.

Windows Setup automatically and restarts your system, and the **Windows Setup** window appears.

Windows Setup completes the installation and restarts your system.

- 15 In the **Log On** window, type your administrator password, and click **OK**.
- 16 When prompted, insert *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 2* media to complete the operating system installation.

 **NOTE:** The installation procedure may take several minutes to complete.


- 17 When the installation is complete, the system automatically reboots.
- 18 When prompted, log in as Administrator.

The Windows Storage Server script starts, requiring no user intervention.

When completed, the system automatically reboots.

The installation procedure is completed.

- 19 Install any additional components, if required. See "Installing Additional Components" on page 46.

 **NOTE:** It is recommended that you download and install any patches, hotfixes, and service packs from the Microsoft Support website at support.microsoft.com.

Installing Additional Components

To install any additional components, perform the following steps:



NOTE: Only supported options will be available for your operating system version.

- 1 Log on as an administrator and click **Start**→**Settings**→**Control Panel**, and then double-click on **Add or Remove Programs**.
- 2 Click on **Add/Remove Windows Components**.
The **Windows Components Wizard** window appears.
- 3 Select the Windows Storage Server 2003 R2 x64 Edition with SP2 components that you want to install.
- 4 Follow the prompts on your screen to complete the installation.

Installing Using the Operating System Media

The following technical information explains how to reinstall Windows Storage Server 2003 R2 x64 Edition With SP2 operating system using the Dell-provided reinstallation media.

Preinstallation Requirements

Listed below are the preinstallation requirements:

- Read the Microsoft *Getting Started* document that is included with your operating system documentation.
- Download the latest BIOS, firmware, and driver updates for the target system from the Dell Support website at support.dell.com.

See *Microsoft Windows Storage Server 2003 x64 Editions With SP2 Important Information* at www.dell.com/ostechsheets for information on the minimum supported BIOS, system firmware, and RAID controller driver versions for R2.

- Create a device driver diskette.

Creating a Device Driver Diskette

If you use the Windows Storage Server 2003 R2 x64 Edition With SP2 media to install the operating system, you must install the latest device drivers located either on the *Dell OpenManage Server Update Utility* media or on the Dell Drivers and Downloads website at support.dell.com/support/downloads.

To determine which devices require drivers, boot your system from the *Dell Systems Build and Update Utility* media. In the **Welcome to Dell OpenManage Server Assistant** window, select **View Hardware**. The devices installed on your system appear on your screen.

To create a device driver diskette, perform the following steps:

- 1** Insert the *Dell OpenManage Server Update Utilities* media into another system running the Windows operating system.

The *Server Update Utilities* media starts automatically.

If the media *does not* start automatically:

- a** Open Windows Explorer.
- b** Locate the CD/DVD drive.
- c** Right-click the CD/DVD drive and click **AutoPlay**.

The **Dell Service and Diagnostic Utilities** window appears.

- 2** In the **Please Select A Server** drop-down menu, select the name of your system.
- 3** In the **Select Drivers/Utilities Set** box, select **System Utilities** and click **Continue**.

The **Utilities and Drivers Page** window appears.

- 4** Click the appropriate file for your operating system.
- 5** Follow the prompts on the screen to download the file.
- 6** Save the self-extracting zip file to the local hard drive and then extract the file to a diskette.
- 7** Close the **Dell Service and Diagnostic Utilities** window.
- 8** Remove the *Service and Diagnostic Utilities* media from the CD/DVD drive.

Installing Using the R2 Reinstallation Media

- 1** Connect a keyboard, monitor, mouse, and any additional peripherals to your system.
- 2** Turn on your system and any attached peripherals.
Several BIOS windows appear during startup, but do not require any user intervention.
- 3** Insert the *Microsoft Windows Server 2003 R2 x64 Edition With SP2 Disk 1* media into the CD/DVD drive.
- 4** Press any key to boot from the media.
If a Windows operating system *is not* installed on your system, the screen turns black. Next, Windows Setup appears in text mode on a blue screen.
- 5** *Immediately* press <F6> if you need to install additional device drivers for the boot device or other devices and perform the following procedure. If you *do not* need to install additional device drivers, go to step 6.
 - a** When prompted, press <S> to select and add any additional devices.
 - b** Insert the device driver diskette into the diskette drive and press <Enter>. A list of device drivers appears.
 - c** Select the appropriate device driver, and press <Enter>. Windows Setup loads the appropriate drivers on your system.
 - d** Verify that Windows loaded the correct device driver on your system.
 - e** Repeat step a through step d to install any additional device drivers. Otherwise, press <Enter> to continue.
A message appears stating that Windows Setup is starting Windows.

- 6 In the **Welcome to Setup** window, press <Enter> to continue.
- 7 If you do not have **Console Redirection** enabled on your system, go to "Running Custom Setup" on page 51.

If **Console Redirection** is enabled on the system, choose one of the following selections:

- **Express Setup** — Automatically configures most of your configuration settings, requiring little or no user intervention.
To run **Express Setup**, press <Enter> and go to "Running Custom Setup" on page 51.
- **Custom Setup** — Allows you to customize your system name and networking components, including TCP/IP and your domain name.
To run **Custom Setup**, press <C> and go to "Running Custom Setup" on page 51.

Running Express Setup

- 1 When prompted from the **Windows Server 2003 Setup** screen, enter the administrator password and press <Enter>.
- 2 When prompted to confirm the password, re-enter the administrator password and press <Enter>.
- 3 If the **Windows Licensing Agreement** window appears, go to step 4.
If the **Windows Licensing Agreement** window *does not* appear, go to step 5.
- 4 Read the information carefully, and if you agree with all of the information, press <F8> to continue. A window appears displaying the existing partitions and unpartitioned space on your system's hard drive.
If you do not agree with the information, press <Esc>. Your system restarts, and Windows is not installed on your system.
- 5 Select an available partition to install the operating system and press <Enter>.
- 6 Select the appropriate file system for your Windows partition, and then press <Enter>.



NOTE: For maximum security, Dell recommends that you format the partition using NTFS.



NOTE: This process may take a few minutes to complete.

- 7 Remove the driver diskette from the diskette drive.

When prompted, *do not* press any key to boot from the media.

Next, the system automatically reboots.

Next, the **EMS Connection Detected** window appears.

- 8 Click **OK** or press <Enter> to continue.

An error message pop-up window may appear, stating that a setup parameter is missing or invalid.

- 9 Click **OK**.



NOTE: The installation media includes the System Locked Preinstallation (SLP) PID. As a result, you are not required to enter a PID during the operating system installation procedures.

Windows Setup completes the installation procedure and restarts your system.



NOTE: This process may take several minutes to complete.

Windows Setup automatically logs you onto your system.

- 10 When prompted, insert the *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 1* media into the CD/DVD drive.

- 11 When prompted, remove the media from the CD/DVD drive, and then click **Finish**.

Your system automatically restarts.

Next, Windows Setup appears in text mode, and the installation procedure continues.




NOTE: If Console Redirection is enabled in the System Setup program, you are prompted for an administrator password in the text mode of Windows Setup. Enter an administrator password and press <Enter> to continue. When the **Emergency Management System** window appears, click **OK** to continue.

Windows Setup automatically restarts your system, and the **Windows Setup** window appears.

Windows Setup completes the installation and restarts your system.

- 12 In the **Log On** window, type your administrator password, and click **OK**.

- 13 When prompted, insert *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 2* media into the CD/DVD drive to complete the operating system installation.

 **NOTE:** The installation procedure may take several minutes to complete.

- 14 When the installation is completed, the system automatically reboots.

- 15 When prompted, log in as Administrator.

The Windows Storage Server script starts, requiring no user intervention.

When completed, the system automatically reboots.


The installation procedure is completed.

Running Custom Setup


- 1 When the **Windows Licensing Agreement** window appears, read the information carefully.

If you agree with all the information, press <F8> to continue. A window appears, displaying the existing partitions and unpartitioned space on your system's hard drive.


If you do not agree with the information, press <Esc>. Your system restarts, and Windows is not installed on your system.

 **NOTE:** If your hard drive is configured with a Windows partition, you may receive an option to repair the partition. Press <Esc> to continue with your new operating system installation.


- 2 Select an available partition to install the operating system and press <Enter>.

 **NOTE:** It is recommended that you create a 12-GB partition at a minimum.

- 3 Select the appropriate file system for the Windows partition, and then press <Enter>.

 **NOTE:** For maximum security, it is recommended that you format the partition using NTFS.

Windows Setup formats your partition with the selected file system and copies the operating system files to your system.

 **NOTE:** This process may take a few minutes to complete.

- 4 Remove any diskette from the diskette drive, and press <Enter> to restart your system.

If you do nothing, Windows Setup automatically restarts the system after 15 seconds.

When prompted, *do not* press any key to boot from the media.

If **Console Redirection** is enabled, the **EMS Connection Detected** window appears. Click **OK** to continue.

The **Windows Setup** window appears and displays the installation progress.

Next, the **Installing Device** window appears, and your screen flashes a few times. This behavior is normal.

Finally, the **Regional and Language Options** window appears.

- 5 Review the displayed default settings.

If the default settings are correct, perform the following steps:

- a Click **Next**.

The **Personalize Your Software** window appears.

- b Go to step 6.

If the default settings are *not* correct, perform the following steps:

- a Click **Customize**.

The **Regional and Language Options** window appears.

- b In the **Regional Options** tab, modify the regional and location settings, if required, and click **OK**.

The **Regional and Language Options** window appears.

- c Click **Details**.

The **Text Services and Input Languages** window appears.

- d In the **Settings** tab, modify the default input language and installed services (if required), click **OK**, and then click **Next** to continue.

The **Personalize Your Software** window appears.

- 6 Type your full name and the name of your company or organization, and click **Next**.


The **Computer Name and Administrative Password** window appears.

- 7 Type your computer name and administrator password, and click **Next**.

The **Date and Time Settings** window appears.


- 8 Set the date, time, and time zone for the system, and click **Next**.

Windows Setup begins installing the network components.

 **NOTE:** This procedure may take several minutes to complete.

The **Networking Settings** window appears.

- 9 Select one of the following settings, and click **Next**:

 **NOTE:** Dell recommends that you select **Typical Settings**.

- **Typical Settings** (default) — Configures your system with the default settings.
- **Custom Settings** (experienced administrators only) — Allows you to configure the following settings in the **Networking Components** window for each network adapter on the system:
 - Client for Microsoft Networks
 - Network Load Balancing
 - File and Printer Sharing for Microsoft Networks
 - Internet Protocol (TCP/IP)

- 10 If you selected **Custom Settings** and need to install additional network components, perform the following steps in the **Networking Components** window:

- a Click **Install**.

The **Select Network Component Type** window appears.

- b Select the type of network component.

- c Click **Add**.

- d Select a network component or network service, and click **OK**.

The **Networking Components** window appears.

11 Click **Next**.

The **Workgroup or Computer Domain** window appears.

12 Select one of the following options:

- **No, this computer is not a network, or is on a network without a domain. Make this computer a member of the following workgroup:**

Requires you to assign a workgroup name to your system. Choosing this selection allows any system on the LAN with the same workgroup name to connect to your system.

Enter a workgroup name, and click **Next**.

- **Yes, make this computer a member of the following domain:**

Enter the appropriate domain name, and click **Next**.

The **Join Computer to <your_domain_name> Domain** window appears. Enter a domain administrator user name and password, and click **OK**.



NOTE: You must have administrator rights to join the domain.

Windows Setup continues the installation procedures, and then restarts your system.



NOTE: This procedure may take several minutes to complete.

The **Welcome to Windows** window appears.

13 Press <Ctrl><Alt><Delete>.


The **Log On to Windows** dialog box appears.

14 Type your administrator password, and click **OK**.

15 When prompted, insert the *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 1* media into the CD/DVD drive.

- 16 When prompted, remove the *Windows Storage Server 2003 R2 x64 Edition With SP2* media from the CD drive, and click **Finish**.


Your system automatically restarts, Windows Setup appears in text mode, and the installation continues.

 **NOTE:** If Console Redirection is enabled in the System Setup program, you are prompted for an administrator password in the text mode of Windows Setup. Enter an administrator password and press <Enter> to continue. The **Emergency Management System** window appears. Click **OK** to continue.

Windows Setup automatically and restarts your system, and the **Windows Setup** window appears.

Windows Setup completes the installation and restarts your system.

- 17 In the **Log On** window, type your administrator password, and click **OK**.
- 18 When prompted, insert *Windows Storage Server 2003 R2 x64 Edition With SP2 Disk 2* media to complete the operating system installation.

 **NOTE:** The installation procedure may take several minutes to complete.

- 19 When the installation is completed, the system will automatically reboot.
- 20 When prompted, log in as Administrator.

The Windows Storage Server script starts, requiring no user intervention.

When completed, the system automatically reboots.

The installation procedure is completed.

For additional information to complete the installation procedures, see the documentation that came with your software or see the Microsoft Support website at support.microsoft.com.

 **NOTE:** Dell recommends that you download and install any patches, hotfixes, and service packs from the Microsoft Support website at support.microsoft.com.

Windows License Activation Requirements



NOTE: During the installation procedure, if you inserted the Product ID using the Certificate of Authority (COA), you must activate your license with Microsoft.

License activation technology is used to help prevent illegal software copies from one system to the next. Dell systems that are pre-installed with the Windows operating system do not require license activation. The need for activation is indicated by an **Active Windows** window and a corresponding icon on the taskbar.

Product activation is required in the following cases:

- If your preinstalled Windows license is overwritten with a new license when reinstalling the Windows Storage Server 2003 R2 x64 Edition operating system using the operating system media kit. The new license requires activation.
- Hardware configuration changes that are substantially different from the original system configuration triggers license reactivation, except when the operating system has been preinstalled by Dell.
- Installing the Windows Storage Server 2003 R2 x64 Edition With SP2 media on a Dell system that has been pre-installed with Windows Server 2003 SP1 or x64 Edition operating systems triggers license reactivation.

When a new license is installed on your system, activation is required. Administrators are reminded at each login and at intervals of 30 days to complete the activation procedure. If license activation does not occur after 30 days, the user is blocked from logging into the system. The system is functional and the services remain active. However, the user must activate the license immediately after logon to continue using the system.

To activate your license, from the Administrator account, double-click the Windows Activation icon on the task bar or run the following command from the **Start**→**Run** window:

```
C:\Windows\system32\oobe\msiobe.exe /a
```

To activate Windows, perform one of the following procedures:

- Activate Windows Using the Internet
- Activate Windows Using the Phone

Activating Windows Using the Internet

- 1 Click **Start**→**Run**.
- 2 In the **Run** window, type the following and press <Enter>:
`C:\Windows\system32\oobe\msoobe.exe /a`.
The **Activate Windows Wizard** window appears.
- 3 Select **Yes, let's activate Windows over the Internet now**, and then click **Next**.
The **Personal Registration** window appears.
- 4 Enter your personal registration information, and then click **Next**.
The wizard establishes a connection with an activation system, and then processes the activation request.

Activating Windows Using the Telephone

- 1 Click **Start**→**Run**.
- 2 In the **Run** window, type
`C:\Windows\system32\oobe\msoobe.exe /a`.
The **Activate Windows Wizard** window appears.
- 3 Select **Yes, I want to telephone a customer service representative to activate Windows**, and then click **Next**.
The system may take a few seconds to generate an installation ID.
- 4 Select the country to display the phone numbers that will be used and call that number.
- 5 Provide the representative on the phone with the installation ID.
The representative will give you a confirmation ID.
- 6 Type the confirmation ID in the required field to complete the activation process.

For more information about Windows license activation and product registration, see the Windows Server 2003 website at www.microsoft.com/windowsserver2003.

Installing and Configuring the Multilanguage User Interface

To reinstall and configure the Multilanguage User Interface (MUI), use the *Multilingual Support* media that are included in your MUI kit.

Each *Multilingual Support* media supports a specific set of languages (listed on each CD label) and includes the following:

- Base operating system installer — Installs MUI support for the Windows Storage Server 2003 R2 x64 Edition With SP2 operating system
- R2 component installer — Installs MUI support for the R2 components.
- Readme.txt file — Includes the latest information about the MUI and important information about the R2 component installer.

The R2 component installer includes an installer for each language, and each installer is identified by a number. Use the **readme.txt** file to identify the correct numbered installer for your particular language(s).

To reinstall the MUI software, perform the following steps:

- 1** Insert the appropriate *Multilingual Support* media for your desired language into the storage server's CD/DVD drive.
- 2** Run the base operating system installer.
 - a** Browse the media and double-click the *.msi file for the language that you wish to install.
 - b** In the **Installer** window, select the languages to be installed, and select the default MUI language from the menu.
 - c** Click **OK** to perform the installation.
 - d** Follow the directions on your screen to complete the installation.
 - e** Reboot your system.
- 3** Repeat step 1 through step 2 for each additional MUI language.

- 4 Run the R2 component installer.
 - a Open the **readme.txt** file and locate the specific installer number for your desired language.
 - b Browse the media and double-click the *_R2.msi file number for the language that you wish to install.
 - c In the **Installer** window, select the R2 components to be installed.
 - d Click **OK** to perform the installation.
 - e Follow the directions on your screen to complete the installation.
 - f Reboot your system.
- 5 Repeat step 4 for each additional MUI language.

Configuring Software RAID

If the operating system is preinstalled on your system, creating a RAID 1 operating system volume is not required.

If you are reinstalling or upgrading the operating system, perform the following steps from the Microsoft Management Console (MMC) to configure a RAID 1 volume for the operating system.

- 1 In the **Windows Storage Server Management** window, expand the **Windows Storage Server Management (Local)** tree.
- 2 Expand **Disk and Volume Management** and click **Disk Management**.
- 3 In the right window pane, right-click **Disk 0** and select **Convert to Dynamic Disk**.
- 4 In the **Convert to Dynamic Disk** window, select the two disks to be mirrored and click **OK**.
- 5 In the **Disks to Convert** window, click **Convert**.
- 6 In the **Disk Management** dialog box, click **Yes** to convert the disks. Both disks are converted to dynamic disks.


Next, the system automatically reboots.

Next, the MMC automatically loads and appears on your screen.

- 7 In the **Windows Storage Server Management** window, expand the **Windows Storage Server Management (Local)** tree.

- 8 Expand **Disk and Volume Management** and click **Disk Management**.
- 9 In the right window in **Disk 0**, right click the C:\ drive and select **Add Mirror**.
- 10 In the **Add Mirror** window, select the disks you want to mirror and click **Add Mirror**.

The mirror synchronizes with the targeted drive.

 **NOTE:** This process may take several minutes to complete, depending on your partition size.

Installing Dell OpenManage Server Administrator

See "Installing Dell OpenManage Server Administrator" on page 18 for information about installing Server Administrator.

Updating Your Microsoft Windows Software

To update your Windows Storage Server 2003 R2 x64 Edition With SP2 operating system, see the Microsoft Support website at support.microsoft.com. All updates to Windows Server 2003 R2 apply to Windows Storage Server 2003 R2 x64 Editions With SP2.

Security Recommendations

Standard Security Recommendations

This section provides information about standard security practices that Dell™ recommends to secure your storage server.

Passwords

The default administrator user name for your storage server is `administrator` and the default password is `storageserver`. Change the default administrator password as soon as possible.

Additionally, Dell recommends the following password practices for your storage server:

- Use passwords that are longer than six characters.
- Do not use blank or simple passwords.
- Do not use dictionary words.
- Do not use personal information such as name, children's names, birth dates, and so forth.
- Use a mix of numerals and upper and lowercase letters. For example, *Rs4326tH*.

Antivirus Software

Dell recommends using an antivirus software on your storage server to protect against viruses.

Microsoft Security Updates

Microsoft® regularly posts security update patches to its website at [microsoft.com](https://www.microsoft.com). Dell recommends that you regularly check to ensure that your storage server has the most recent security update.

Apple Environments

If you are using your storage server in an Apple environment, install the Microsoft User Authentication Module (UAM) on the storage server. If AppleTalk is not installed on the storage server, client access is not encrypted. See “Additional Security Recommendations” for more information.

Secure Socket Layer Certificates

Secure Socket Layer (SSL) certificates enable web servers and users to authenticate each other before establishing a connection to create more secure communications. Certificates contain information used to establish system identities over a network. This identification process is called authentication. Although authentication is similar to conventional forms of identification, certificates enable Web servers and users to authenticate each other before establishing a connection to create more secure communications. Certificates also contain encryption values or keys, that are used in establishing an SSL connection between the client and server. Information, such as a credit card number, sent over this connection is encrypted so that it cannot be intercepted and used by unauthorized parties. Two types of certificates are used in SSL, and each type has its own format and purpose:

- Client certificates — Contain personal information about the clients requesting access to your site, which allows you to positively identify them before allowing them access to the site.
- Server certificates — Contain information about the server, which allows the client to positively identify the server before sharing sensitive information.

Server Certificates

To activate your Web server's SSL 3.0 security features, you must obtain and install a valid server certificate. Server certificates are digital identifications containing information about your Web server and the organization sponsoring the server's Web content. A server certificate enables users to authenticate your server, check the validity of Web content, and establish a secure connection. The server certificate also contains a public key, which is used in creating a secure connection between the client and server.

The success of a server certificate as a means of identification depends on whether the user trusts the validity of information contained in the certificate. For example, a user logging on to your company's website might be hesitant to provide credit card information, despite having viewed the contents of your company's server certificate. This might be especially true if your company is new and not well known.

For this reason, certificates are sometimes issued and endorsed by a mutually trusted, third-party organization, called a Certification Authority. The certification authority's primary responsibility is confirming the identity of those seeking a certificate, thus ensuring the validity of the identification information contained in the certificate.

Alternatively, depending on your organization's relationship with its website users, you can issue your own server certificates. For example, in the case of a large corporate intranet handling employee payroll and benefits information, corporate management might decide to maintain a certificate server and assume responsibility for validating identification information and issuing server certificates.

Microsoft Baseline Security Analyzer

Use the Microsoft Baseline Security Analyzer (MBSA) to search for any security vulnerabilities. MBSA scans Windows-based servers for common security misconfigurations. The tool scans the operating system and other installed components, such as Internet Information Services (IIS). MBSA also checks systems for missing security patches, and recommends critical security patches and fixes.

Additional Security Recommendations

In addition to the practices mentioned in "Standard Security Recommendations," Dell recommends the following practices to ensure security:

- Format all volumes as NTFS.
- Disable automatic log on.
- Disable the guest account.
- Do not install IIS sample applications.
- Disable parent paths.
- Move the Microsoft Active Directory Connector and scripts virtual directories from the default website to another location.


Ensure that you place appropriate restrictions on any Anonymous Logon groups. To allow UNIX® users who do not have Windows user accounts to access resources on a system running Windows, you must explicitly add the Anonymous Logon group to the Everyone group and assign the Anonymous Group appropriate permissions.

Maximum Security Recommendations


This section provides information about practices recommended for maximum security on your storage server.

- Allow no more than two administrators on the storage server.
- Do not allow passwords that have no expiration date.
- Enable Logon Success and Logon Failure auditing.
- Disable unnecessary services.
- Disabling unnecessary services also increases performance.
- Remove the IISADMPWD virtual directory.
- Enable application logging options for all web and FTP sites.
- Ensure that Internet Explorer zones have secure settings for all users.
- Use the storage server only for shares and services that are actively used.
- Disable http sharing if http shares are not used.

Other Documents You May Need

 **CAUTION:** The *Product Information Guide* provides important safety and regulatory information. Warranty information may be included within this document or as a separate document.

- The *Rack Installation Guide* or Rack Installation Instructions included with your rack solution describes how to install your system into a rack.
- The *Getting Started Guide* provides an overview of initially setting up your system.
- The system's *User's Guide* provides information about system features and technical specifications.
- The *Important Information* document provides the minimum hardware and software requirements and all known issues.
- Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- Operating system documentation describes how to install (if necessary), configure, and use the operating system software.
- Documentation for any components you purchased separately provides information to configure and install these options.
- Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

 **NOTE:** Always read the updates first because they often supersede information in other documents.

- Release notes or readme files may be included to provide last-minute updates to the system or documentation or advanced technical reference material intended for experienced users or technicians.

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