

Dell™ PowerVault™ 735N Systems Service Manual

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Preface: Dell™ PowerVault™ 735N Systems Service Manual

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Read This First

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of IBM®-compatible systems/computers and prior training in IBM-compatible systems/computers troubleshooting techniques. In addition to information provided in this manual and in the *Dell PowerVault 735N Systems User's Guide* that came with the system, Dell provides the *Dell PowerVault 735N Systems Installation and Troubleshooting Guide* for troubleshooting procedures and instructions on using Dell Diagnostics to test the computer system.

The sections are summarized as follows:

- "[System Overview](#)" — Overview of the system's service features and technical specifications.
 - "[Basic Troubleshooting](#)" — Initial checks and procedures used to solve basic system problems and information on more detailed service and troubleshooting procedures to solve more complex problems.
 - "[Codes and Error Messages](#)" — POST beep codes, system messages, PERC 2/DC beep codes, system codes, warning messages, diagnostics messages, alert log messages, and SCSI hard-disk drive indicator codes.
 - "[Removing and Replacing Parts](#)" — Removal and replacement of all field-replaceable parts, including DIMMs, microprocessors, expansion cards, and SCSI devices.
 - "[Jumpers, Switches, and Connectors](#)" — Jumper or switch settings to change when troubleshooting and servicing the system.
 - "[Using the System Setup Program](#)" — Using the System Setup program to change the system configuration information stored in NVRAM on the system board.
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Notes, Notices, Cautions, and Warnings

Throughout this manual, there may be blocks of text printed in bold type or in italic type. These blocks are notes, notices, cautions, and warnings and they are used as follows:



NOTE: A NOTE indicates important information that helps you make better use of the system.

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

 **CAUTION:** A CAUTION indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

 **WARNING:** A WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious bodily injury.

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System Overview: Dell™ PowerVault™ 735N Systems Service Manual

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Overview

The Dell PowerVault 735N is an easy-to-install midrange network attached storage (NAS) appliance that is optimized to provide platform-independent storage resources to multiple servers and clients in a mixed networked environment. The system installs directly to an existing local area network (LAN) without disrupting other servers and requires no additional server or client software. The system uses the Microsoft® Windows® Powered operating system and provides support for the Windows Active Directory. Additional features include Dell ActiveArchive™ for system directory snapshots and support for Windows, UNIX®, Novell® NetWare®, and Apple network clients.

The system also provides support for the following components and technologies:

- Redundant array of independent disks (RAID) technology
- Multiple LAN adapters
- Disk hot-swapping
- Hot spare disks
- Advanced small computer serial interface (SCSI) hard-disk drives
- Self-monitoring and report tool (SMART) (monitors the system for hard-disk drive failures)
- File encryption
- File compression

Dell ActiveArchive is a snapshot utility that allows you to create up to 250 scheduled or unscheduled snapshots of the entire file system. You can recover deleted files and/or entire directories without accessing your most recent full or incremental backup, which minimizes the time and effort necessary to recover accidentally deleted files. Unlike conventional volumes where the data can change every second, snapshots record an electronic "picture" of the data for a specific moment in time. Each snapshot is mounted as a volume on the file system and can be scheduled through the Web user interface (UI). Once created, a snapshot appears as a directory on the original volume. If the file system is damaged or corrupted, the system administrator can access the snapshot directory on the root directory of each volume and restore the file system as needed.

Storage resource management is managed and monitored through the PowerVault 735N NAS Manager, a customized Web UI. Using a compatible Web browser, the system can be managed remotely from any client computer attached to the network running the Windows operating system. Because the system uses the Windows Powered operating system that is based on the same code base as Microsoft Windows 2000, any remote management methods available on the Windows 2000 platform can also be used to manage the system.



NOTE: The Windows Powered operating system installed in the PowerVault 735N is dedicated to file server operations. Consequently, the PowerVault 735N cannot be used in the following capacities:

- Primary Domain Controller (PDC)
- Windows Internet Naming Service (WINS) server
- Dynamic Host Configuration Protocol (DHCP) server
- Domain Name System (DNS) server
- Microsoft Exchange Server
- Simple Query Language (SQL) server
- Network Information Service (NIS) server

The system includes an onboard PowerEdge™ Expandable RAID Controller 2/dual channel (PERC 2/DC) card installed in PCI slot 1. For additional storage, up to three optional PowerVault 210S storage systems can be attached to the system using an additional PERC 2/DC card (optional) installed in peripheral component interconnect (PCI) slot 2. The system can be attached to 10/100 or Gigabit networks, depending on the PCI adapter(s) installed in the system.

The following sections describe the major system and servicing features of the PowerVault 735N NAS Appliance, as well as the added security features built into the system.

System Features

The storage appliance offers the following major features:

- One or two Intel® Pentium® III microprocessors with an internal operating frequency of at least 866 MHz.
- Front side bus with an external bus speed of 133 MHz.
- Two types of configurations: one processor with 512 MB of system memory or two processors with 1 GB of system memory. Both configurations use registered SDRAM DIMMs in the DIMM sockets on the system board.
- A flash BIOS that can be upgraded if required.
- Up to five 1-inch hot-pluggable SCSI hard-disk drives.
- A power supply distribution board to accommodate up to two independent power supplies.
- A single, 1.44-MB 3.5-inch diskette drive.
- A 24X CD-ROM drive.

The system board includes the following features:

- Three full-length PCI slots, located in a removable expansion-card cage.
- An integrated video graphics array (VGA)-compatible video subsystem with an ATI RAGE IIC video controller. This video subsystem contains 4 MB synchronous dynamic random access memory

(SDRAM) video memory (nonupgradable). Maximum resolution is 1600 x 1200 with 256 colors (noninterlaced).



NOTE: Video components are used for diagnostic purposes only.

- An integrated National Semiconductor PC97317 super I/O controller that controls the bi-directional parallel port, two serial ports, keyboard, mouse, and the diskette drive.



NOTE: The parallel port is not supported.

- An integrated Intel 82559 10/100 network interface controller (NIC), providing an Ethernet interface.
- A two-channel PERC 2/DC mounted on a PCI card in PCI slot 1 that supports RAID levels 0, 1, 5, 10, and 50.
 - [Channel A \(internal channel\)](#) supports five 1-inch internal SCSI hard-disk drives using a SCSI backplane board. The SCSI backplane board automatically configures the SCSI ID numbers and SCSI termination on each hard drive, which simplifies drive installation.
 - [Channel B \(external channel\)](#) supports an optional PowerVault 210S external SCSI enclosure.
- An integrated Adaptec AIC-7899 Ultra3 SCSI host adapter (not used in this system)
- Integrated server management circuitry that monitors cooling system fan operation as well as critical system voltages and temperatures.
- System board support for the Dell OpenManage™ Remote Assistant when the optional Dell OpenManage Remote Assistant Card 2 (DRAC 2) is installed, providing additional local and remote server management.
- A PS/2-style keyboard port, dual USB ports, and a PS/2-compatible mouse port.



NOTE: The keyboard and mouse are used for diagnostic purposes only.

The following software is included with the system:

- The [System Setup program](#) for quickly viewing and changing the system configuration information.
- Diagnostics for evaluating the system's components and devices.



NOTE: For information on using the system diagnostics, see "[Running the Dell Diagnostics](#)."

Service Features

The storage system includes the following service features to make troubleshooting and repair easy and effective, in most cases without tools or service aids:

- [Dell Diagnostics](#), which checks the system's hardware and all major system components without any additional equipment and without destroying any data (if the system can boot)
- Embedded server management hardware, which monitors temperatures and voltages throughout the

system and notifies you if the system overheats, if a system cooling fan malfunctions, or if a power supply fails

- Redundant, hot-pluggable power supplies
- Redundant, hot-pluggable RAID hard-disk drives

The system chassis design simplifies removing and replacing system components. You can replace microprocessors or DIMMs without removing the system board. The Dell-designed SCSI backplane board and hard-disk drive carriers eliminate the extensive cabling and hard-disk drive configuration usually required for a SCSI subsystem.

Security Features

The storage system also provides the following security features:

- Security support for Windows 2000 Active Directory, Windows NT® Domain and Novell Directory Services (NDS)
- Chassis intrusion sensor that generates an event to the event log when the chassis is opened
- System status light that changes to amber while chassis is open
- Built-in chassis lock that prohibits unwanted users from accessing the inside of the chassis

Technical Specifications

Processor

Microprocessor type	one or two Intel Pentium III microprocessors with an internal operating frequency of at least 866 MHz and an external operating frequency of 133 MHz
Front side bus	133 MHz
Internal cache	internal to microprocessor
Math coprocessor	internal to microprocessor

Expansion Bus

Bus types	32 bit/33Mhz PCI bus
Expansion slots	three full-length dedicated PCI slots: PCI1 through PCI3 PCI1: On-board two-channel PERC 2/DC RAID controller

PCI2: Optional slot for NIC, additional PERC 2/DC, DRAC 2, or high voltage differential (HVD)/low voltage differential (LVD) SCSI card for tape backup

PCI3: Optional slot for NIC (recommended)

Memory

DIMM sockets	four 72-bit wide, 168-pin sockets
DIMM capacities	256-MB registered PC133 SDRAM DIMMs (must be certified for 133-MHz operation)
Minimum RAM	512 MB (with one Pentium III processor) 1 GB (with two Pentium III processors)
Maximum RAM (using 256 MB registered SDRAM DIMMs)	512 MB (with one Pentium III processor) 1 GB (with two Pentium III processors)
External cache	none

Controllers

Network Interface Controller (NIC)	<p>one on-board Intel 10/100 BaseT with support for the following NICs:</p> <ul style="list-style-type: none"> • Intel 10/100 • Intel 10/100S • Intel Dual 10/100 • Intel 10/100/1000 Optical Gigabit • Alteon 10/100/1000 Copper Gigabit
Small Computer Serial Interface (SCSI)	one on-board Adaptec 7899 LVD (not used)
Redundant Array of Independent Disks (RAID)	<p>one PERC 2/DC in PCI 1</p> <p>Channel A (internal channel) reserved for a RAID 0 group for the operating system, a RAID 5 group for a data volume, and Dell ActiveArchive files</p> <p>Channel B (external channel) reserved for an optional PowerVault 210S storage system with a 12 drive bay disk array enclosure (DAE)</p>

Drives

Diskette drive	3.5-inch, 1.44-MB diskette drive included with standard system
SCSI hard-disk drives	five 36 GB hard drives operating system drive (SCSI ID 0) on Channel A of the PERC 2/DC RAID controller in its own RAID 0 group with a hidden cache file, header file, and index file to enable Dell ActiveArchive technology data volume (SCSI ID 1-4) on Channel A of the PERC 2/DC RAID controller in its own four-drive RAID 5 group
SCSI devices	internal SCSI backplane board provides a physical connection, hot-plug capability, termination, and automatic configuration for up to five internal SCSI hard-disk drives integrated Adaptec AIC-7899 Ultra3/LVD (U160) SCSI host adapter (not used)
CD-ROM drive	24X IDE CD-ROM drive included with standard system. The system is capable of booting from the CD-ROM.

External Ports and Connectors

Serial	two 9-pin connectors
Parallel (bi-directional)	25-pin connector (not supported)
Video	15-pin connector
PS/2-style keyboard	six-pin mini-DIN connector
PS/2-compatible mouse	six-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors
Ethernet	RJ45 connector for connection to internal embedded NIC (Intel 82559 10/100 Ethernet controller)

Video

Video type	ATI RAGE IIC PCI video controller; VGA connector
Video memory	4-MB SDRAM standard (not upgradeable)

Power

Two hot-pluggable DC power supplies:

Wattage	330 W (each power supply)
Heat dissipation	1824 BTU/hr (maximum)
Input voltage	100 to 240 V at 50-60 Hz autoranging
Output voltages and maximum current	+5 VDC at 35 A +3.3 VDC at 10 A +12 VDC at 18 A -12 VDC at 0.8 A -5 VDC at 0.3 A +5 Vfp (volts flea power) at 1.2 A
Backup battery	3-V CR2032 lithium coin cell

Physical

Rack mount (2U):

Height	8.4 cm (3.3 inches)
Width	42.4 cm (16.7 inches)
Depth	66.8 cm (26.3 inches)
Weight	15.87 kg (35.0 lb) minimum configuration 24.94 kg (55.0 lb) maximum configuration

Environmental

Temperature:

Operating	10°C to 35°C (50°F to 95°F)
Storage	-40°C to 65°C (-40°F to 149°F)

Relative humidity:

Operating	8% to 80% (noncondensing) 10% per hour gradient
Storage	5% to 95% (noncondensing)

Maximum vibration:

Operating	0.25 G (half-sine wave) at a sweep of 3 to 200 Hz for 15 minutes
Storage	0.5 G at 3 to 200 Hz for 15 minutes

Maximum shock:

Operating	six consecutive shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the
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system) at 41 G for 2 milliseconds

Storage
(non-operational)

six consecutive shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) at 71 G for 2 milliseconds

Altitude:

Operating

–16 to 3048 m (–50 to 10,000 ft)

Storage

–16 to 10,600 m (–50 to 35,000 ft)

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Basic Troubleshooting: Dell™ PowerVault™ 735N Systems Service Manual

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- [External Visual Inspection](#)
- [Common Troubleshooting Issues](#)
- [Observing the Boot Routine](#)
- [Using the Dell PowerVault 735N NAS Manager Web UI \(User Interface\)](#)
- [Using the Dell OpenManage DRAC 2 Console Redirection Service](#)
- [Internal Visual Inspection](#)
- [Running the System Diagnostics](#)
- [Getting Help](#)

Overview

This section describes basic troubleshooting procedures that can help you diagnose a problem with your PowerVault 735N system. These procedures can often reveal the source of a problem or indicate the correct starting point for servicing the system.



NOTES: For a brief explanation of how to load and start the system diagnostics, see "[Running the System Diagnostics](#)."

Dell recommends that you perform the following procedures in the order presented.

Before You Begin

To avoid losing data during problem troubleshooting and resolution, Dell recommends that you back up your system files before troubleshooting the problem with your PowerVault 735N system using conventional backup methods, such as a tape drive.

In the event that the Windows® Powered operating system becomes inoperable, you can use the *Dell PowerVault 735N Systems Reinstallation* CD to reinstall the operating system. Once you have reinstalled the operating system, the system configuration information can be restored if a system state backup is available.



*NOTE: For more information on backing up your system files and recovering from a system failure, see "System Recovery, Backup, and Restore" in the *Dell PowerVault 735N Systems System Administrator's Guide*.*

Determining the Problem

The PowerVault 735N NAS appliance is designed for operation in a headless environment—meaning that during normal operation the system does not require a keyboard, monitor, and mouse. In some situations when you will need to troubleshoot the system, you must install these components onto your system to read system error messages and check additional functions and settings on your system. Be sure to have these components ready, as some of the procedures in the following sections will require you to read and enter system information.

When you first discover a problem with your system, define the problem and the conditions when the problem occurred. Once you have this information, follow the procedures below. They will lead you through the necessary checks and procedures that will help you solve basic system problems. These procedures will also direct you to the appropriate section for detailed troubleshooting information to solve more complex problems.

The following steps will lead you to the section that provides the troubleshooting procedures related to your problem:



NOTES: *If your system is operating erratically, back up the files on your hard-disk drives before performing the following steps.*

See the System Administrator's Guide or the documentation for your backup software for information about backing up your data.

1. If the problem is related to a hardware component, see the section, "[External Visual Inspection](#)." This section will lead you through a quick check of all the switches, controls, and cable connections.
2. If you are not sure if the problem relates to hardware or software, see the section, "[Common Troubleshooting Issues](#)." This section will lead you through the necessary checks and procedures that will help you solve basic system problems.

External Visual Inspection

Basic system problems may be caused by improperly set switches or controls, and loose or improperly connected cables. A quick check of these components and connections can easily solve these problems.

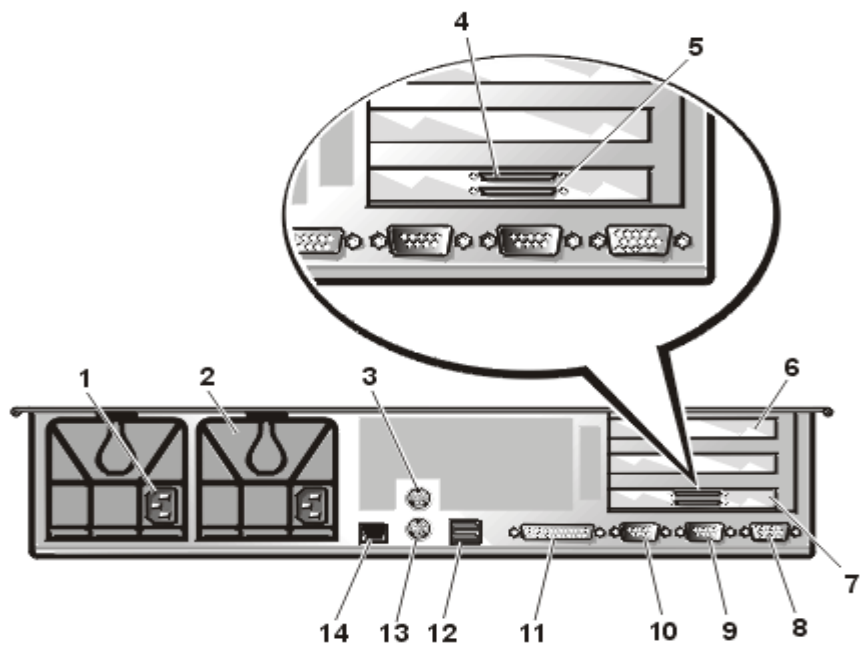
The following subsections provide a visual inspection of the PowerVault 735N storage system and the optional attached PowerVault 210S storage system.

PowerVault 735N Visual Inspection

[Figure 1](#) shows the back-panel connections and [Figure 2](#) shows the front-panel controls and indicators for the PowerVault 735N storage system.

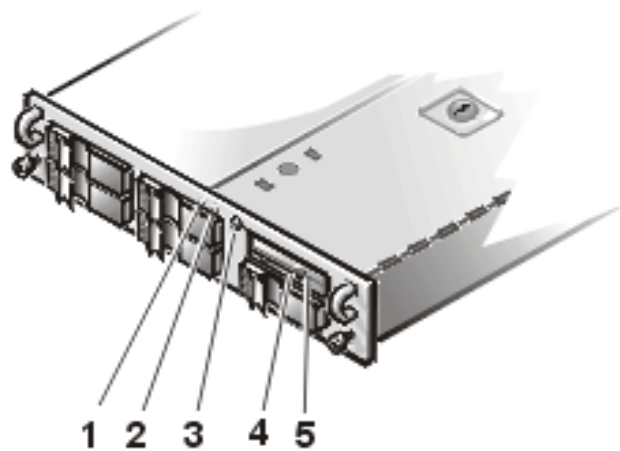
Figure 1. Back-Panel Features of the PowerVault 735N

- 1 AC power receptacle
- 2 Redundant power supplies
(2)



- 3** Mouse connector
- 4** PERC 2/DC Channel A connector (internal channel)
- 5** PERC 2/DC Channel B connector (external channel)
- 6** Expansion slots (2)
- 7** PERC 2/DC
- 8** Video connector (not used during normal operation)
- 9** Serial port 1 connector (administration port)
- 10** Serial port 2 connector (UPS port)
- 11** Parallel port connector (not supported)
- 12** USB connectors (2)
- 13** Keyboard connector
- 14** NIC connector

Figure 2. Front-Panel Features of the PowerVault 735N Storage System



- 1** Hard-disk drive activity indicator
- 2** System status indicator
- 3** Power button and power indicator
- 4** Diskette drive
- 5** CD-ROM drive

PowerVault 210S System Visual Inspection (Optional)

The PowerVault 735N storage system configuration can be expanded to include up to three PowerVault 210S storage systems connected to the system using an optional PERC 2/DC RAID adapter installed in the PCI 2 slot.

[Figure 3](#) shows the back-panel features, [Figure 4](#) shows the back-panel warning indicators, and [Figure 5](#) shows the front panel controls and indicators for the attached PowerVault 210S storage system (optional).

Figure 3. Back Panel Features of the PowerVault 210S Storage System (Optional)

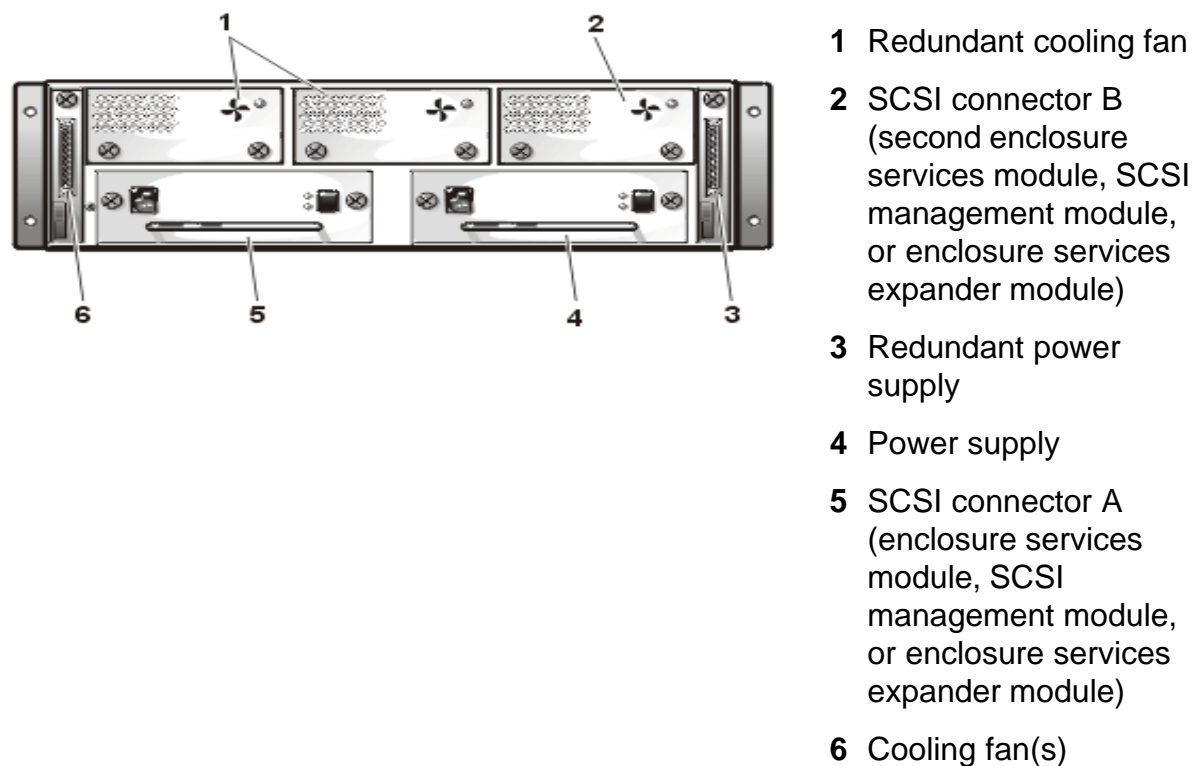
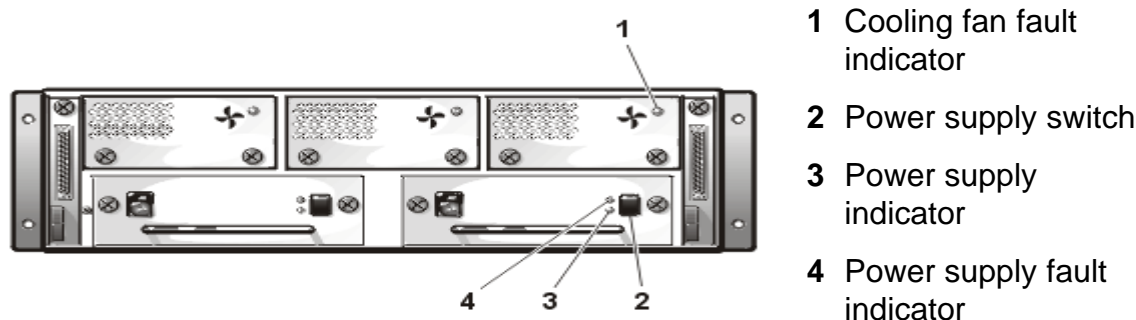





Figure 4. Back Panel Warning Indicators for the PowerVault 210S Storage System (Optional)



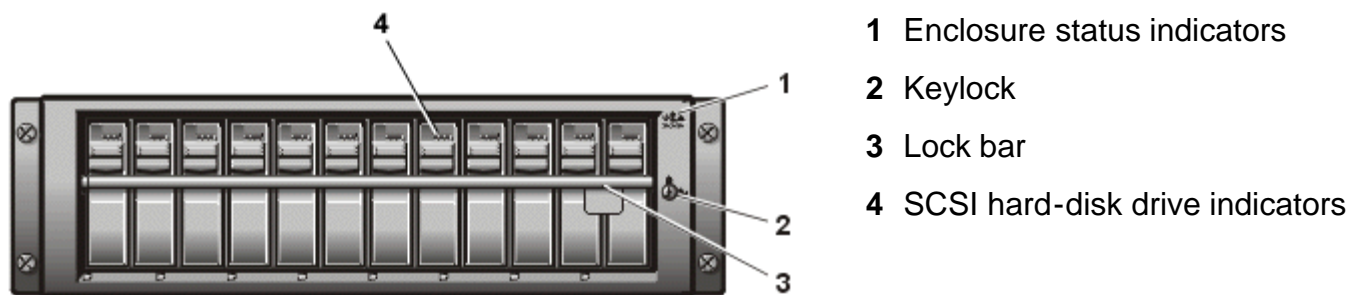
The following indicators are located on the back panel of the PowerVault 210S storage system (see [Figure 4](#)):

- The amber *cooling fan fault indicator*  lights if a fault is detected in a cooling fan.
- The green *power supply indicator*  lights when the storage system is turned on.
- The amber *power supply fault indicator*  lights if one of the storage system's internal self-tests fails



during system start-up or whenever a fault is detected.

Figure 5. Front Panel Features of the PowerVault 210S Storage System (Optional)



- 1 Enclosure status indicators
- 2 Keylock
- 3 Lock bar
- 4 SCSI hard-disk drive indicators



NOTE: For information on installing, configuring, and troubleshooting the PowerVault 210S system, see the *Dell PowerVault 200S, 201S, 210S, and 211S Storage Systems Installation and Service Guide*.

The external visual inspection consists of a quick inspection of the exterior of the system, power and status indicators and any peripheral cables. While performing the visual inspection, make any needed corrections.

To perform the external visual inspection, perform the following steps:

1. Turn off the system and all peripherals.
2. Verify that all power cables are properly connected to the system and their power sources.
3. Verify that the network cables are properly attached.
4. Verify that all devices attached to the serial connectors are properly connected.
5. Inspect the exterior of the system, including all controls, indicators and all user-accessible data storage devices for physical damage.

Did your inspection reveal any problems?

Yes. Proceed to the appropriate procedure in "[Removing and Replacing Parts](#)."

No. Proceed to step 6.

6. Press and hold the power button to power on the system.
7. Check the [power indicator](#) on the front of the system.

Is the power indicator lit?

Yes. Proceed to step 8.

No. Plug the power strip into another electrical outlet, use another power strip, and/or try another electrical outlet.

8. What color is the [power indicator](#)?

Green. The system is receiving DC power. Proceed to step 9.

Blinking Green. A system failure is detected. Check the event logs in the PowerVault 735N NAS Manager.



NOTE: For more information on event logs, see the *PowerVault 735N Systems System Administrator's Guide*.

Amber. The system is in "Sleep" mode. Disable the Sleep mode using the [System Setup program](#).

9. Check the [power supply LEDs](#) on the back of the system. What color are the LEDs?

Green. Power supply is OK. Proceed to step 10.

Red. Replace the defective power supply.

10. Check the [system status indicator](#) on the front of the system. What color is it?

Steady Green. The system is receiving DC power. Proceed to step 11.

Blinking Green. A system failure is detected. Check the event logs using the PowerVault 735N NAS Manager.

Amber. The chassis is open or the system is in "Sleep" mode. [Close the system doors](#) (if open) or disable the Sleep mode using the [System Setup program](#).

11. Check the [hard-disk drive indicator](#) for each hard-disk on the front of the system. What color is it?

Green. The hard-disk drives are OK. Proceed to [Common Troubleshooting Issues](#).

Blinking Green. The hard-disk drives are in use. This indication is normal.

Amber. Replace the defective hard-disk drive(s).

Common Troubleshooting Issues

This section provides a table of common problems with the system, their possible causes, and resolutions. Review the issues in [Table 1](#) to see if any of them match the problem you are having with the system.

Table 1: Common Troubleshooting Issues.

Issue	Possible Cause	Resolution
I cannot access my Dell	Only Windows common internet file	Access Dell ActiveArchive folders

ActiveArchive™ from an NFS or Macintosh client.	system (CIFS) clients can access the snapshots stored in the Dell ActiveArchive folders for each volume.	through the Windows client to perform data recovery.
I cannot take a snapshot of my volume.	A snapshot cannot be taken of the volume containing the snapshot cache file.	The cache file is located on the C: drive. Taking a snapshot of the C: drive is not supported.
I have deleted a volume and created a new one. Now, I cannot take a snapshot of the new volume.	When a volume is deleted, a new one is created, and both volumes have the same drive letter, snapshots are not active for the new volume until the system has been rebooted.	Reboot the system. After the reboot, snapshots should work correctly for the new volume.
I created a new basic volume but cannot take a snapshot of the volume.	After creating a basic volume, the system must be rebooted before a snapshot can be taken.	Upgrade the volume to dynamic or reboot the system. After the upgrade or reboot, you should be able to create a snapshot.
XCOPY does not run on a share I have created in the root of a volume on my system.	Since Dell ActiveArchive is enabled, XCOPY does not read the snapshots on a volume.	When Dell ActiveArchive is enabled, only use XCOPY on folders and shares other than the root directory of a volume.
I cannot create shares for NetWare® or Macintosh clients in PowerVault NAS manager.	NetWare and Macintosh Shares can only be set up from the Advanced Administration Menu .	Create new shares using the Terminal Services Advanced Client. To do this, perform the following steps: 1. Select Terminal Services Advanced Client from the PowerVault 735N NAS Manager Maintenance menu. 2. Select Shares Management from the Advanced Administration Menu .
I have just created an HTTP share and cannot browse the directories.	Directory Browsing is not selected by default for shares that were originally created through the Advanced Administration Menu (NetWare and Macintosh) and are now being used for HTTP sharing.	Select Directory Browsing using the Terminal Services Advanced Client. To do this, perform the following steps: 1. In the NAS Manager Maintenance menu, select Terminal Services Advanced Client . 2. Exit the Advanced Administration Menu . 3. On the desktop, double-click

		<p>My Appliance.</p> <ol style="list-style-type: none"> 4. Browse through the folders and locate the shared HTTP folder (Web sharing). 5. Select the check box next to Directory Browsing.
I have just deleted a volume in Dell OpenManage™ Array Manager and now I am unable to view my shares in NAS Manager.	In the event that a volume with shares is deleted, NAS Manager does not display any shares until the shares that were directed to the deleted volume are removed.	<p>Remove the shares from the deleted volume. To do this, perform the following steps:</p> <ol style="list-style-type: none"> 1. Use the Terminal Services Advanced Client to remove the shares for the deleted volume. 2. Exit NAS Manager and restart. The shares should be visible.
In the PowerVault NAS Manager, I have been modifying many shares in a short period of time. Now, I noticed that one of my shares is listed twice or a share I've created is not listed.	Microsoft Internet Explorer stores previous versions of pages in its cache. When that cache reaches a limit, it might start to misreport the data being sent to the Shares option in NAS Manager. This situation can only happen if you are using the sharing function in a short time period.	Close Microsoft Internet Explorer and restart, or disable page caching in Internet Explorer.
I have just added an HTTP share but cannot see it from the PowerVault NAS Manager.	For security purposes, directory browsing is not enabled by default on an HTTP share directed to the same folder or volume as another share.	<p>Enable directory sharing for an HTTP share. To do this, perform the following steps:</p> <ol style="list-style-type: none"> 1. Open the PowerVault NAS Manager. 2. Click Maintenance. 3. Click Terminal Services Advanced Client. 4. Enter your user name and password. 5. Click OK. 6. Modify the folder's Web sharing properties.
I am getting event errors for Services for Macintosh .	Services for Macintosh are bound to the onboard network interface controller (NIC) by default. If the NIC has been disabled, binding errors will	Bind the Services for Macintosh to an enabled NIC. To do this, perform the following steps:

	occur.	<ol style="list-style-type: none"> 1. Start the PowerVault 735N NAS Manager. 2. Click on Maintenance. 3. Enter your user name and password. 4. On the desktop, click on Advanced Administration menu icon. 2. Select System Settings—> Network Properties. 3. Check the onboard NIC. If the NIC is disabled, bind Services for Macintosh to an enabled NIC.
I have just finished using the PowerVault Kick-Start utility. After rebooting my system, the system shuts down and powers off.	You left the PowerVault Kick-Start diskette in the diskette drive.	Remove the diskette from the diskette drive and power on the system.
I configured the system using the Kick-Start utility. Now, I cannot access the NAS Manager using Microsoft Internet Explorer.	The system may not be connected to the network.	<ol style="list-style-type: none"> 1. Make sure the system is connected to the network. 2. Make sure you entered a correct IP address in the Kick-Start Application Menu. 3. If the problem persists, use the serial port as described in the System Setup Placemat to access the NAS Manager and ensure that the configuration settings are correct.
I connected the network cable but forgot to insert the Kick-Start diskette before I powered on the system. Can I still configure my system with Kick-Start?	No. When Kick-Start booted up it did not find a Kick-Start diskette or a system running DHCP to obtain an IP address. Microsoft Windows Advanced Server assigned your system an Autoconfiguration IP address.	Use the serial port as outlined in the <i>System Setup Placemat</i> or the <i>User's Guide</i> .
From a Macintosh client, users cannot modify or delete a file previously accessed by a Windows client.	The time is not properly synchronized between clients and the system.	Make sure that the clients' systems are synchronized within ten minutes relative to the time zone.
I just created a new volume on my system but I cannot see	Terminal Services will not update the system when a new volume is	Exit from Terminal Services and reconnect. The volume should now

the volume on Windows Explorer through Terminal Services.	created during the current session.	be visible.
Every time I try to do a directory listing from an NFS client on the root of a system volume, I get an error message that usually states "Permission Denied."	The problem is caused by the System Volume Information directory, which is created by Microsoft Index Server. The NFS service cannot access this directory, and returns an error to the client when they try to list its properties. This problem only occurs when sharing the root of a drive letter.	Ignore this error. By default, the System Volume Information directory is not used by the NFS clients or your system.
I cannot add a user with the name "User", "User1", and so on.	Due to security reasons, the system does not support generic user accounts.	Do not create generic user accounts beginning with "User."
I have just changed the system IP address and now I cannot administrate the system through the PowerVault NAS Manager.	Even though you configured the system with a new IP address, your local host is still trying to communicate with the system using the old IP address.	Close Microsoft Internet Explorer and restart the PowerVault NAS Manager.
In PowerVault NAS Manager, I clicked OK and then Cancel and the NAS Manager locked up.	Cancel will not dynamically stop a system update after choosing OK . It allows the system administrator to cancel an operation before confirming it.	If an operation has been performed in error, the system administrator must manually reset the setting.
I see the following error message in the event log: "WMI ADAP was unable to load the winspool.drv performance library due to an unknown problem within the library: 0x0."	This error is an issue with the WDAP Performance library and is documented on Microsoft's Web site.	<ol style="list-style-type: none"> 1. Connect to the system via Terminal Services Advanced Client and open a local command prompt. 2. Enter the following: "WINMGMT/CLEARADAP" . 3. When the prompt returns, enter: "WINMGMT/RESYNCPERF winmgmt service PID."
I cannot change the default Welcome and exit message for FTP shares	The default welcome and exit messages for FTP can only be modified through the Terminal Services Advanced Client.	Connect to the system via Terminal Services Advanced Client and make the appropriate changes through the Microsoft Management Console .
When I am in Dell OpenManage Array Manager, right-clicking on a volume and selecting Explore causes the Advanced Administration	The Terminal Services session had a problem launching the Windows Explorer console.	When the error appears on the screen, close the Advanced Administration Menu and open Windows Explorer.

<p>Menu to appear and display the following error:</p> <pre>/e,/idlist, :0:2628,C:\</pre>		
<p>The Dell OpenManage Array Manager event log size is not working properly.</p>	<p>The Dell OpenManage Array Manager event log has grown past its size limit.</p>	<p>Periodically clear the Dell OpenManage Array Manager event log by clicking the Event tab and selecting Clear all Events.</p>
<p>I have noticed that my Dell OpenManage Array Manager Log file has exceeded its maximum log size.</p>	<p>The maximum log file size was exceeded because the notification message cannot be seen and cleared through Terminal Services or NAS Manager.</p>	<p>Periodically clear the Dell OpenManage Array Manager event log by clicking the Event tab and selecting Clear all Events.</p>
<p>I have tried logging on to my Dell OpenManage Remote Assistant Card 2 (DRAC 2) through the Web console and I cannot log on. I configured my DRAC 2 using the PowerVault Advanced Administration Menu and I can ping the IP address I assigned the card.</p>	<p>There are spaces before or after the user name or password entries.</p>	<p>Reedit the configuration file to ensure there are no spaces before or after any of the user or password entries.</p>
<p>After receiving my system, I attached a keyboard, monitor, and mouse directly to my system, but I did not connect the network cable. When I turn on the power and my system boots up, I see the system log on, open a DOS shell, run some scripts, and log off the session.</p>	<ul style="list-style-type: none"> - The network cable is not connected from the router to the NIC as shown in the System Setup Placemat document. - The system is not configured using the recommended steps in the System Setup Placemat document. - The system is looking for a valid IP address, not finding one, and then logging off. 	<ol style="list-style-type: none"> 1. Use one of the three methods documented in the System Setup Placemat to configure your system. If you must attach a keyboard, monitor, and mouse, shut down and power off the machine by pushing and holding the power button on the front panel. 2. Attach a network cable from your router to your NIC, and then power on the system. Microsoft Windows Advanced Server will recognize your network connection and assign an Autoconfiguration IP address. This procedure will allow Kick-Start to run, find a valid IP address, and then disable itself from executing.
<p>I connected the network cable to the router and the system but forgot to insert the PowerVault Kick-Start diskette before I powered on the</p>	<p>When PowerVault Kick-Start booted up, it did not find a PowerVault Kick-Start diskette in the diskette drive or a system running DHCP to obtain an IP address. Consequently, the</p>	<p>Use the administration serial port as outlined in the System Setup Placemat document to configure your system.</p>

system. I used PowerVault Kick-Start to configure my system but I cannot connect to the unit.	operating system assigned your system an Autoconfiguration IP address.	
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After consulting the troubleshooting issues in [Table 1](#), did the issues provide you with an answer to your problem?

Yes. Reconfigure the system as necessary.

No. Proceed to [Observing the Boot Routine](#).

Observing the Boot Routine

After you have performed a visual inspection and reviewed the common troubleshooting issues as described in the previous sections, you should boot the system and, while the system is running, listen to and observe the system for any indication of problems.

When an error occurs during a boot routine, the system may display a system message on the screen or emit a series of beeps, known as a beep code, that identify the problem.

System messages, also known as Power On Self Test (POST) codes, alert you to possible system hardware problems. During the boot-up process, the system will inform you of any hardware problems by displaying system messages on the monitor. Once you have the message, you can troubleshoot the problem using the [System Messages](#) table found later in this manual.

Beep codes use a pattern of sounds to alert you to possible system hardware problems. For example, one beep followed by a second beep followed by three beeps (code 1-1-3) means that the system was unable to read the data in non-volatile random-access memory (NVRAM). Also, if the system emits a three second beep and then a one-second beep, this would indicate a problem with the PERC 2/DC card and the beep code would indicate that a logical drive is offline. In many cases, the [System Beep Codes](#) and [PERC 2/DC Beep Codes](#) tables will lead you to a solution to the problem. However, if you follow the procedures in this troubleshooting section and cannot find a solution to the problem, the beep codes will provide valuable information for the Dell technical support representative if you need to call for technical assistance.



NOTES: *If the system boots without a keyboard, mouse, or monitor attached, the system will not issue beep codes related to these peripherals.*

Most of the steps in this procedure require you to observe system functions and indications, some of which can occur simultaneously. You may need to reboot the system several times to complete all of the steps.

To observe and identify system problems during the boot routine, perform the following steps:

1. Power down the system, attach a keyboard, monitor, and mouse, and then reboot the system.
2. Watch the <Num Lock>, <Caps Lock>, and <Scroll Lock> indicators on the upper-right corner of the keyboard. After all three indicators flash then pause for approximately 30 seconds, the Num Lock indicator should light up and remain on (unless the Num Lock option is set to **Off** in the [System Setup](#)

program.)

Do these indicators flash on and off within approximately 10 seconds after the boot routine starts?

Yes. Proceed to step 3.

No. Troubleshoot the system power supply. If the troubleshooting procedure indicates that the system power supply is operational, troubleshoot the memory.

3. During the boot routine, observe the system for any of the following indications:

- System error messages — See "[System Messages](#)."
- Beep codes — See "[System Beep Codes](#)" and "[PERC 2/DC Beep Codes](#)."
- Diskette-drive and hard-disk drive failure — The [indicators](#) on the front of the hard-disk drive light up in response to data being transferred to or from the hard-disk drives. If either of these indicators fails to light up during the boot routine, troubleshoot the diskette drive or hard-disk drive subsystem, respectively.

Did you fix the problem?

Yes. No further steps are necessary.

No. Proceed to [Using the Dell PowerVault 735N NAS Manager Web UI \(User Interface\)](#).

Using the Dell PowerVault 735N NAS Manager Web UI (User Interface)

The PowerVault 735N NAS Manager is a Web-based user interface that allows you to configure the PowerVault 735N NAS appliance using the Microsoft Internet Explorer Web browser. The interface consists of a list of common management tasks grouped under a set of tabs. The NAS Manager also contains a health/status indicator, providing links to the health summary page, diagnostics page, and monitoring page. The NAS Manager requires Microsoft Internet Explorer Version 5.0 or later.



NOTES: The PowerVault 735N NAS Manager uses external applications, such as the terminal client, that become embedded within the browser via active server pages, or ASP. Since Microsoft Internet Explorer 5.x or later is the only browser with this capability, Netscape Navigator is not supported.

Microsoft Internet Explorer Version 4.0 or greater may be used only with Microsoft Windows NT® 4.0 with Service Pack 4 or greater.

For more information on the PowerVault 735N NAS Manager, see "Dell PowerVault NAS Manager" in the System Administrator's Guide.

To check the event logs in the PowerVault 735N NAS Manager, perform the following steps:

1. Start your Microsoft Internet Explorer Web browser.

2. In the **Address** field, enter one of the following URLs to navigate to the PowerVault 735N NAS Manager Web UI:

- `http://<system_name>:1278`
- `http://<IP_address>:1278`

Can you connect to the PowerVault 735N NAS Manager?

Yes. Proceed to step 3.

No. Proceed to step 6.

3. Did you log on to the NAS Manager using the correct password?



NOTE: The default administrator password is "powervault" in lower caps.

Yes. Proceed to step 4.

No. Re-enter the correct password in the dialog box.

4. In the NAS Manager, click **Maintenance**, and then click **Logs**.

The **Application Log**, **System Log**, and **Security Log** appear.

5. Click on each event log and check for errors.

Were any errors found in the logs?

Yes. Troubleshoot the system and make the appropriate repairs, then repeat step 4.

No. Proceed to step 6.

6. Ping the PowerVault 735N system to verify the connection.

Could you ping the system?

Yes. Use the [DRAC 2 Console Redirection Service](#), if present, to check for a blue screen. If a DRAC 2 is not installed in your system, proceed to step 7.

No. Proceed to step 7.

7. Connect to the PowerVault NAS Manager through the Administration port.

On a computer running Windows 2000, perform the following steps:

- a. Connect the null modem cable included with your system from the configuration system to the [Administration port \(Serial Port 1\)](#) on your PowerVault 735N system.
- b. From the **Start** menu, click **Setting**, and then **Control Panel**.
- c. In the **Control Panel**, click **Phone and Modem Options**.
- d. On the **Modems** tab, click **Add** for the Add/Remove Hardware Wizard.
- e. Click the **Don't detect my modem; I will select it from a list** checkbox and then click **Next**.
- f. In the drop-down menu for **Manufacturers**, click **(Standard Modem Types)**.
- g. In the drop-down menu for **Models**, click **Communications cable between two computers**, and then click **Next**.
- h. Click the **Selected ports** radio button, select the appropriate communication port from the list, and then click **Next**.
- i. Click **Finish** to close the Add/Remove Hardware Wizard, and then click **OK** to close the **Phone and Modem Options dialog box**.
- j. On the desktop, click **My Network Places** and select **Properties**.
- k. In the **Properties** window, double-click **Make New Connection**.

The Network Connection Wizard window appears.

- l. Click **Next**.
- m. Select the radio button for **Connect Directly To Another Computer** and click **Next**.
- n. Select the radio button for **Guest** and click **Next**.
- o. In the drop-down menu, click the COM port that you are using and then click **Next**.
- p. Click **Only for myself** and then click **Next**.
- q. Type the name of the connection and click **Finish**.

After you configure your serial connection, the **Connect Direct Connection** window appears.

- r. Click **Properties**.
- s. Click the **General** tab.
- t. Under **Select a Device**, select **Communication cable between two computers**.
- u. Click **Configure**.

The **Modem Configuration** window appears.

- v. From the **Maximum Speed (bps)** drop-down menu, select **115200**.
- w. Click **OK** to close the **Modem Configuration** window.
- x. Click **OK** to close the **Direct Connection** window.

The **Connect Direct Connection** box prompts you for a user name and password.

- y. Enter the User Name and Password for your system.
- z. Click **Connect**.

This connects the system you are using for configuration.

- aa. Start Microsoft Internet Explorer on the system you are using to configure the PowerVault 735N system.
- ab. Type the name of the PowerVault 735N system.

The PowerVault NAS Manager appears.

8. Does the PowerVault NAS Manager appear on the screen?

Yes. Check the network settings and functionality of the network card. If necessary, restore the network settings from backup.

No. Proceed to step 9.

9. Power down the system, attach a keyboard, monitor and mouse, and reboot the system. As the system boots up, make sure that the system completes the boot process and does not hang during the POST.

Did the system successfully complete the boot process?

Yes. Proceed to step 10.

No. Go to [Getting Help](#).

10. Can you log on to the NAS appliance?

Yes. Perform the following steps:

- a. Start Microsoft Internet Explorer.
- b. In the Address field, type `http://localhost:1278`.

The PowerVault NAS manager appears.

- c. Check the event logs for errors and troubleshoot as necessary.



NOTE: See the online help or the PowerVault 735N Systems System Administrator's Guide for more information on checking the event logs in the NAS Manager.

No. Go to [Getting Help](#).

Using the Dell OpenManage Remote Assistant Card 2 (DRAC 2) Console Redirection Service



NOTE: You must have a DRAC 2 installed in your system to use this feature.

The DRAC 2 Console Redirection Service is an independent software module running on the Windows NT/2000 operating system that allows you to see the remote system's monitor and control its keyboard and mouse. The Redirection Service gives you full control of the system, allowing you to perform any administrative tasks on the system as needed. Using this service, you can perform the following tasks:

- Reboot or shut down the system.
- Watch the boot process.
- View the system's event logs.
- View the system's [POST codes](#).



NOTE: For more information on DRAC 2 software, see the Dell OpenManage Remote Assistant Card Version 2.x User's Guide.

To run the DRAC 2 Console Redirection Service, perform the following steps:

1. Start the DRAC 2 Console Client.

Can you see the Windows Powered desktop?

Yes. You are finished. Reconfigure or troubleshoot the system as necessary.

No. Reconfigure the DRAC 2 card using the terminal services **Advanced Administration Menu**, then proceed to step 2.



NOTE: For more information on reconfiguring your DRAC 2, see the PowerVault 735N Systems System Administrator's Guide.

2. Can you see the Windows Powered desktop now?

Yes. You are finished.

No. Check for any [system beep codes](#), [PERC 2 beep codes](#), or [POST error messages](#). If no problems are found, proceed to [Internal Visual Inspection](#).

3. Is the problem resolved?

Yes. You are finished. Reconfigure or administer the system as necessary.

No. Contact Dell Technical Support. See "[Getting Help](#)" for more information.

Internal Visual Inspection

NOTICE: Before you proceed with the internal visual inspection described in this section, make sure you save all of your open application programs and close them, if possible.

A simple visual inspection of a system's interior hardware can often lead to the source of a problem, such as a loose expansion card, cable connector, or mounting screw. When you perform the visual inspection, see "[System Features](#)" to locate components referenced in the inspection procedure.

To perform the internal visual inspection, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from electrical outlets.



CAUTION: Before beginning to work inside the system, disconnect the power supply from the power source and the power supply cables from the power supply.

2. Open the system's doors as described in "[System Doors](#)."



CAUTION: The SEC cartridge and heat sink assembly can get extremely hot during system operations. Be sure that it has had sufficient time to cool before touching it.



CAUTION: When handling the SEC cartridge and heat sink assembly, take care to avoid sharp edges on the heat sink.

3. Verify that the microprocessor(s), DIMMs, expansion cards, SEC cartridge, and heat sink assembly or assemblies are fully seated in their sockets or connectors.
4. To ensure that the microprocessor(s) are fully seated in their sockets, press firmly on the top of each microprocessor.
5. To remove and reseat an SEC cartridge and heat sink assembly, perform the steps described in "[Removing the SEC Cartridge and Heat Sink Assembly](#)."
6. To remove and reseat a DIMM, perform the steps described in "[DIMMs](#)."
7. If you need to remove and reseat an expansion card, remove the card as described in "[Expansion Cards](#)," and carefully reinsert the card in its connector until fully seated.
8. Verify that all jumpers are set correctly.



NOTE: For information about jumper settings, see "[System Board Jumpers](#)."

9. Check all cable connectors inside the system to verify that they are firmly attached to their appropriate connectors.

10. [Close the system doors.](#)
11. Reconnect the system and any attached peripherals to their power sources, and turn them on.

Does the problem appear to be resolved?

Yes. No further steps are necessary.

No. Go to "[Getting Help.](#)"

Running the System Diagnostics

The system diagnostics helps you check the system's hardware and all major components of the computer system without any additional equipment and without destroying any data. As long as the microprocessor and the input and output components of the system are working properly, you can use the diagnostics to check for a failed component in your system. If you know what component(s) you need to test, select the appropriate tests, as explained below.



NOTES: To run the diagnostics, you must connect a keyboard, monitor, and mouse to the system.

See the [Installation and Troubleshooting Guide](#) for additional troubleshooting information.

To run the tests, you must first create five diagnostics diskettes using the *Dell PowerVault 755N NAS Appliance Resource CD*.

To start the system diagnostics, turn off the system, insert *Diagnostics Diskette #1* into the diskette drive, and then turn on the system. The system will prompt you to insert the remaining diskettes.

Starting the system diagnostics causes the Dell logo screen to appear on the monitor, followed by a message indicating that the diagnostics are loading. Before the diagnostics load, a program tests the portion of main memory (RAM) required for loading the diagnostics. If a RAM error is detected, a message stating which DIMM has failed appears on the screen.

If no errors are found in RAM, the diagnostics load and the **Diagnostics** menu appears. This menu lets you choose the following options or exit the Dell Diagnostics:

- **Run All Tests** — Runs all tests for a thorough check of the system
- **Run Quick Tests** — Runs selected tests from all test groups to quickly locate a failure or to indicate where further testing is needed to isolate a failure
- **Run Specific Tests** — Tests a particular area or subsystem

See "Running Dell Diagnostics" in the system *Installation and Troubleshooting Guide* for more information about the Dell Diagnostics.

Getting Help

If none of the troubleshooting procedures in this section or the tests in the System Diagnostics reveals the source of the problem or leads to the proper troubleshooting steps for determining the source of the problem, go to the Dell Web site at <http://support.dell.com> or call Dell for technical assistance. For instructions on contacting Dell, see "Getting Help" in the *Installation and Troubleshooting Guide*.



NOTE: Before you contact Dell for technical assistance, be sure to list the problems you are having with your system and the troubleshooting measures you have done so far. This list will provide the technician with the information needed to quickly help you solve your problem.

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Codes and Error Messages: Dell™ PowerVault™ 735N Systems Service Manual

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-

Overview

This section describes beep codes and system error messages that can occur during system start-up or, in the case of some failures, during normal system operation. The tables in this section list faults that can cause a beep code or system error message to occur and the probable causes of the fault in each case. This section also suggests actions you can take to resolve problems indicated by a message.

If a faulty system does not emit beep codes or display system error messages to indicate a failure, you should run the appropriate tests in the [Dell Diagnostics](#) to help isolate the source of the problem.


Several different types of messages can indicate when the system is not functioning properly:

- System messages (POST error messages)
 - System beep codes
 - PERC 2/DC beep codes
 - Warning messages
 - Diagnostics messages
 - Alert messages
 - Front panel indicators
 - SCSI hard-disk drive indicator codes
 - Power supply indicators
-

System Messages (POST Error Messages)

System messages, also known as Power On Self Test (POST) error messages, alert you to a possible operating system problem or to a conflict between the software and hardware. [Table 1](#) lists the system error messages that can occur and the probable cause for each message.

If the table does not lead to the source of the problem, run the appropriate tests in the [Dell Diagnostics](#) to assist in troubleshooting the problem.

 **NOTES:** See the section "[Running the Dell Diagnostics](#)" for information on running the Dell Diagnostic tests.

If you receive a system message that is not listed in Table 1, check the documentation for the application program that is running when the message appears and/or the operating system documentation for an explanation of the message and recommended action.

Table 1. System Messages

Message	Cause	Corrective Action
Address mark not found	Faulty diskette/tape drive subsystem or hard-disk drive subsystem (defective system board)	Replace the system board.
Alert! Maximum memory size exceeded. Limiting memory size to 2 GB	System supports up to 2 GB of memory	Remove one or more DIMMs so that total memory is 2 GB or less.
Alert! Uncorrectable memory error previously detected in xxxx xxxx	Improperly seated or faulty DIMMs	Remove and reseal the DIMMs. If the problem persists, replace the DIMMs.
Alert! Single-bit memory error previously detected in xxxx xxxx	Improperly seated or faulty DIMMs	Remove and reseal the DIMMs. If the problem persists, replace the DIMMs.
Alert! Unsupported memory in DIMM slot(s) n.	Unsupported DIMM(s) installed	Replace one or more DIMMs so that all DIMMs are the same type.
Attachment failed to respond	Diskette drive or hard-disk drive controller cannot send data to associated drive	Replace the drive's interface cable. If the problem persists, replace the system board.
Auxiliary device failure	Mouse cable connector loose or improperly connected, defective mouse	Check the mouse cable connection. If the problem persists, replace the mouse.
Bad error-	Faulty diskette/tape drive	Replace the system board.

correction code(ECC) on disk read Controller has failed	subsystem or hard-disk drive subsystem (defective system board)	
CD-ROM drive not found	Improperly connected or missing CD-ROM drive	Check that the diskette drive/CD-ROM drive unit is seated properly against the interposer board on the peripheral cage. See " Drives ."
CPUs with different level 2 cache sizes detected	Two different types of microprocessors are installed	Install a correct version of the microprocessor so both microprocessors have the same level 2 cache size.
Data error	Faulty diskette, diskette drive, or hard-disk drive	Replace the diskette, diskette drive, or hard-disk drive.
Decreasing available memory	One or more DIMMs improperly seated or faulty	Remove and reseat the DIMMs . If the problem persists, replace the DIMMs .
Diskette drive 0 seek failure Diskette drive 1 seek failure	Faulty or improperly inserted diskette, incorrect configuration settings in System Setup program, loose diskette/tape drive interface cable, or loose power cable	Check that the diskette drive/CD-ROM drive unit is properly against the interposer board on the peripheral cage. Run the System Setup program to correct the diskette drive type. See " Using the System Setup Program ." Check the drive interface and power cables.
Diskette read failure	Faulty diskette, faulty or improperly connected diskette/tape drive interface cable, or loose power cable	Check that the diskette drive/CD-ROM drive unit is properly against the interposer board on the peripheral cage. See " Drives ." Replace the diskette-drive interface cable.
Diskette subsystem reset failed	Faulty diskette/tape drive controller (defective system board)	Replace the system board .
Diskette write protected	Diskette write-protect feature activated	Move the write-protect tab on the diskette.
Drive not ready	Diskette missing from or improperly inserted in diskette drive	Reinsert or replace the diskette.
Embedded server management error Embedded server management is not present	Embedded server management memory may be temporarily corrupted	Shut down the system to clear the memory, and then restart the system.
Gate A20 failure	Faulty keyboard controller (defective system board)	Replace the system board .
General failure	Operating system corrupted or not installed properly	Reinstall the operating system.

Hard disk controller failure	Incorrect configuration settings in System Setup program, improperly connected hard-disk drive, faulty hard-disk drive controller subsystem (defective system board), or loose power cable	Check the hard-disk drive configuration settings in the System Setup program . Reinstall the hard-disk drive. Check the interface cable and power cable connections to the backplane board.
Invalid configuration information - please run SETUP program	Incorrect ISA_CLR jumper configuration, incorrect configuration settings in System Setup program, or faulty battery	Remove the plug from the ISA_CLR jumper. See " Jumpers, Switches, and Connectors " for instructions. Check the System Setup configuration settings. Replace the battery. See " Battery ."
Invalid CPU speed detected	Microprocessor not supported by system	Install a correct version of the microprocessor in the specified microprocessor connector.
Invalid NVRAM configuration, resource reallocated	System detected and corrected a resource conflict when system resources were allocated using the Resource Configuration Utility	No action is required.
I/O parity interrupt at address	Expansion card improperly installed or faulty	Reinstall the expansion cards (see " Expansion Cards "). If the problem persists, replace the expansion card.
Keyboard controller failure	Defective keyboard/mouse controller (defective system board)	Replace the system board.
Keyboard failure	Keyboard cable connector loose or improperly connected, defective keyboard, or defective keyboard/mouse controller (defective system board)	Check the keyboard cable connection. Replace the keyboard. If the problem persists, replace the system board.
Keyboard data line failure Keyboard stuck key failure	Keyboard cable connector loose or improperly connected, defective keyboard, or defective keyboard/mouse controller (defective system board)	Check the keyboard cable connection. Replace the keyboard. If the problem persists, replace the system board.
Memory address line failure at address, read value expecting value	Faulty or improperly seated DIMMs or defective system board	Remove and reseat the DIMMs. If the problem persists, replace the DIMMs. If the problem still persists, replace the system board.

Memory double word logic failure at <i>address</i> , read <i>value</i> expecting <i>value</i>		
Memory odd/even logic failure at <i>address</i> , read <i>value</i> expecting <i>value</i>		
Memory write/read failure at <i>address</i> , read <i>value</i> expecting <i>value</i>		
Memory allocation error	Faulty application	Restart the application.
Memory parity interrupt at <i>address</i>	Improperly seated or faulty DIMMs	Remove and reseal the DIMMs . If the problem persists, replace the DIMMs .
Memory tests terminated by keystroke	POST memory test terminated by pressing the spacebar	No action is required.
No boot device available	Faulty diskette, diskette/tape drive subsystem, hard-disk drive, hard-disk drive subsystem, or no boot disk in drive A	If booting from a diskette, ensure the diskette is bootable. If booting from a hard-disk drive, replace the hard-disk drive. If the problem persists, replace the system board .
No boot sector on hard-disk drive	Incorrect configuration settings in System Setup program, or no operating system on hard-disk drive	Verify the hard-disk drive System Setup information is correct. Install an operating system on the hard-disk drive.
No timer tick interrupt	Defective system board	Replace the system board .
Non-system disk or disk error	Faulty diskette, diskette/tape drive subsystem, or hard-disk drive subsystem	Ensure the diskette is a bootable diskette. If booting from a hard-disk drive, ensure the hard-disk drive is formatted and contains an operating system. Replace the system board .
Not a boot diskette	No operating system on diskette	Use a bootable diskette.
Processor or terminator card not installed!	No microprocessor or terminator card installed in secondary microprocessor	Install a terminator card or microprocessor in the secondary microprocessor connector. See " Microprocessors " for instructions.

	connector	
Read fault Requested sector not found	Faulty diskette, diskette/tape drive subsystem, or hard-disk drive subsystem (defective system board)	Replace the diskette or hard-disk drive. If the problem persists, replace the system board .
Reset failed	Improperly connected diskette/tape drive, hard-disk drive, or power cable	Check that the diskette drive/CD-ROM drive unit is properly against the interposer board on the peripheral cage. See " Drives ." Replace the diskette/tape drive interface cable. Reinstall the hard-disk drive. Check the interface cable and power cable connections to the backplane board. See " Drives ."
ROM bad checksum = <i>address</i>	Expansion card improperly installed or faulty	Reinstall the expansion cards . If the problem persists, replace the expansion card.
Sector not found	Defective sectors on diskette or hard-disk drive	Replace the diskette or hard-disk drive .
Seek error	Defective sectors on diskette or hard-disk drive	Replace the diskette or hard-disk drive .
Seek operation failed	Faulty diskette or hard-disk drive	Replace the diskette or hard-disk drive .
Shutdown failure	Defective system board	Replace the system board .
System backplane cable error	Improperly attached interface cables	Check the primary and secondary SCSI interface cable connections to the backplane board .
System backplane error	Improperly attached or missing backplane	Check the interface cable connections to the backplane board .
Time-of-day clock stopped	Defective battery or faulty chip (defective system board)	Replace the system battery . If the problem persists, replace the system board .
Time-of-day not set - please run SETUP program	Incorrect Time or Date settings or defective system battery	Check the Time and Date settings. See " Using the System Setup Program " for instructions. If the problem persists, replace the system battery . If the problem still persists, replace the system board .
Timer chip counter 2 failed	Defective system board	Replace the system board .
Unexpected interrupt in protected mode	Improperly seated DIMMs or faulty keyboard/mouse controller chip (defective system board)	Remove and reseal the DIMMs . If the problem persists, replace the DIMMs . If the problem still persists, replace the system board .
Unsupported CPU detected in SLOT <i>n</i>	Microprocessor not supported by system	Install a correct version of the microprocessor in the specified microprocessor connector.

Unsupported CPU speed detected!		
Unsupported CPU speed in CMOS	Microprocessor not supported by BIOS	Upgrade the BIOS. See " Using the System Setup Program " for instructions.
Unsupported DIMM installed in the RAID DIMM slot!	RAID DIMM not supported by system	Install a correct version of the RAID DIMM.
Unsupported RAID key detected!	RAID key not supported by system	Install the RAID hardware key for your specific system.
Utility partition not available	<F10> was pressed during boot, but no utility partition exists on the boot hard-disk drive	Create a utility partition on the boot hard-disk drive.
Warning! Detected mode switch from RAID to SCSI on the onboard RAID channel. Data loss will occur! Press Y to confirm the change; press any other key to cancel.	Type of controller has changed since previous system boot	Back up information on the drives before changing the type of controller used with the hard-disk drives. If <Y> is pressed, this message appears: Press <Y> to verify the change; press any other key to cancel the change.
Write fault Write fault on selected drive	Faulty diskette or hard-disk drive	Replace the diskette or hard-disk drive.

System Beep Codes

When an error that cannot be reported on the monitor occurs during a boot routine, the system may emit a series of beeps that identify the problem. The beep code is a pattern of sounds; for example, one beep followed by a second beep and then a burst of three beeps (code 1-1-3) means that the system was unable to read the data in nonvolatile random-access memory (NVRAM). This information is valuable to the Dell technical support representative if you need to call for technical assistance.

When a beep code is emitted, record it and then look it up in [Table 2](#). If you are unable to resolve the problem by looking up the meaning of the beep code, use the [Dell Diagnostics](#) to identify a more serious cause.

Table 2. System Beep Codes

Code	Cause	Corrective Action
1-1-3	CMOS write/read failure	Replace the system board.

1-1-4	BIOS checksum failure	Reflash the BIOS firmware. If the problem persists, replace the system board .
1-2-1	Programmable interval-timer failure	Replace the system board .
1-2-2	DMA initialization failure	
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	Remove and reseal the DIMMs . If the problem persists, replace one or more DIMMs . If the problem still persists, replace the system board .
1-3-2	No memory installed	Remove and reseal the DIMMs . If the problem persists, replace the DIMMs . If the problem still persists, replace the system board .
1-3-3	Chip or data line failure in the first 64 KB of main memory	Remove and reseal the DIMMs . If the problem persists, replace the DIMMs . If the problem still persists, replace the system board .
1-3-4	Odd/even logic failure in the first 64 KB of main memory	
1-4-1	Address line failure in the first 64 KB of main memory	
1-4-2	Parity failure in the first 64 KB of main memory	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	
3-1-2	Master DMA-register failure	
3-1-3	Master DMA-register failure	

3-1-4	Master interrupt-mask register failure Slave interrupt-mask register failure	
3-2-4	Keyboard-controller test failure	Check the keyboard cable and connector for proper connection. If the problem persists, run the keyboard test in the Dell Diagnostics to determine whether the keyboard or keyboard controller is faulty. If the keyboard controller is faulty, replace the system board .
3-3-1	CMOS failure	Run the system board test in the Dell Diagnostics to isolate the problem.
3-3-2	System configuration check failure	Replace the system board .
3-3-3	Keyboard controller not detected	Replace the system board .
3-3-4 3-4-2 3-4-3	Screen initialization failure Screen-retrace test failure Search for video ROM failure	Run the video tests in the Dell Diagnostics .
4-2-1 4-2-2	No timer tick Shutdown failure	Replace the system board .
4-2-3	Gate A20 failure	Replace the system board .
4-2-4	Unexpected interrupt in protected mode	Ensure that all expansion cards are properly seated, and then reboot the system.
4-3-1	Improperly seated or faulty DIMMs	Remove and reseal the DIMMs . If the problem persists, replace the DIMMs . If the problem still persists, replace the system board .
4-3-3	Defective system board	Replace the system board .
4-3-4	Time-of-day clock stopped	Replace the battery . If the problem persists, replace the system board .

4-4-1	Super I/O chip failure (defective system board)	Replace the system board.
4-4-2	Parallel-port test failure (defective system board)	Replace the system board.
4-4-3	Math coprocessor failure (defective microprocessor)	Remove and reseat the specified microprocessor . If the problem still persists, replace the microprocessor.
4-4-4	Cache test failure (defective microprocessor)	Remove and reseat the specified microprocessor . If the problem still persists, replace the microprocessor.

Table 3. PERC 2/DC Beep Codes

Tone Pattern	Meaning	Examples
Three seconds on and one second off	A logical drive is offline	One or more drives in a RAID 0 configuration failed.
One second on and one second off	A logical drive is running in degraded mode.	One drive in a RAID 5 configuration failed.
One second on and three seconds off	An automatically initiated rebuild has been completed.	While you were away from the system, a hard-disk drive in a RAID 1 or 5 configuration failed and was rebuilt.

Warning Messages

A warning message alerts you to a possible problem and asks you to take corrective action before the system continues a task. For example, before you format a diskette, a message may warn you that you may lose all data on the diskette, as a way to protect against inadvertently erasing or writing over the data. These warning messages usually interrupt the procedure and require you to respond by typing *y* (yes) or *n* (no).



NOTE: Warning messages are generated by either the application program or the operating system. See your *Installation and Troubleshooting Guide* and the documentation that accompanied the operating system and application program for more information on warning messages.

Diagnostics Messages

When you run a test group or subtest in the Dell Diagnostics, an error message may result. These particular error messages are not covered in this section. Record the message on a copy of the Diagnostics Checklist, and then follow the instructions in that section for obtaining technical assistance.

Alert Log Messages From the Dell OpenManage™ Server Agent

The Dell OpenManage Server Agent server management software generates alert messages that appear in the Simple Network Management Protocol (SNMP) trap log file. Alert messages consist of information, status, warning, and failure messages for drive, temperature, fan, and power conditions. To see the trap logs from the NAS Manager **Maintenance** page, go to the **Logs** page or to **Terminal Services** to log onto your server and use the **Event Viewer** under **Computer Management** to view any logged events.

Front Panel Indicators

The following indicators are on the system's front panel (see [Figure 1](#)):

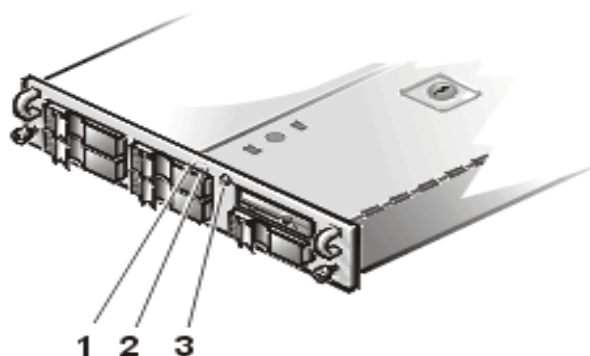
- The power light/button on the front panel controls the AC power input to the system's power supplies. The indicator lights green when the system is receiving DC power.

When the system is in sleep mode the power indicator is amber.

The green system status indicator blinks amber when a system failure is detected.

- The green hard-disk drive activity indicator flashes whenever the hard-disk drives are in use.

Figure 1. Front Panel Indicators



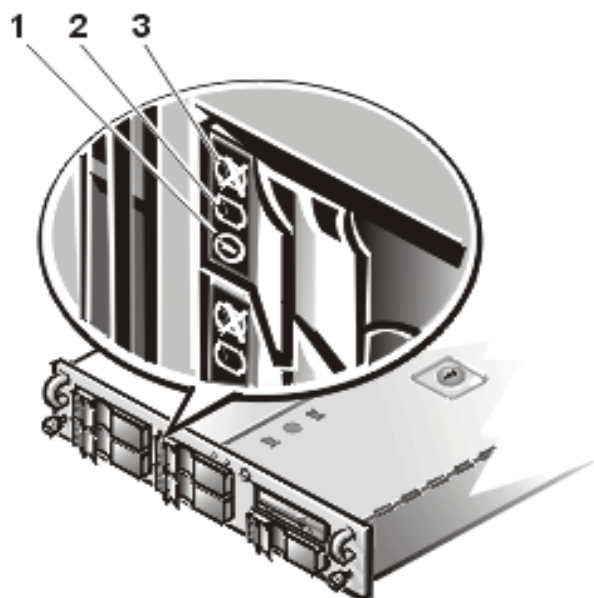
- 1 Drive activity indicator
- 2 System status indicator
- 3 Power button/indicator

SCSI Hard-Disk Drive Indicator Codes

Three light-emitting diode (LED) indicators on each of the hard-disk drive carriers provide information on the status of the SCSI hard-disk drives (see [Figure 2](#)). The SCSI backplane firmware controls the drive online and drive failure indicators.

Figure 2. Hard-Disk Drive Indicators

- 1 Drive online indicator
- 2 Drive activity indicator
- 3 Drive failure indicator



[Table 4](#) lists the drive indicator patterns established by the SCSI backplane firmware. Different patterns are displayed as drive events occur in the system. For example, in the event of a hard-disk drive failure, the "drive failed" pattern appears. After the drive is selected for removal, the "drive being prepared for removal" pattern appears, followed by the "drive ready for insertion or removal" pattern. After the replacement drive is installed, the "drive being prepared for operation" pattern appears, followed by the "drive online" pattern.

Table 4. SCSI Hard-Disk Drive Indicator Patterns

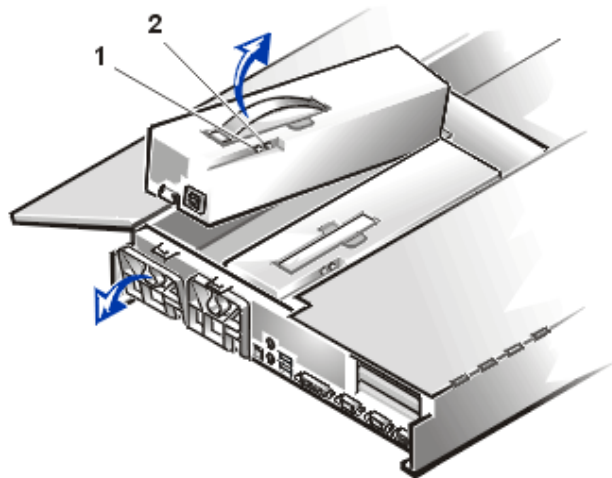
Condition	Indicator Code
Identify drive	All three drive status indicators blink simultaneously.
Drive being prepared for removal	The three drive status indicators flash sequentially.
Drive ready for insertion or removal	All three drive status indicators are off.
Drive being prepared for operation	The drive online indicator is on. The drive activity light may flash briefly.
Drive bay empty	All three drive status indicators are off.
Drive predicted failure	The drive online indicator is on. The drive failure indicator blinks on briefly each second.
Drive failed	The drive online indicator turns off. The drive failure indicator blinks off briefly each second.
Drive rebuilding	The drive online indicator blinks rapidly.
Drive online	The drive online indicator is on.
Drive active or in use	The drive activity indicator is flashing.

Power Supply Indicators

The system top doors must be opened to observe the power supply status indicators. Your system may have one or two power supplies. Each power supply has two LED indicators on the top back (see Figure 3):

- The red (front) failure indicator lights when a fault has occurred and the power supply needs replacing.
- The green (back) power indicator lights when the system is on and the power supply is operating properly.

Figure 3. Power Supply Status Indicators



- 1 Power indicator
- 2 Failure indicator

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Overview

[System Board](#)

This section provides servicing procedures for components inside the system. Before you start any of the procedures in this section, perform the following tasks:

- Perform the procedures described in "[External Visual Inspection](#)."
- Read the safety instructions in "[Safety First—For You and Your System](#)."

Recommended Tools


You need the following items to perform the procedures in this section:


- *PowerVault 735N Systems User's Guide*
- *PowerVault 735N Systems Installation and Troubleshooting Guide*
- Key to the system keylock
- #1 and #2 Phillips screwdriver
- 1/4-inch nut driver, preferably with magnetic insert tip
- Wrist grounding strap as explained in "[Protecting Against Electrostatic Discharge](#)"

Safety First—For You and Your System

The procedures in this guide require that you remove the cover and work inside the computer. While working inside the computer, do not attempt to service the computer except as explained in this guide and elsewhere in Dell documentation. Always follow the instructions closely.

Working inside the computer is safe—if you observe the following precautions.

 **WARNING: This system may have more than one power supply cable. To reduce the risk of electrical shock, a trained service technician must disconnect all power supply cables before servicing the system.**

 **WARNING: The power supplies in your computer system may produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the computer covers and access any of the components inside the computer.**

 **WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT**

Before starting to work on the computer, perform the following steps in the sequence listed:


1. Turn off your computer and any devices.
2. Ground yourself by touching an unpainted metal surface on the chassis, such as the metal around the card-slot openings at the back of the computer, before touching anything inside your computer.

While you work, periodically touch an unpainted metal surface on the computer chassis to dissipate any static electricity that might harm internal components.


3. Disconnect your computer and devices from their power sources. Also, disconnect any telephone or telecommunication lines from the computer.

Precautions for Rack-Mountable Products

Observe the following precautions for rack stability and safety. Also refer to the rack installation documentation accompanying the system and the rack for specific warning and/or caution statements and procedures.

 **WARNING: Installing Dell system components in a Dell rack without the front and side stabilizers installed could cause the rack to tip over, potentially resulting in bodily injury under certain circumstances. Therefore, always install the stabilizers before installing components in the rack.**

After installing system components in a rack, never pull more than one component out of the rack on its slide assemblies at one time. The weight of more than one extended component could cause the rack to tip over and injure someone.

 *NOTE: Dell's server and storage systems are certified as components for use in Dell's rack cabinet using the Dell customer rack kit. The final installation of Dell systems and rack kits in any other brand of rack cabinet has not been approved by any safety agencies. It is the customer's responsibility to have the final combination of Dell systems and rack kits for use in other brands of rack cabinets evaluated for suitability by a certified safety agency.*

- System rack kits are intended to be installed in a Dell rack by trained service technicians. If you install the kit in any other rack, be sure that the rack meets the specifications of the American National Standards Institute (ANSI)/Electronic Industries Association (EIA) standard ANSI/EIA-310-D-92, International Electrotechnical Commission (IEC) 297, and Deutsche Industrie Norm (DIN) 41494. One rack kit is required for each PowerEdge™ computer system that is installed in a rack.
- Do not move large racks by yourself. Due to the height and weight of the rack, Dell recommends a minimum of two people to accomplish this task.
- Before working on the rack, make sure that the stabilizer feet are secure to the rack, extend to the floor, and that the full weight of the rack rests on the floor. Install front and side stabilizer feet on a single rack or front stabilizer feet for joined multiple racks before working on the rack.
- Always load the rack from the bottom up, and load the heaviest item in the rack first.
- Make sure that the rack is level and stable before extending a component from the rack.
- Extend only one component at a time from the rack.
- Use caution when pressing the component rail release latches and sliding a component into or out of a rack; the slide rails can pinch your fingers.
- After a component is inserted into the rack, carefully extend the rail into a locking position, and then slide the component into the rack.

- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating.
 - Ensure that proper airflow is provided to components in the rack.
 - Do not step on or stand on any system or component when servicing other systems or components in a rack.
-

Protecting Against Electrostatic Discharge

Static electricity can harm delicate components inside your computer. To prevent static damage, discharge static electricity from your body before you touch any of your computer's electronic components, such as the microprocessor. You can do so by wearing a wrist strap when working inside the computer, or, if a wrist strap is not available, by touching an unpainted metal surface on the computer chassis to discharge any static charge from your body.

As you continue to work inside the computer, periodically touch an unpainted metal surface to remove any static charge your body may have accumulated.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- Wear a wrist grounding strap, and clip it to any unpainted metal surface on the computer chassis.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the antistatic packing material until you are ready to install the component in your computer. Just before unwrapping the antistatic packaging, be sure to discharge static electricity from your body.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.

The following notice may appear throughout this document to remind you of these precautions:

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

In addition, Dell recommends that you periodically review the safety instructions for this system as defined in the *Installation and Troubleshooting Guide*.

System Doors

The system has two doors on the top of the system that provide access to the system board and expansion cards. The doors interlock so that the keylock on the right-side door secures both doors.

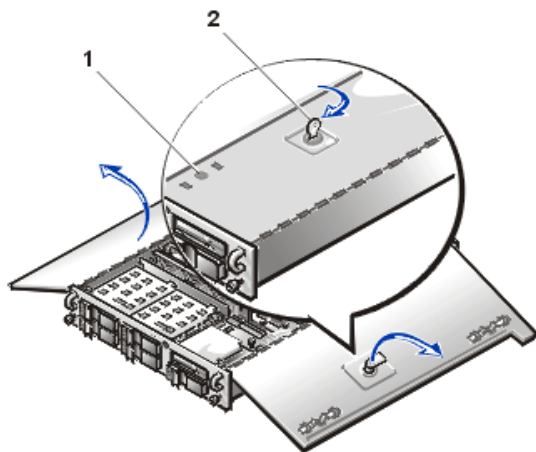
NOTICE: To prevent your system from overheating, make sure the SCSI cables do not block the cooling fans.

Opening the System Doors

[Figure 1](#) shows how to open the system doors and provides the location of the latches and keylock.

Figure 1. Opening the System Doors

- 1 Latches (2)
- 2 Keylock



To open the system top doors, perform the following steps:



CAUTION: See "[Safety First—For You and Your Computer](#)" before working inside your system.

1. Slide the system out of the rack.
2. [Remove the optional front bezel](#) (if present) if you need to access the hard-disk drives.
3. Using the system key, turn the keylock on the top of the chassis clockwise to the unlocked position (see [Figure 1](#)).
4. Slide the two door latches to release the right door.
5. Lift the right door.
6. Lift the left door.

Closing the System Doors

To close the top doors, perform the following steps:

1. Close the left door.
2. Close the right door so that it overlays the left door and slide the finger latches until they snap into the locked position.
3. Rotate the system key counter-clockwise in the keylock to lock the top doors (see [Figure 1](#)).

Optional System Bezel

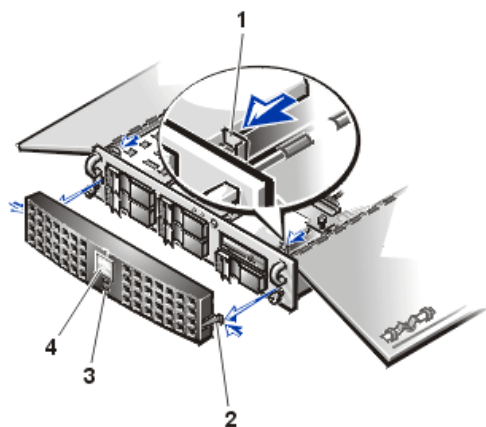
To remove the optional front bezel of the system, perform the following steps:



CAUTION: See "[Safety First—For You and Your Computer](#)" before working inside your system.

1. Unlock and open the system doors (see the previous section, "[Opening the System Doors](#)").
2. Pivot the top of the two locking levers toward the back of the chassis (see [Figure 2](#)).
3. Press the tab on each end of the bezel and remove the bezel from the chassis (see [Figure 2](#)).

Figure 2. Optional Front Bezel Removal



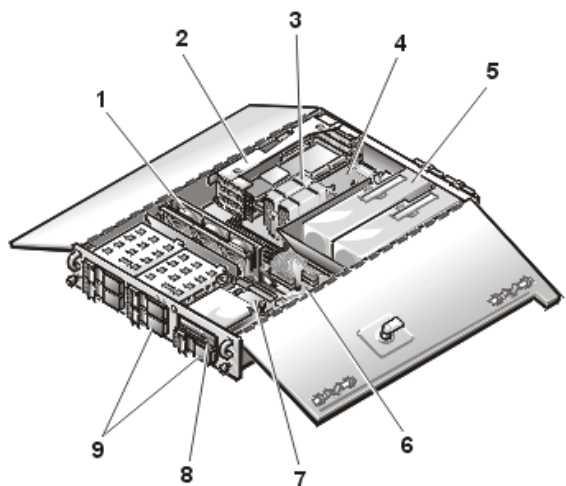
- 2 Tabs (2)
- 3 Status indicators (2)
- 4 Dell nameplate

NOTICE: When replacing the optional front bezel, ensure that the bezel is oriented so that its status indicators are positioned just below the Dell nameplate in the center of the bezel.

Inside the Chassis

In Figure 3, the system doors are opened to provide an interior view. Figure 3 also identifies the drive bays. Refer to these illustrations to locate interior features and components discussed later in this manual.

Figure 3. Inside the System (Right-Side View)



- 1 Cooling fans (3)
- 2 Expansion-card cage
- 3 Microprocessors
- 4 System board
- 5 Redundant power supply (2)
- 6 Power supply distribution board
- 7 Interposer board
- 8 Diskette drive/CD-ROM drive unit
- 9 Hard disk drive bays (5)

The system board holds the system's control circuitry, microprocessors, and other electronic components. Several hardware options such as the microprocessors and memory are installed directly on the system board. The expansion-card cage accommodates up to three full-length PCI expansion cards. Slot 1 has a PowerEdge Redundant Array of Independent Disks (RAID) controller 2/Dual Channel (PERC 2/DC) card. The two peripheral bays provide space for a 3.5 inch diskette drive, CD-ROM drive, and a fifth small computer serial interface (SCSI) hard drive.

The hard-disk drive bays provide space for up to five 1-inch SCSI hard-disk drives. These hard-disk drives are connected to the PERC 2/DC host adapter via the SCSI backplane board.

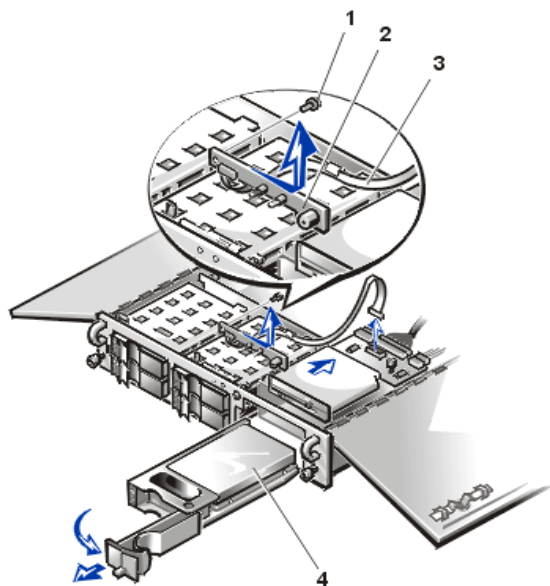
The power cables leading from the power supply distribution board (PSDB) and interposer board provide power to the system board, SCSI backplane board, and drives in the peripheral bays.

For non-SCSI drives such as the diskette drive and the CD-ROM drive, an interface cable connects each drive to the interposer board or to an expansion card.

During a service procedure, you may be required to change a jumper or switch setting. For information on the system board jumpers, see "[Jumpers, Switches, and Connectors.](#)"

Control Panel Assembly

Figure 4. Control Panel Assembly Removal



- 1 Screw
- 2 Control panel
- 3 Control panel cable
- 4 Fifth hard drive (SCSI ID 4)

To remove the control panel assembly, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

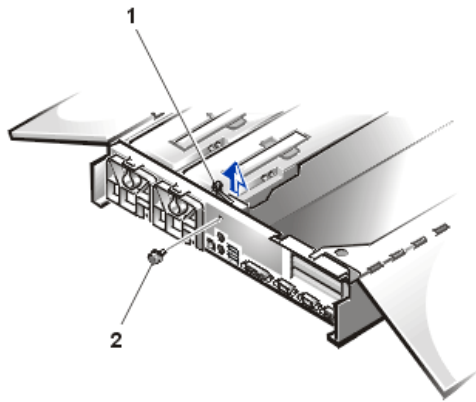
1. [Remove the front bezel.](#)
2. [Open the system doors.](#)
3. Disconnect the control panel cable from the P4 connector on the left side of the interposer board.
4. Remove the [SCSI ID 4](#) hard-disk drive, located below the floppy diskette drive.
5. Loosen the thumbscrew securing the peripheral cage and slide the peripheral cage back 12.5 mm (0.5 inch). It is not necessary to remove the peripheral cage or the hard-disk drives installed in or on top of the peripheral cage.
6. Remove the screw holding the control panel assembly to the front of the system chassis (see [Figure 4](#)). Retain this screw for use in securing the replacement control panel assembly.
7. Push the left side of the control panel assembly back 12.5 mm (0.5 inch) and then slide it to the right to free the control panel from its chassis slot.
8. Remove the control-panel assembly ribbon cable from its retaining bracket inside the chassis.

To install a replacement control panel, slide the control panel into its slot above the hard-disk drive cage, and then swing the free end forward. Ensure that the two LEDs are in their position in the front panel, and secure the control panel with the screw removed in step 6. Slide the peripheral cage forward and secure it with its thumbscrew. Reconnect the control panel cable to the interposer board P4 connector, and place the ribbon cable under its bracket.

Chassis Intrusion Switch

Figure 5. Chassis Intrusion Switch Removal

- 1 Chassis intrusion switch
- 2 Screw



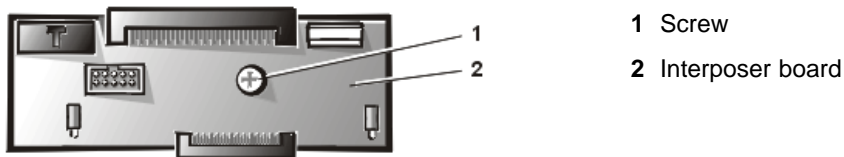
To remove the chassis intrusion switch, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. [Remove the front bezel.](#)
2. [Open the system doors.](#)
3. Disconnect the chassis intrusion switch cable from the INTRUS1 connector on the system board (see [system board features](#)).
The INTRUS1 connector is located at the left back corner of the system board, just forward of the Ethernet RJ45 connector.
4. Remove the screw holding the intrusion switch and its bracket to the system chassis back panel (see [Figure 5](#)).
5. Separate the switch and cable from its bracket.
6. Lift the chassis intrusion switch and cable out of the chassis.

Interposer Board

Figure 6. Interposer Board Removal



- 1 Screw
- 2 Interposer board

To remove the interposer board, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

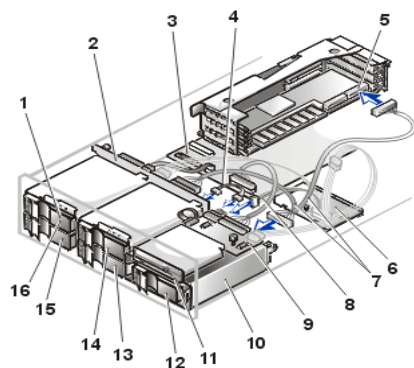
1. [Remove the front bezel.](#)
2. [Open the system doors.](#)
3. Disconnect all cables connected to the interposer board (see [Figure 3](#) for location).
These cables include the system board interface cable, cooling fans wiring harness, interposer board power cable, and the control panel cable.
4. Loosen the thumbscrew at the center of the interposer board (see [Figure 6](#)).

- Slide the interposer board toward the back of the system approximately 12.5 mm (0.5 inch), then lift the interposer board up and out of the chassis.

Drives

[Figure 7](#) shows examples of drive hardware that can be installed in the system. Refer to this figure when you perform any of the procedures in the following subsections.

Figure 7. Externally-Accessible Drives and Internal Components



- SCSI hard-disk drives (5)
- SCSI backplane board
- SCSI backplane board interface cable
- SCSI peripheral bay interface cable
- PERC 2/DC SCSI interface connector
- DC power distribution board
- SCSI backplane board data cable
- Interposer board interface cable
- Interposer board
- SCSI ID 4 carrier
- Combination diskette drive and CD-ROM drive
- SCSI ID 4 (fifth hard disk drive)
- SCSI ID 3
- SCSI ID 2
- SCSI ID 1
- SCSI ID 0

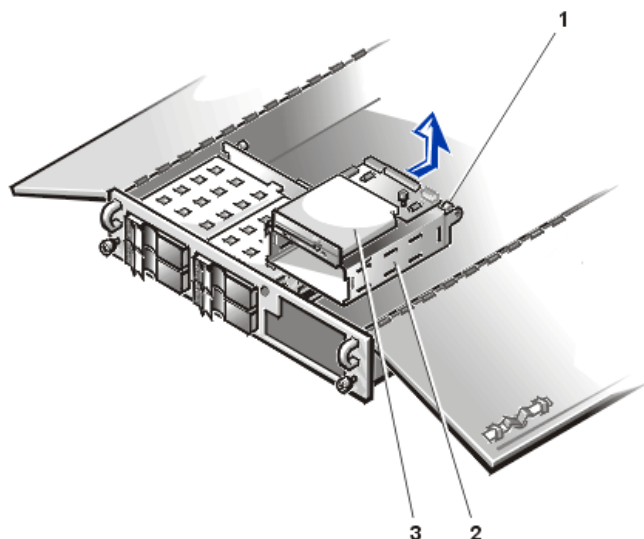
Removing the Integrated 3.5-Inch Diskette Drive and CD-ROM Drive

To remove the integrated 3.5-inch diskette drive and CD-ROM drive, perform the following steps:

- [Open the system doors.](#)
- [Remove the interposer board.](#)
- Disconnect the DC power cables and the interface cables from the back of all drives.
- Remove the hard-disk drive from the peripheral cage.
- Loosen the thumbscrew securing the peripheral cage and slide the peripheral cage back 6.3 mm (0.25 inch). Lift the peripheral drive cage out of the chassis and set it on a smooth, non-conducting work surface (see [Figure 8](#)).

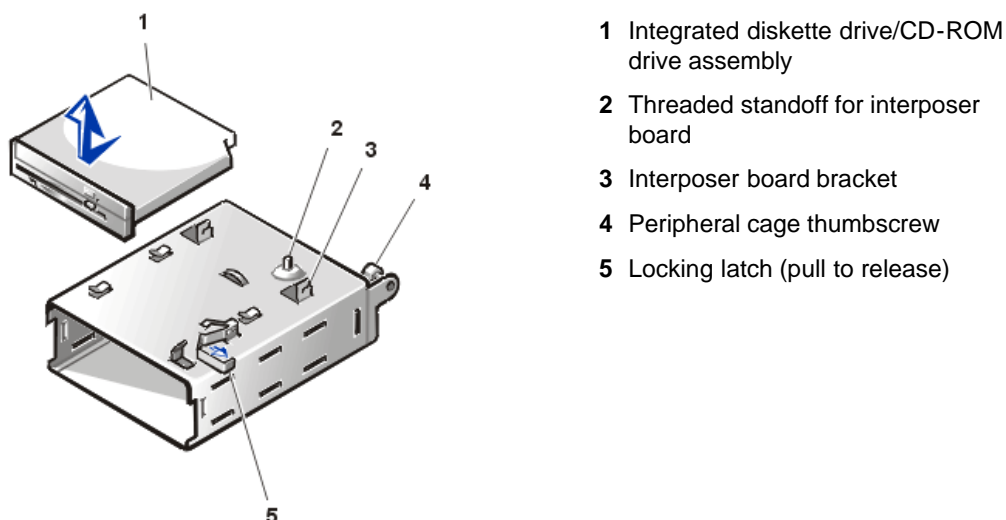
Figure 8. Peripheral Drive Cage Removal

- Thumbscrew
- Peripheral drive cage
- Integrated 3.5-inch diskette drive and CD-ROM drive assembly
- Hard-disk drive



6. Pull the locking latch away from the integrated diskette drive/CD-ROM drive assembly approximately 12.5 mm (one-half inch).
7. Slide the integrated diskette drive/hard-disk drive assembly forward approximately 12.5 mm (one-half inch) to slide the assembly off its locking clips, then lift the integrated diskette drive/CD-ROM drive assembly off the top of the peripheral cage (see [Figure 9](#)).

Figure 9. 3.5-inch Diskette Drive and CD-ROM Drive Removal



- 1 Integrated diskette drive/CD-ROM drive assembly
- 2 Threaded standoff for interposer board
- 3 Interposer board bracket
- 4 Peripheral cage thumbscrew
- 5 Locking latch (pull to release)

When installing the replacement integrated diskette drive/CD-ROM drive assembly, make sure that the retaining tabs at the sides of the drive assembly engage the locking clips on the top of the peripheral drive cage. The locking latch on the top right side of the peripherals drive cage will click when you push the drive assembly into place.

Hard-Disk Drive Removal

Each hard-disk drive is mounted in a hard-disk drive carrier. The front bezel must be removed from the system front panel, and a square metal locking pin must be lifted out before you remove a drive carrier.

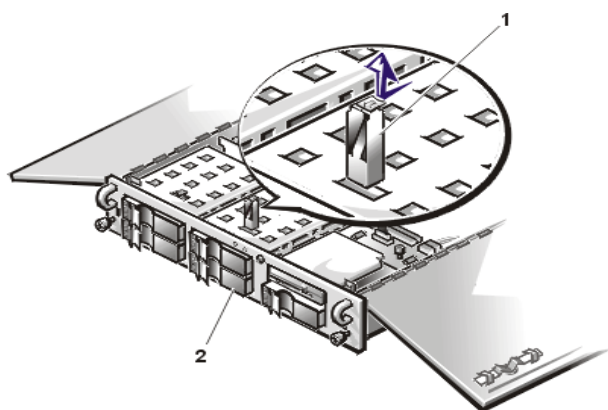
To remove a hard-disk drive and its carrier, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Shut down the system and disconnect the cables (see [Protecting Against Electrostatic Discharge](#)).
2. If the optional plastic bezel is installed, [remove it](#).

3. If you have not already done so, [unlock and open the system doors](#) and remove the hard-disk drive lock from the hard-disk drive bay you intend to remove (see [Figure 10](#)).

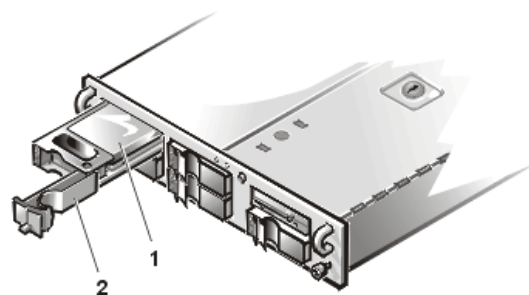
Figure 10. Hard-Disk Drive Lock



- 1 Hard-disk drive lock
- 2 Hard-disk drive carrier

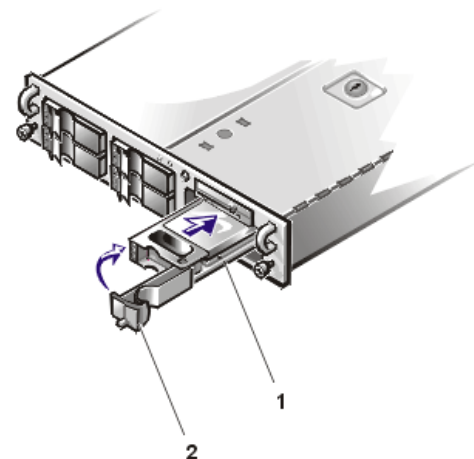
4. Open the hard-disk drive carrier handle and slide the carrier toward you until it is free of the hard-disk drive bay (see [Figure 11](#) or [Figure 12](#)).

Figure 11. Hard-Disk Drive and Carrier Removal



- 1 Hard-disk drive
- 2 Hard-disk drive carrier

Figure 12. SCSI ID 4 Hard-Disk Drive and Carrier Removal

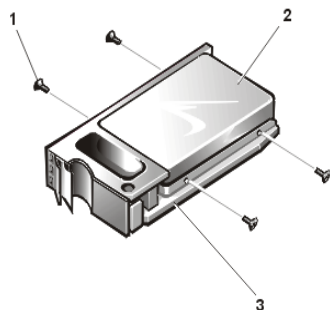


- 1 Hard-disk drive carrier
- 2 Hard-disk drive carrier handle

5. If your replacement hard-disk drive is installed in its carrier, open the handle on the carrier.

6. If the replacement hard-disk drive has no carrier, remove the hard-disk drive that you removed from its carrier:
 - a. Remove the four screws that secure the drive to the carrier (see [Figure 13](#)).
 - b. Remove the hard-disk drive from the carrier.

Figure 13. Removing the Hard-Disk Drive From the Carrier



- 1 Screws (4)
- 2 Hard-disk drive
- 3 Hard-disk drive carrier

To install a replacement hard-disk drive, perform the following steps:

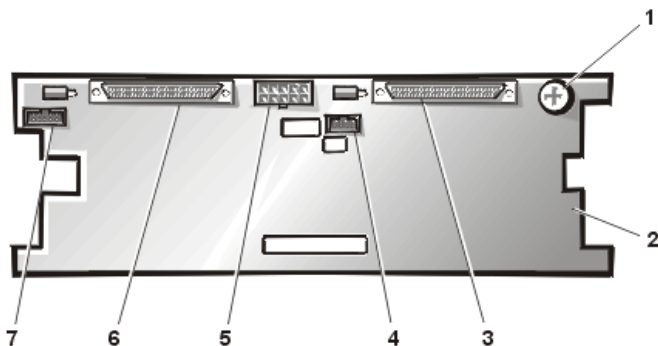
1. Insert the replacement hard-disk drive into the carrier and install four screws to secure the hard-disk drive.
2. Open the handle on the carrier and install the replacement hard-disk drive and carrier into its slot. Close the handle until it engages the front panel, locking the hard-disk drive in place.
3. Reinstall the hard-disk drive lock you removed in step 3 of the previous procedure.
4. If you removed the front bezel in step 2 of the previous procedure, reinstall it now.

NOTICE: When replacing the optional front bezel, ensure that the bezel is oriented so that its status indicators are positioned just below the Dell nameplate in the center of the bezel.

SCSI Backplane Boards

The SCSI backplane board has connectors on the front that connect to the four hard-disk drives and to one SCSI backplane daughter card (see [Figure 14](#)). On the back side are connectors that connect to the SCSI interface cables that attach to either one of the system board SCSI connectors or to an expansion card connector. One SCSI connector attaches to a SCSI device installed in the externally-accessible peripherals bay, if installed. A DC power connector accepts a power cord from the PSDB.

Figure 14. SCSI Backplane



- 1 Thumbscrew
- 2 SCSI backplane board
- 3 Ultra3 SCSI cable connectors (SCSIB)
- 4 System board data cable connector (PLANAR)
- 5 Power connector (POWER2)
- 6 Ultra3 SCSI cable connector (SCSEA)
- 7 Data cable connector to the [fifth hard-disk drive](#) backplane (SCSI ID 4)

To remove a SCSI backplane board, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. [Remove the optional plastic bezel](#) (if installed).
2. If you have not already done so, [unlock and open the system doors](#) and [remove the hard-disk drive locks](#) from the hard-disk drive bays (see [Figure 10](#)).
3. [Remove the fan assembly](#).

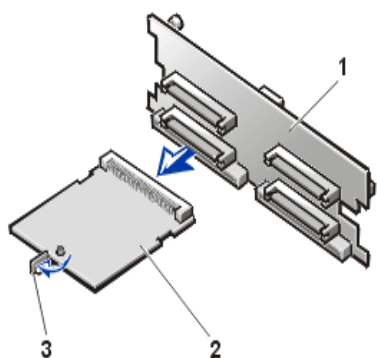
NOTICE: You must remove all hard-disk drives to gain access to the SCSI daughter card and to enable the removal of the SCSI backplane board.

4. Unlatch and pull all four hard-disk drives from the hard-disk drive bay. Label the drives with their location in the hard-disk drive bay.
5. Remove the SCSI backplane daughter card by opening the retention lever on each card's front edge and pulling the daughter card out of its socket on the SCSI backplane (see [Figure 15](#)).

When installing a replacement SCSI backplane board, see [Figure 16](#) for cable connections.

NOTICE: To prevent your system from overheating, make sure the SCSI cables do not block the cooling fans.

Figure 15. Removing the SCSI Daughter Card



- 1 SCSI backplane board
- 2 SCSI backplane daughter cards
- 3 Retention lever

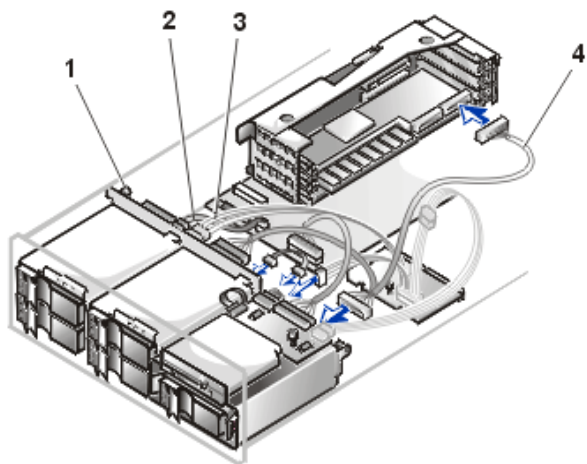
6. Record the connectors used and disconnect all SCSI cables attached to the SCSI backplane board (see [Figure 16](#)).

DC power connector (POWER2) is connected to the power input connector on the backplane board.

NOTICE: To prevent your system from overheating, make sure the SCSI cables do not block the cooling fans.

Figure 16. SCSI Backplane Connectors

- 1 Thumbscrew
- 2 Data interface cable to system board (BACKPLANE)
- 3 Power cable to PSDB (P2)
- 4 Ultra3 SCSI cable to PERC 2/DC

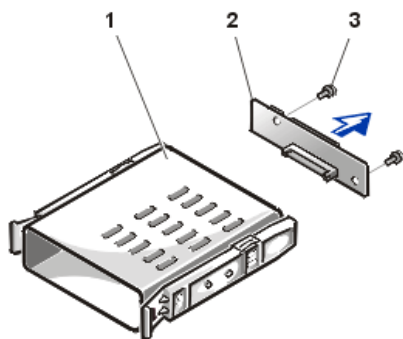


7. Loosen the thumbscrew on the SCSI backplane board (see [Figure 16](#)).
8. Slide the SCSI backplane board to the right (toward the center of the chassis) about 6.3 millimeters (a quarter-inch) and lift it off the L-shaped mounting tabs on the hard-disk drive cage.

SCSI ID 4 Hard-Disk Drive SCSI Backplane

The [SCSI ID 4](#) drive has a smaller SCSI backplane board on the back of its hard-disk drive cage.

Figure 17. Removing the SCSI Backplane from the SCSI ID 4 Hard-Disk Drive Cage



- 1 [Fifth hard-disk drive](#) cage
- 2 SCSI backplane
- 3 Screws (2)

To remove the SCSI backplane from the [fifth hard-disk drive](#) cage, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Shut down the system and disconnect cables (see [Protecting Against Electrostatic Discharge](#)).
2. If the optional plastic bezel is installed, [remove it](#).
3. If you have not already done so, [unlock and open the system doors](#).
4. [Remove the fifth hard-disk drive](#) and carrier from the hard-disk drive cage that is mounted in the peripheral bay.
5. Remove the ribbon-style backplane cable from the 10-conductor connector on the SCSI backplane.
6. Remove the 68-conductor SCSI cable from the [fifth hard-disk drive](#) SCSI backplane board.
7. Remove the DC power cable from the SCSI backplane board.
8. Loosen the thumbscrew securing the peripheral bay and slide the peripheral bay back 2.5 cm (one inch), then lift the peripheral bay upwards and set it aside (see [Figure 8](#)).

9. Release the [fifth hard-disk drive](#) cage by pressing inward (toward the center of the drive) on the two drive-release tabs, and sliding the hard-disk drive cage out the front of the peripherals bay.
10. Use a 1/4-inch nut driver or a #2 Phillips screwdriver to remove the two screws that secure the SCSI backplane to the back of the hard-disk drive cage (see [Figure 17](#)).

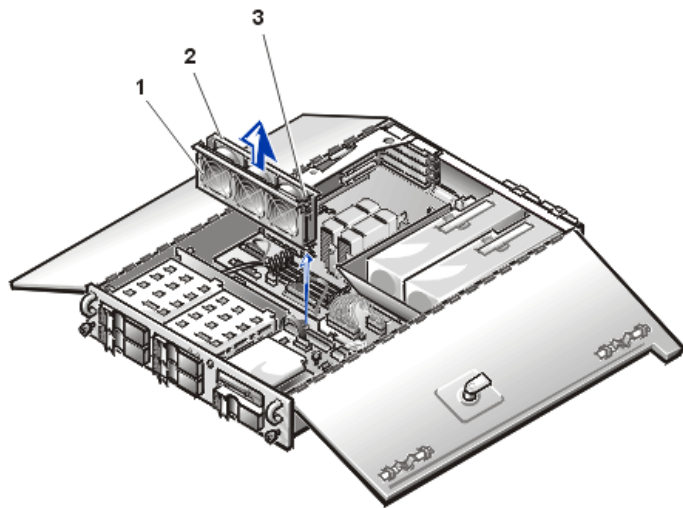
Cooling Fans

Three cooling fans are installed in the center of the system chassis. (Fan 1 is the outermost fan in the fan assembly.) If you observe that one of the fans is not operating or if the Dell Hardware Instrumentation Package (HIP) server management application issues a fan-related error message, perform the following steps to replace the faulty fan.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Open the system doors](#).
3. Disconnect the cooling fan power cable from the interposer board by pressing the release tab on the power cable connector.
4. Unscrew the retention pin from the chassis and lift the fan assembly out of the system chassis.
5. To replace an individual fan, perform the following steps:
 - a. Separate the two halves of the fan assembly by pressing the locking tabs at each end of the assembly.
 - b. Remove the faulty fan and disconnect it from the fan power wiring harness (see [Figure 18](#)).

Figure 18. Removing the Fan Assembly



- 1 Cooling fans (3)
- 2 Fan bracket
- 3 Thumbscrew

- c. Install a new fan in the assembly and connect it to the fan power wiring harness. Ensure that the replacement fan is oriented the same way as the original fan.
 - d. Join the two halves of the fan assembly.
6. Slide the fan assembly back into the system and reinstall the retention thumbscrew.
7. When reinstalling the fan, be careful to avoid pinching the system interface cables.
8. Connect the fan power wiring harness to the interposer board.
9. [Close the system doors](#) and reconnect the system to AC power.

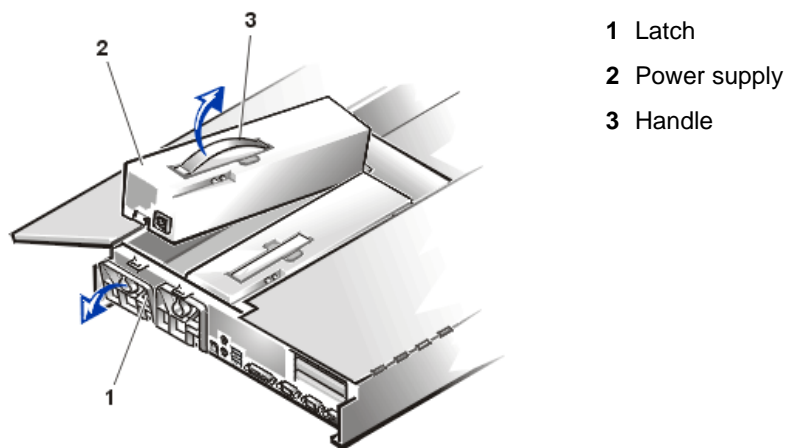
10. Turn on the system.

Power Supplies

The system may contain one or two hot-pluggable power supplies.

Hot-Pluggable Power Supply

Figure 19. Hot-Pluggable Power Supply Removal



- 1 Latch
- 2 Power supply
- 3 Handle

To remove a hot-pluggable power supply with the system operating, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.



CAUTION: Avoid touching the card-edge connector on the back of the power supply. Wait 10 to 20 seconds after disconnecting the power supply from its slot connector before removing the power supply or coming into contact with its back card-edge connector.


1. [Open the system doors.](#)
2. Observe the status indicators on the back of each power supply. If the red (front) indicator lights up, replace that power supply.
3. If there is only one power supply in the system, turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet. Disconnect only the faulty power supply from its electrical outlet.
4. Unplug the power cord from the faulty power supply.

NOTICE: The power supply is heavy. Support it with both hands when installing or removing it.

5. Remove the power supply:
 - a. The power supply is secured by a latch on the back panel of the system.
 - b. Rotate the top of the power supply latch downward.
6. Grasp the handle on the top of the power supply and lift the power supply straight up from the system.
7. Lower the new power supply into the chassis.

Ensure that the power supply is properly seated into its slot in the chassis.
8. Close the power supply latch.

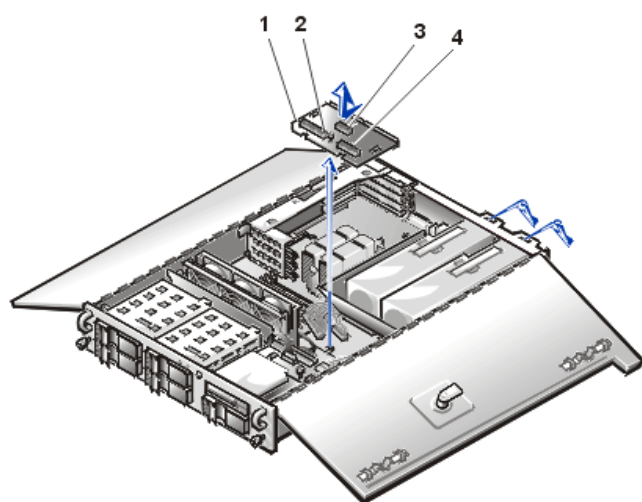
As the latch closes, notice that the power supply slides back in its slot to engage its back-panel connectors with the mating connector on the PSDB.

 **NOTE:** The power supply will not function until the latch is engaged.

9. Connect the AC power cable to the new power supply and route the cable through the strain-relief clip on the back panel.
10. Connect the free end of the AC power cable to an electrical outlet.
11. Observe the back panel of the power supply to verify that the green power indicator LED is lit and that the red failure LED is off.
12. [Close the top doors](#).

Power Supply Distribution Board

Figure 20. Removing the Power Supply Distribution Board



- 1 Power connector P1
- 2 Thumbscrew
- 3 Power connector P3
- 4 Power connector P2

To remove the PSDB, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable(s) from its (their) power source.
2. Open the [system doors](#).
3. Disconnect the AC power cable from the AC power receptacle on the back of each installed power supply, and rotate the top of the power supply latch downward.
4. [Remove the fan assembly](#).
5. At the PSDB (see [Figure 20](#)), record the mating connector location and disconnect the 12-conductor power cable harness attached to the P3 connector.
6. Record the mating connector location and disconnect the 24-conductor power cable harness attached to the P1 connector on the PSDB.
7. Record the mating connector location and disconnect the 18-conductor power cable harness attached to the P2 connector on the PSDB.
8. Loosen the thumbscrew on the PSDB and remove the PSDB from the chassis.

When installing the replacement PSDB, fold the cable harnesses out of the way as you are inserting the PSDB. The side of the PSDB with the card-edge connector that mates with the power supply connector should be lowered into position first; this simplifies installation of the PSDB.

Expansion Cards

The system has a removable expansion-card cage, which simplifies many installation procedures by allowing the user to remove the riser board and all installed expansion cards in a single step.

Removing the Expansion Card Cage

To remove the expansion-card cage, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Open the [system doors](#).
2. Check any cables connected to expansion cards through the back-panel openings. Disconnect any cables that will not reach to where the cage must be placed after removal from the chassis.


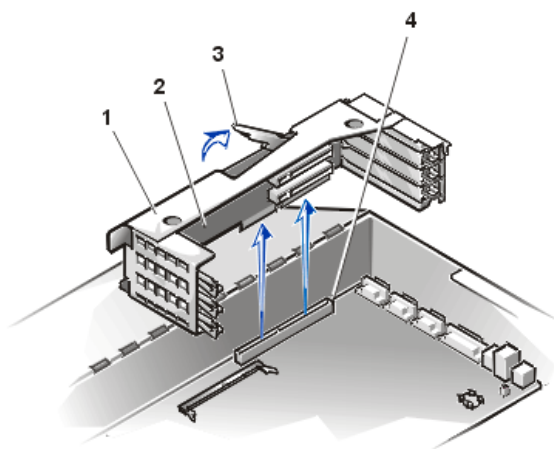
 **NOTE:** Verify that the power LED on the riser board is off before removing the card cage.

Figure 21. Expansion-Card Cage



- 1 PCI expansion-card cage
- 2 Securing lever

3. Locate the expansion-card cage securing lever (see [Figure 21](#)). Rotate the lever upward until it stops in an upright position.
4. Lift the expansion-card cage up and away from the chassis.

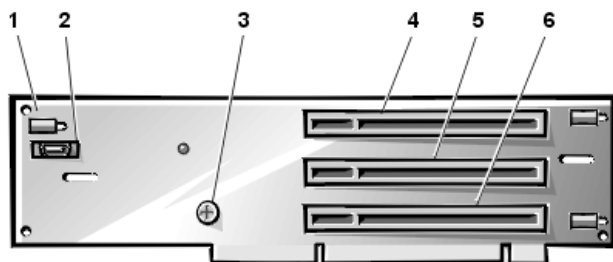
Replacing the Expansion-Card Cage

To replace the expansion-card cage, perform the following steps:

1. With the securing lever in the upright position, lower the expansion-card cage into place until it is aligned.
2. Rotate the securing lever downward until it is flush with the top of the chassis. Make sure the riser board is fully seated in the RISER connector on the system board.
3. Reconnect any cables you removed in step 3 of the previous procedure, "[Removing the Expansion-Card Cage](#)."

Figure 22. Replacing the Riser Board

- 1 Riser board
- 2 DRAC 2 server management connector



- 3 Thumbscrew
- 4 PCI expansion-card connector PCI3
- 5 PCI expansion-card connector PCI2
- 6 PCI expansion-card connector PCI1

The riser board contains three full-length 32-bit, 33-MHz PCI expansion-card connectors. All three connectors support both 3.3-V and 5-V cards. Connector PCI2 supports an optional Dell OpenManage Remote Assistant Card 2 (DRAC 2).

To remove the riser board, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.


1. [Open the system doors](#).
2. Disconnect any cables connected to the card.
3. [Remove the expansion-card cage](#).
4. [Remove all expansion cards](#) from the expansion-card cage.
5. Remove the thumbscrew that secures the riser board to the expansion-card cage.
6. Slide the riser board 6.3 mm (0.25 inch) to the left (with the riser board facing you) and lift the riser board out of the expansion-card cage.

Expansion Card Removal

To remove an expansion card, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

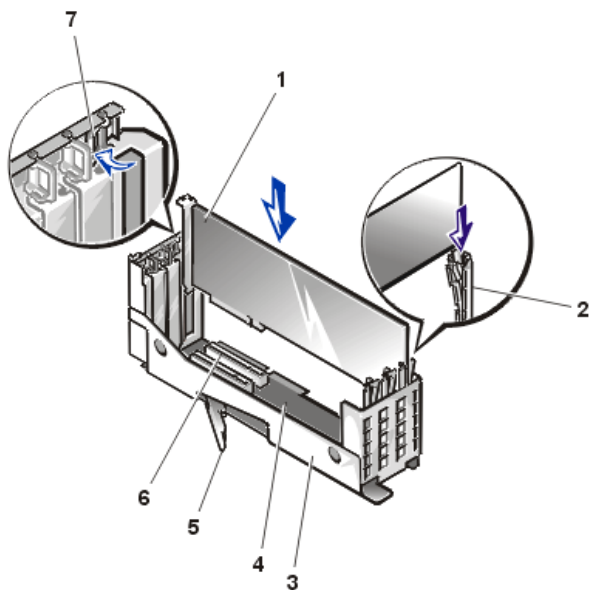
1. [Open the system doors](#).
2. Disconnect any cables connected to the card.
3. [Remove the expansion-card cage](#).
4. To release an expansion-card's back-panel bracket, rotate the latch away from the expansion-card bracket (see [Figure 23](#)).
5. If the expansion card is a full-length card, release the card's inner end (toward the front of the system) by opening the tab on the plastic card guide (see [Figure 23](#)).
6. Grasp the expansion card by its top corners, and carefully remove it from the expansion-card connector.
7. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.

 **NOTE:** Installing a filler bracket over an empty expansion slot is necessary to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

8. [Replace the expansion-card cage](#).
9. Close the [system doors](#), and then reconnect the system and peripherals to their AC power sources and turn them on.

Figure 23. Replacing the Expansion Card

1 Expansion-card latch



- 2 Expansion card
- 3 Card guide
- 4 Expansion-card cage
- 5 Riser board
- 6 Expansion-card connector
- 7 Card-edge connector

Replacing the Expansion Card

To install a replacement expansion card, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.


1. Open the [system doors](#).
2. [Remove the expansion-card cage](#).
3. Prepare the replacement expansion card for installation.

See the documentation that came with the expansion card for information on configuring the card, making internal connections, or otherwise customizing the card for the system.
4. Select the expansion slot that you will install the new expansion card in.
5. To release an expansion-card's back-panel bracket, rotate the latch away from the expansion-card bracket (see [Figure 23](#)).
6. To install the card, insert the card-edge connector firmly into the expansion-card connector on the chassis.
7. When the card is firmly seated in the connector and the card-mounting bracket is aligned with the brackets on either side of it, close the expansion-card latch.
8. If the expansion card is a full-length card, secure the inner end of the card by closing the plastic latch on the card guide over the top edge of the card (see [Figure 23](#)).
9. Connect any cables that should be attached to the card.

See the documentation that came with the card for information about cable connections.
10. [Install the expansion-card cage into the chassis](#).
11. Close the [system doors](#), and then reconnect the system and peripherals to their AC power sources and turn them on.

DIMMs

The four DIMM sockets on the system board can accommodate 512 MB to 1 GB of registered SDRAM. The DIMM sockets are located near the back edge of the system board (see [Figure 30](#) for location on the system board).

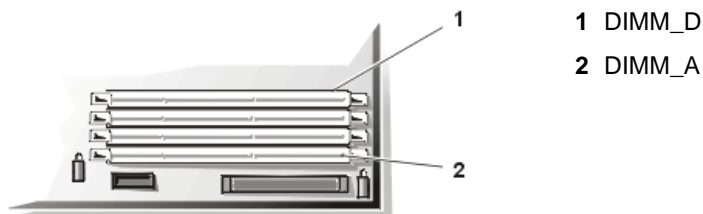
 **NOTE:** The DIMMs must be rated to run at 133 MHz or faster.

DIMM Installation Guidelines

Starting with the socket nearest to the system board's back edge, the DIMM sockets are labeled "DIMM_A" through "DIMM_D" (see [Figure 24](#)). When you install DIMMs, follow these guidelines:

- Install a DIMM in socket DIMM_A before socket DIMM_B, socket DIMM_B before socket DIMM_C, and so on.
- If you install different sizes of DIMMs, install them in order of descending capacity, beginning with the highest-capacity DIMM in socket DIMM_A.
- You do not need to install DIMMs in pairs.

Figure 24. DIMM Socket Locations



DIMM Installation

To install a DIMM, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the front bezel](#).
3. [Open the system doors](#).
4. Disconnect the AC power cable and all peripheral cables from the back panel of the system.
5. Locate the DIMM sockets in which you will install or replace DIMMs.

[Figure 30](#) shows the relative location of the DIMM sockets on the system board. [Figure 24](#) shows the labeling of the DIMM sockets.

6. Press down and outward on the ejectors on the DIMM socket, as shown in [Figure 25](#), to allow the DIMM to be inserted into the socket.

Figure 25. DIMM Installation




7. Align the DIMM's edge connector with the slot in the center of the DIMM socket, and insert the DIMM in the socket (see [Figure 25](#)).

The DIMM socket has two alignment keys that allow the DIMM to be installed in the socket in only one way.

8. Press down on the DIMM with your thumbs while pulling up on the ejectors with your index fingers to lock the DIMM into the socket (see [Figure 25](#)). When the DIMM is properly seated in the socket, the ejectors on the DIMM socket should align with the ejectors on the other sockets with DIMMs installed.
9. Repeat steps 7 and 8 to install the remaining DIMMs.

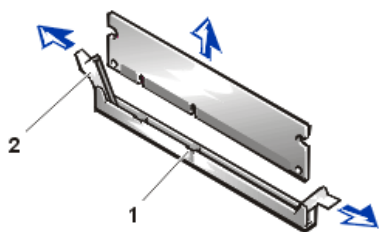
DIMM Removal

To remove a DIMM, press down and outward on the ejectors on each end of the socket until the DIMM pops out of the socket (see [Figure 26](#)).

 **NOTES:** This procedure assumes the power is off and you have access to the DIMM slots. See steps 1 through 6 of the DIMM Installation procedure for these preliminary steps.

If you encounter difficulty in moving the ejector nearest to the chassis wall, press down on the opposite ejector and lift that end of the DIMM slightly to free the DIMM from its socket.

Figure 26. DIMM Removal



- 1 Alignment keys (2)
- 2 DIMM socket ejectors (2)

Microprocessor

The microprocessor is contained within a single-edge contact (SEC) cartridge and heat sink assembly. The system board has two guide bracket assemblies, which hold the SEC cartridge and heat sink assemblies. If your system has only one microprocessor, the secondary guide bracket assembly connector must contain a terminator card. If your system has two microprocessors, the secondary microprocessor must have the same operating frequency as the first. For example, if the system has a 866-MHz primary microprocessor, your secondary microprocessor must also be a 866-MHz microprocessor.

Terminator Card Removal

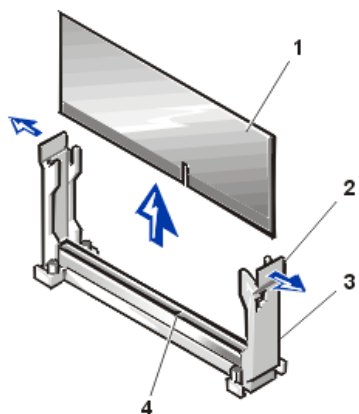
To remove a terminator card, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the front bezel](#).
3. Open the [system doors](#).
4. Disconnect the AC power cable and all peripheral cables from the back panel of the system.
5. Lift the terminator card up and out of the guide bracket assembly (see [Figure 27](#)).

Figure 27. Removing the Terminator Card

- 1 Terminator card
- 2 Tabs (2)
- 3 Guide bracket assembly
- 4 Socket



Installing a Terminator Card

To install a terminator card, align the notch on the terminator card with the socket on the guide bracket assembly and guide the card into the empty guide bracket assembly.

Removing the SEC Cartridge and Heat Sink Assembly

To remove the SEC cartridge and heat sink assembly, perform the following steps.

CAUTION: The SEC cartridge and heat sink assembly can get extremely hot during system operation. Be sure the assembly has had sufficient time to cool before you touch it.

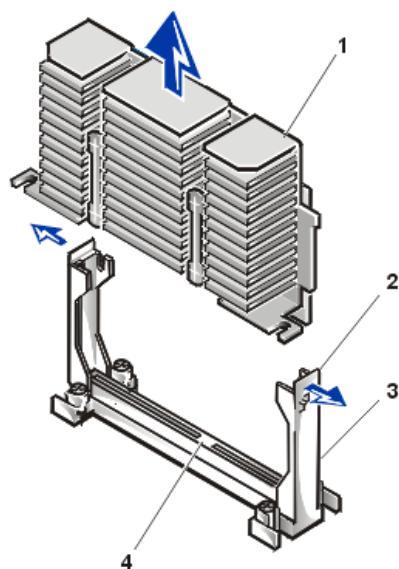
CAUTION: When handling the SEC cartridge and heat sink assembly, take care to avoid sharp edges on the heat sink.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the front bezel.](#)
3. Open the [system doors.](#)
4. Disconnect the AC power cable and all peripheral cables from the back panel of the system.
5. Deflect and lift one end of the guide bracket about 6.3 mm (0.25 inch) to disengage one end of the microprocessor's connector from the socket.
6. Deflect the tab on the other end of the guide bracket to disengage the tab on the heat sink.
7. Lift the cartridge and heat sink assembly away from the guide bracket assembly (see [Figure 28](#)).

Figure 28. Removing the SEC Cartridge and Heat Sink

- 1 SEC cartridge
- 2 Tab on guide bracket (2)
- 3 Guide bracket assembly
- 4 Socket



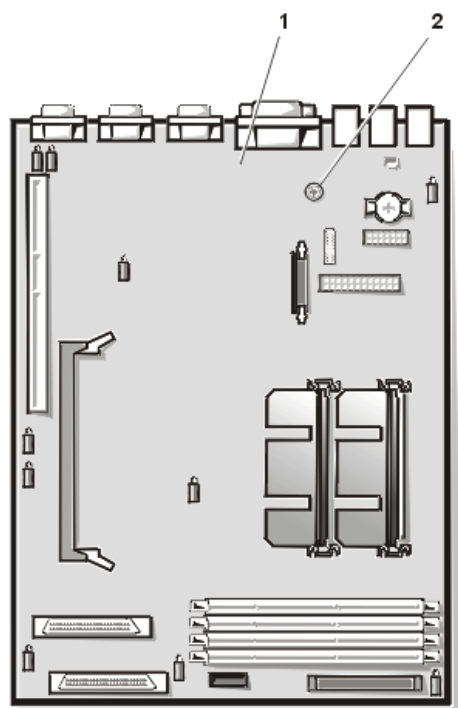
Replacing the SEC Cartridge and Heat Sink Assembly

To install the replacement SEC cartridge and heat sink assembly, see [Figure 28](#) and perform the following steps:

1. Remove the [terminator card](#) or old [SEC cartridge](#) from the guide bracket assembly.
2. Slide the SEC cartridge into the guide bracket assembly, and firmly seat the assembly until the tabs on the guide bracket assembly snap into place over the ends of the heat sink (see [Figure 28](#)).
3. Close the [system doors](#).

System Board

Figure 29. System Board Removal



- 1 System board
- 2 Thumbscrew

To remove the system board, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. [Open the system doors](#).
3. Remove all external peripheral cables from their connectors at the back of the system.
4. Record the locations and remove all internal cables (including power cables) attached to the system board.
5. [Remove the expansion card cage](#).
6. [Remove the fan assembly](#).
7. Unscrew the thumbscrew securing the system board to the chassis floor.
8. Slide the system board toward the front of the bracket about 6.3 mm (1/4 inch).
9. Carefully lift the system board up and out of the chassis. Be sure to lift evenly and not twist the system board.

Place the system board on a smooth, antistatic surface.

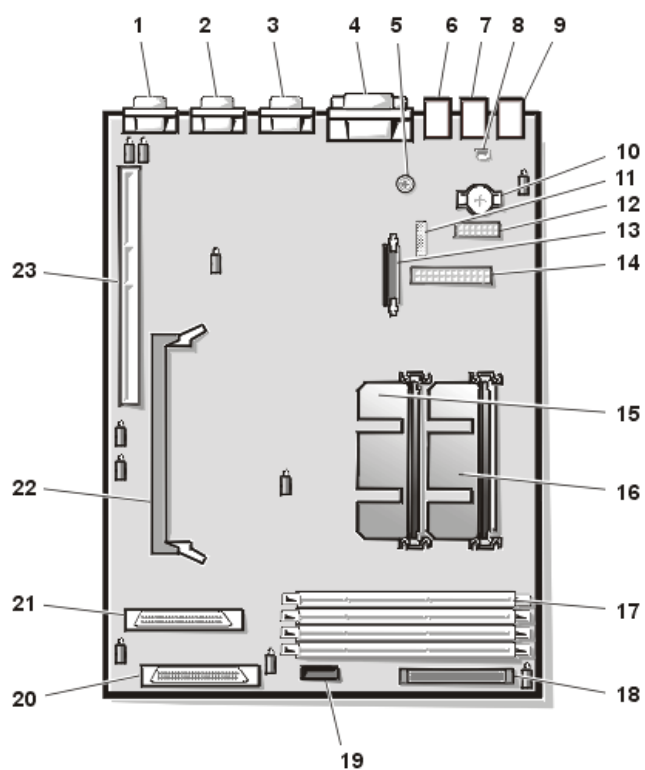
10. [Remove the microprocessor\(s\)](#) and [terminator card](#).
11. Remove the [DIMMs](#).

When installing the replacement system board, install the system board into the chassis, then install the following components which you removed from the old system board: DIMMs, microprocessor(s), terminator card or secondary microprocessor. Set the system board jumpers to the same settings on the board you removed. Install the expansion-card cage. Replace the fan assembly. Next, connect all internal cables to the system board, and then close the system doors. Reconnect the I/O cables and power cables to the back panel, and turn the system power on.

System Board Features

[Figure 30](#) defines the system board features. Use this figure when replacing your system board or components that attach to the system board.

Figure 30. System Board Features



- 1 Video connector (VGA) (not supported)
- 2 Serial port connector (COM1) (Administration port)
- 3 Serial port connector (COM2) (UPS port)
- 4 Parallel port connector (PARALLEL) (not supported)
- 5 Thumbscrew
- 6 Universal Serial Bus (USB) connectors (2)
- 7 Keyboard and mouse connectors (KYBD/MOUSE) (not used during normal operation)
- 8 Chassis intrusion switch connector (INTRUS1)
- 9 Network interface connector (ENET)
- 10 Battery connector (BATTERY)
- 11 Configuration jumpers
- 12 Power input connector (POWER3)
- 13 hardware key connector for optional RAID controller (RAID_KEY) (not supported)
- 14 Power input connector (POWER1)
- 15 Primary microprocessor (PROC_2)
- 16 Primary microprocessor (PROC_1)
- 17 DIMM sockets (DIMM_A–DIMM_D)
- 18 Interposer board interface cable connector (I/O CONN)
- 19 SCSI backplane board interface cable connector (BACKPLANE)
- 20 U160/m SCSI connector (SCSI2 [Channel B])
- 21 U160/m SCSI connector (SCSI2 [Channel A]) PCI riser board connector (RISER)
- 22 DIMM socket for optional RAID controller (DIMM_RAID) (not supported)
- 23 PCI riser board connector (RISER)

Battery

The system battery maintains system configuration, date, and time information in a special section of memory when you turn off the system. The operating life of the battery ranges from 2 to 5 years, depending on how you use the system (for example, if you keep the system on most of the time, the battery gets little use and thus lasts longer). You may need to replace the battery if an incorrect time or date is displayed during the boot routine along with the following or similar message:

```
Time-of-day not set -- please run SETUP program
```

```
Strike the F1 key to continue, F2 to run the setup utility
```

or

```
System CMOS checksum bad -- Run SETUP
```

```
Strike the F1 key to continue, F2 to run the setup utility
```

or

```
Invalid configuration information -- please run SETUP program
```

```
Strike the F1 key to continue, F2 to run the setup utility
```

To determine if the battery needs replacing, re-enter the time and date through the [System Setup program](#). Turn off the system for a few hours, and then turn it on again. Enter the System Setup program. If the date and time are not correct in the System Setup program, replace the battery.



NOTES: Some software may cause the system time to speed up or slow down. If the system seems to operate normally except for the time kept in the System Setup program, the problem may be caused by software rather than by a defective battery.

If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is not caused by a defective battery.

You can operate the system without a battery; however, the system configuration information maintained by the battery in NVRAM is erased each time you shut down the system. Therefore, you must reenter the system configuration information and reset the options each time the system initializes until you replace the battery.

The battery is a 3.0-volt (V), coin-cell CR2032-type battery. To remove the battery, perform the following steps.



CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens.

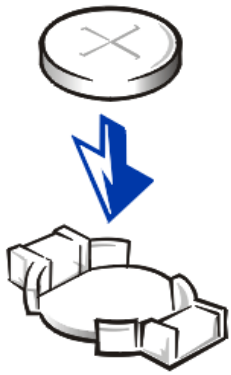
See "[Using the System Setup Program](#)" in the *User's Guide* for instructions.

2. Shut down the system, including any attached peripherals, and disconnect the system from the electrical outlet.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

3. Open the [system doors](#).
4. If necessary, remove the [expansion cards](#) to gain access to the battery.
5. Remove the battery from its socket using your fingers or a blunt, nonconductive object such as a plastic screwdriver.
6. Install the new battery with the side labeled "+" facing up (see [Figure 31](#)).

Figure 31. Battery Replacement



7. Reinstall the [expansion cards](#) if you removed them in step 5.
8. Close the [system doors](#) and then reconnect the system and peripherals to their AC power sources and turn them on.
9. Enter the [System Setup program](#) to confirm that the battery is operating properly.
10. Enter the correct time and date through the System Setup program's **Time** and **Date** settings. Also reenter any system configuration information that is no longer displayed on the System Setup screens, and then exit the System Setup program.
11. Turn off the system and peripherals, and leave them off for at least an hour.
12. After an hour, turn on the system and enter the [System Setup program](#). If the time and date are still incorrect, replace the system board.

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Jumpers, Switches, and Connectors: Dell™ PowerVault™ 735N Systems Service Manual

[Overview](#)[Jumpers and Switches—A General Explanation](#)[System Board Jumpers](#)[System Board Labels](#)[SCSI Backplane Boards](#)[Interposer Board Connectors](#)[Disabling a Forgotten Password](#)

Overview

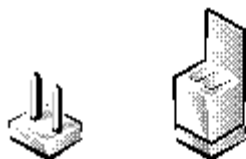
This section provides specific information about the jumpers on the system board. It also provides some basic information on jumpers and switches and describes the connectors and sockets on the various boards in the computer.

Jumpers and Switches—A General Explanation

Jumpers and switches provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When installing replacement parts or reconfiguring the system, you may need to change jumper settings on the system board. You may also need to change jumper and/or switch settings on expansion cards or drives.

Jumpers

Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated.

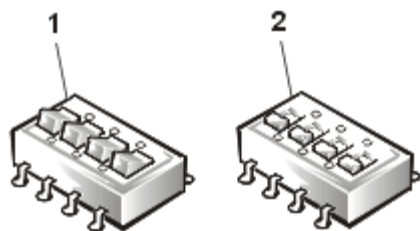


NOTICE: Make sure the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.

A jumper is referred to as open or unjumped when the plug is pushed down over only one pin or if there is no plug at all. When the plug is pushed down over two pins, the jumper is referred to as jumped. The jumper setting is often shown in text as two numbers, such as 1-2. The number 1 is printed on the circuit board so that you can identify each pin number based on the location of pin 1.

Switches

Switches control various circuits or functions in the computer system. The switches that you are most likely to encounter are dual in-line package (DIP) switches, which are normally packaged in groups of two or more switches in a plastic case. Two common types of DIP switches are slide switches and rocker switches (see the following illustration).



Rocker switch

1

Slide switch

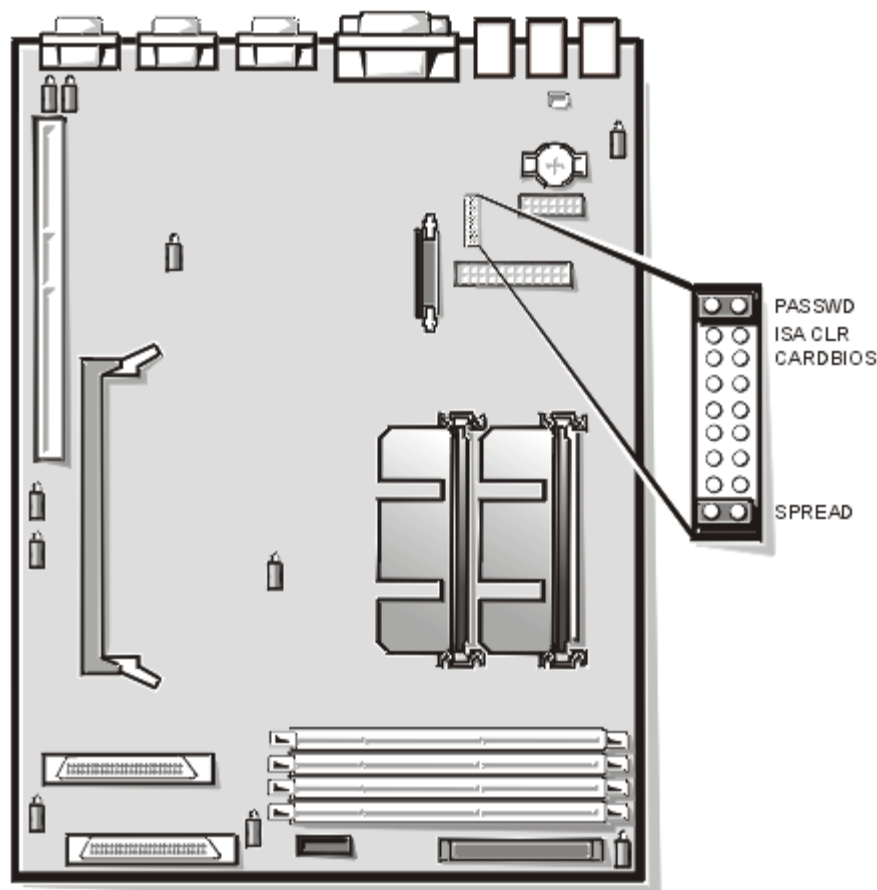
2

Each of these switches has two positions, or settings (usually on and off). To change the setting of a slide switch, use a small, pointed object such as a small screwdriver or a straightened paper clip to slide the switch to the proper position. To change the setting of a rocker switch, use the screwdriver or paper clip to press down on the appropriate side of the switch. In either case, do not use a pen, pencil, or other object that might leave a residue on the switch.

System Board Jumpers

Figure 1 shows the location of the configuration jumpers on the system board. [Table 1](#) lists the function of these jumpers.

Figure 1. System Board Jumpers

**Table 1. System-Board Jumper Settings**

Jumper	Setting	Description
CARDBIOS		Reserved (do not change).
ISA_CLR	 	(default) The ISA configuration settings are retained at system boot. The ISA configuration settings are cleared at next system boot. If the ISA configuration settings become corrupted to the point where the system will not boot, install the jumper plug and boot the system. Remove the jumper before restoring the ISA configuration information.
PASSWD	 	(default) The password feature is enabled. The password feature is disabled.
SPREAD		Reserved (do not change).
jumpered unjumpered		

System Board Labels

Table 2 lists the connectors and sockets located on the [system board](#).

Table 2. System Board Connectors and Sockets

--	--

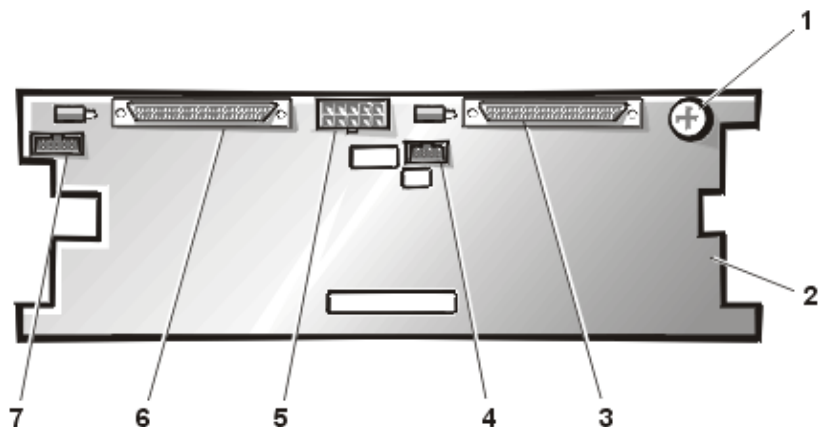
Connector or Socket	Description
BACKPLANE	Hot-pluggable SCSI backplane board interface cable connector
BATTERY	Battery connector
COM n	Serial port connectors; sometimes referred to as COM1 and COM2
DIMM_ x	DIMM sockets
DIMM_RAID	DIMM socket for integrated RAID controller (not supported)
ENET	Ethernet connector
INTRUS1	Intrusion-alarm switch connector
KYBD	Keyboard connector
MOUSE	Mouse connector
PARALLEL	Parallel port connector; sometimes referred to as LPT1
POWER n	Power connector
PROC_ n	Microprocessor guide bracket assembly and connectors
RAID_KEY	Socket for integrated RAID controller hardware key (not supported)
SCSI1, SCSI2	Ultra3 SCSI host adapter connector
USB n	USB connector
VGA	Video connector

SCSI Backplane Boards

Figure 2 shows the location of the connectors on the back of the SCSI backplane board.

Figure 2. SCSI Backplane Board Connectors

- 1 Thumbscrew
- 2 SCSI backplane board
- 3 Ultra3 SCSI connector (SCSIB)
- 4 System board interface connector (PLANAR)
- 5 Power connector (POWER2)
- 6 Ultra3 SCSI connector (SCSIA)

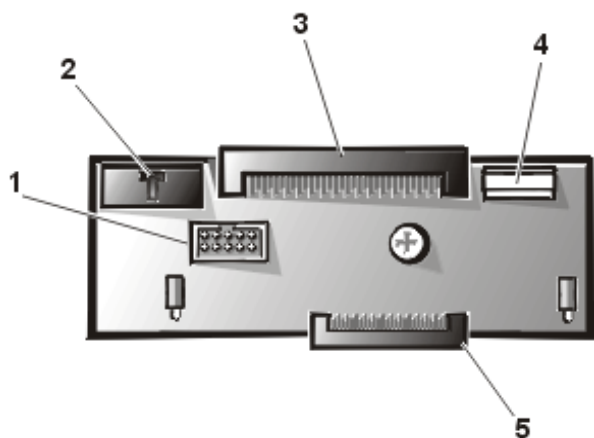


- 7 Data cable connector to the [fifth hard-disk drive](#) SCSI backplane board (SCSI ID 4)

Interposer Board Connectors

Figure 3 shows the connectors and sockets located on the interposer board.

Figure 3. Connectors on the Interposer Board



- 1 Control panel cable connector
- 2 Cooling fans wiring harness connector (P2)
- 3 System board interface cable connector (P1)
- 4 Interposer board power cable connector (P3)
- 5 Diskette drive/CD-ROM drive interface connector (J1)

Disabling a Forgotten Password

The system's software security features include a supervisor password and a user password, which are discussed in detail in "Using the System Setup Program" of the *User's Guide*. A password jumper on the system board enables these password features or disables them and clears any password(s) currently in use.

To disable a forgotten supervisor password or user password, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)" for information on protecting the system from electrostatic discharge.

1. Turn off the system, including any attached peripherals, and disconnect the AC power cable from its power source.
2. [Remove the optional front bezel](#), if it has one.
3. Open the [system doors](#).
4. Refer to "[System Board Jumpers](#)" for the location of the password jumper (labeled PASSWD) on the system board.
5. Remove the jumper plug from the PASSWD jumper.
6. Close the [system doors](#) and then reconnect the system to an electrical outlet and turn it on.

The existing passwords are not disabled (erased) until the system boots with the PASSWD jumper plug removed. However, before you assign a new system and/or user password, you must install the jumper plug.



NOTE: If you assign a new system and/or user password with the jumper plug still removed, the system disables the new password(s) the next time it boots.

7. Repeat step 1.
8. Install the jumper plug on the PASSWD jumper.
9. Close the [system doors](#) and then reconnect the system and peripherals to their electrical outlets and turn them on.
10. Assign a new system and/or user password.

To assign a new system password using the System Setup program, see "Assigning a System Password" in the *User's Guide*. To assign a new user password using the System Setup program, see "Assigning a Setup Password" in the *User's Guide*.

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Using the System Setup Program: Dell™ PowerVault™ 735N Systems Service Manual

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[Using the Setup Password Feature](#)

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Overview

This section describes the System Setup program, which is used to change the system configuration information stored in NVRAM on the system board. If the system detects a discrepancy, an error message may appear on the screen that identifies the incorrect configuration settings. Many of these settings are established using the System Setup program. The system then prompts you to enter the System Setup program to correct the setting.

When to Use the System Setup Program

You can use the System Setup program as follows:

- To change the system configuration information default settings
- To set or change user-selectable options
- To restore system configuration settings following a service action
- To enable or disable integrated devices in your system

After you set up your system, run the System Setup program to familiarize yourself with your system configuration information and optional settings. Dell recommends that you write down the information for future reference.

Entering the System Setup Program

Enter the System Setup program by performing the following steps:

1. Turn on your system.

If your system is already on, shut it down and then turn it on again.

2. Press <F2> immediately after you see the following message:

Press <F2> for System Setup

If you wait too long and your operating system begins to load into memory, let the system complete the load operation; then shut down the system and try again.



NOTE: To ensure an orderly system shutdown, consult the documentation that accompanied your operating system.

You can also enter the System Setup program by responding to certain error messages. See "[Responding to Error Messages.](#)"

System Setup Screens

The three System Setup screens, **Page 1**, **Page 2**, and the **Device List** screen, display the current setup and configuration information and optional settings for your system. (Typical examples are illustrated in [Figure 1](#).) Information on the System Setup screens is organized in five boxed areas:

- Title box — The box at the top of both screens lists the system name, page number, and the revision number of the BIOS.
- Configuration options — The box on the left half of both screens lists the options that define the installed hardware in your system.

Fields beside the options contain settings or values; those that appear bright on the screen can be changed. Settings or values that you cannot change (because they are determined by the system) appear less bright.

Some options have multiple fields, which may show settings or values as bright or less bright depending upon what settings or values you entered in other fields.

- Help — The box on the upper-right half of both screens displays help information for the option with a currently highlighted field.
- System data — The box in the lower-right corner of both screens displays information about your system.
- Key functions — The line of boxes across the bottom of both screens lists keys and their functions within the System Setup program.

Figure 1. System Setup Screens

Dell Computer Corporation (www.dell.com)		BIOS Version A00
Page 1 of 2	System PowerVault 735N Setup	
Time: 18:05:46	Date: Wed Mar 14, 2001	This category sets the time in 24-hour format (hours:minutes:seconds) for the internal clock/calendar.
Diskette Drive A:	3.5 inch, 1.44 MB	
Num Lock:	On	To change the Value in a field, enter a number or use the left- or right-arrow key.
Speaker:	On	
System Alert:	Fault	Changes take effect immediately.
Processor Serial Number:	Disabled	
Processor Bus:	133 MHz	Pentium® III Processor - 866 MHz Level 2 Cache: 256 KB Advanced System Memory: 256 MB ECC SDRAM Video Memory: 4 MB SDRAM Service Tag: 1234567 Asset Tag: 1.235E+09
Processor 1:	A2	
Processor 2:	A2	
Tab,Shift-Tab change fields ←, → change values Alt-P next Esc exit Alt-B reboot		

Dell Computer Corporation (www.dell.com)		BIOS Version A00
Page 2 of 2	System PowerVault 735N Setup	
Keyboard Errors:	Report	This category sets whether keyboard-related error messages are reported at system startup. Changes take effect after reboot.
Boot Sequence:	Diskette First	
System Password:	Not Enabled	
Password Status:	Unlocked	
Setup Password:	Not Enabled	
----- Integrated Devices -----		
USB:	Enabled	Pentium® III Processor - 866 MHz Level 2 Cache: 256 KB Advanced System Memory: 256 MB ECC SDRAM Video Memory: 4 MB SDRAM Service Tag: 1234567 Asset Tag: 1.235E+09
Mouse:	On	
Serial Port 1:	Auto	
Serial Port 2:	Auto	
Parallel Port:	378h	
Parallel Mode:	PS/2	
Diskette:	Auto	
NIC:	On	
NIC MAC Address:	123456789012	
SCSI:	On	
Channel A:	SCSI	
Channel B:	SCSI	
IDE:	Auto	
Tab,Shift-Tab change fields ←, → change values Alt-P next Esc exit Alt-B reboot		


Dell Computer Corporation (www.dell.com)		BIOS Version A00
Device List	System PowerVault 735N Setup	
Boot Device Priority: Diskette Drive A: CD-ROM device Hard drive C: Exclude from Boot Device Priority: Device Controller Priority: System BIOS boot devices AIC-7899,A	The DEVICE LIST contains devices that may be bootable. The system attempts to boot from the devices in the list as ordered. If you ESC or ALT-B from this menu, the displayed order becomes the boot selection. Ctrl-Ins moves items between "Boot Device Priority" and "Exclude from Boot Device Priority" only. Change the order of items in the "Device Controller Priority" to choose the initialization order of devices that appear in the "Boot Device Priority" list.	
	Pentium® III Processor - 866 MHz Level 2 Cache: 256 KB Advanced System Memory: 256 MB ECC SDRAM Video Memory: 4 MB SDRAM Service Tag: 1234567 Asset Tag: 1.235E+09	
Tab,Shift-Tab change fields ←, → change values Alt-P next Esc exit Alt-B reboot		

System Setup Options

Table 1 lists the options on the System Setup screens.

Table 1. System Setup Options

Option	Function
Time	Resets the time on the system's internal clock.
Date	Resets the date on the system's internal calendar.
Diskette Drive A	Identifies the type of diskette drive installed in your system.
Num Lock	Determines whether the system boots with the <Num Lock> mode activated on keyboards (does not apply to 84-key keyboards).
Speaker	Turns the built-in speaker On (the default) or Off . A reboot is needed for a change to take effect.
System Alert	Sets System Alert to Fault (the default) or Warning .
Processor serial number	Disables (the default) or Enables the processor serial number feature.
Processor Bus	Displays the current processor bus speed (either 100 MHz or 133 MHz). There are no user selectable settings.
Processor 1 Processor 2	Displays the version or stepping number of each processor slot in the system. Displays unknown if the stepping number is unknown and Not installed if no processor is installed in the slot.

Keyboard Errors	Enables or disables the reporting of keyboard errors during POST.
Boot Sequence	Determines whether the system boots from Diskette First (the default), Hard-Disk Only , or Device List, Ctrl-→ . Press <Ctrl> and the right-arrow key to select from devices on the Device List screen.
System Password	Displays the current status of the password security feature. The settings are Not Enabled (the default), Enabled , and Disabled by Jumper .
Password Status	Prevents the system password from being changed or disabled at system start-up. Unlocked is the default setting.
Setup Password	Restricts access to the setup program. Overrides system password. The settings are Not Enabled (the default), Enabled , and Disabled by Jumper .
USB	The system's Universal Serial Bus (USB) ports can be Enabled (the default) or Disabled .
Mouse	The built-in PS/2-compatible mouse port can be Enabled (the default) or Disabled . Disabling the mouse allows an expansion card to use IRQ 12.
Serial Port 1 Serial Port 2	Configures the built-in serial ports. Options are Auto (the default) to automatically configure a port, a particular designation (COM1 or COM3 for Serial Port 1 ; COM2 or COM4 for Serial Port 2), or Off (port is disabled).
Parallel Port	Configures the built-in parallel port. The default address is 378h . Alternate addresses are 278h or 3BCh . Set to Off to disable the parallel port.  NOTE: Do not set Parallel Port to 278h if you have an <i>Extended Capabilities Port (ECP)</i> device connected to the port.
Parallel Mode	Controls whether the built-in parallel port acts as an AT -compatible (unidirectional) or PS/2 -compatible (bi-directional) port. Refer to the documentation that came with the device to determine the correct setting. PS/2 is the default.
Diskette	Controls the operation of the system's integrated diskette drive controller. Auto (the default) turns off the built-in diskette drive controller (when necessary) to accommodate a controller card installed in an expansion slot. Write Protect prevents anything from being written to diskette drives using the system's built-in diskette drive controller. Read access is enabled. When Write Protect is selected, Auto is also selected. Off turns off the integrated diskette controller for diagnostics testing.
NIC	Turns the integrated network interface controller (NIC) On (the default) or Off . A reboot is needed for a change to take effect.
NIC MAC Address	Displays the media access control (MAC) address used by the integrated NIC. This field has no user-selectable settings.
SCSI	If the integrated RAID controller is installed, turns the integrated SCSI Controller On or Off .

SCSI Channel A Channel B	When SCSI is set to On , Channel A and Channel B display SCSI . When SCSI is set to Off , Channel A and Channel B display Off .
IDE	Controls integrated IDE CD-ROM drive controller operation. If IDE is set to Auto and the system detects a drive controller card installed, the integrated IDE controller is disabled. If a drive controller card is not detected, the integrated IDE controller is enabled. When IDE Controller is set to Off , the integrated IDE controller is always disabled.
System Data:	These fields display information about the system and are not selectable.
Level 2 Cache	Displays the size of the integrated cache. This field has no user-selectable settings.
System Memory	Displays the amount of installed and detected memory, except for memory on EMS expansion cards.
Video Memory	Displays the amount of installed and detected video memory.
Service Tag	Displays the 5- or 7-character service tag number programmed into NVRAM.
Asset Tag	Displays the programmable asset tag number (if assigned).

Using the System Password Feature

NOTICE: The password features provide a basic level of security for the data on your system. However, they are not foolproof. If your data requires more security, it is your responsibility to obtain and use additional forms of protection, such as data encryption programs.

NOTICE: Dell recommends that the system password be left in the "Not Enabled" (default) setting. When your system operates in a headless configuration, you cannot input a system password to reboot the system.

Your Dell system is shipped to you without the system password feature enabled. If system security is a concern, you should attach a keyboard, monitor, and mouse to your system and enable password protection.

You can [assign a system password](#) whenever you use the System Setup program. After a system password is assigned, only those who know the password have full use of the system.

When the **System Password** option is set to **Enabled**, the system prompts you for the system password just after the system boots.

To change an existing system password, you must know the password (see "[Deleting or Changing an Existing System Password](#)"). If you assign and later forget a system password, you need to be able to remove the system cover to change a jumper setting that disables the system password feature (see "[Disabling a Forgotten Password](#)"). Note that you will erase the setup password at the same time.

NOTICE: If you leave your system running and unattended without having a system password assigned, or if you leave your system unlocked so that someone can disable the password by changing a jumper setting, anyone can access the data stored on your hard-disk drive.

Assigning a System Password

Before you can assign a system password, you must enter the System Setup program and check the **System Password** option.

When a system password is assigned, the setting shown for the **System Password** option is **Enabled**. When the system password feature is disabled by a jumper setting on the system board, the setting shown is **Disabled by Jumper**. You cannot change or enter a new system password if either of these settings is displayed.

When no system password is assigned and the password jumper on the system board is in the enabled position (the default setting), the setting shown for the **System Password** option is **Not Enabled**. Only when this option is set to **Not Enabled** can you assign a system password, using the following procedure:

1. Verify that the **Password Status** option is set to **Unlocked**.
For instructions on changing the setting for **Password Status**, see "[Password Status](#)."
2. Highlight the **System Password** option and then press the left- or right-arrow key.

The option heading changes to **Enter Password**, followed by an empty seven-character field in square brackets.

3. Type your new system password.

You can use up to seven characters in your password.

As you press each character key (or the spacebar key for a blank space), a placeholder appears in the field.

The password assignment operation recognizes keys by their location on the keyboard, without distinguishing between lowercase and uppercase characters. For example, if you have an *M* in your password, the system recognizes either *M* or *m* as correct.

Certain key combinations are not valid. If you enter one of these combinations, the speaker emits a beep.

To erase a character when entering your password, press the <Backspace> key or the left-arrow key.



NOTE: To escape from the field without assigning a system password, press the <Tab> key or the <Shift><Tab> key combination to move to another field, or press the <Esc> key at any time prior to completing step 5.

4. Press <Enter>.

If the new system password is less than seven characters, the whole field fills with placeholders. Then the option heading changes to **Verify Password**, followed by another empty seven-character field in square brackets.

5. To confirm your password, type it a second time and press <Enter>.

The password setting changes to **Enabled**. Your system password is now set; you can exit the System Setup program and begin using your system. Note, however, that password protection does not take effect until you reboot the system by pressing the reset button or by turning the system off and then on again.

Using Your System Password to Secure Your System

Whenever you turn on your system, press the reset button, or reboot the system by pressing the <Ctrl><Alt> key combination, the following prompt appears on the screen when the **Password Status** option is set to **Unlocked**:

```
Type in the password and... -- press <ENTER> to leave password security
enabled. -- press <CTRL><ENTER> to disable password security. Enter password:
```

If the **Password Status** option is set to **Locked**, the following prompt appears:

```
Type the password and press <Enter>.
```

After you type the correct system password and press <Enter>, your system boots and you can use the keyboard and/or mouse to operate your system as usual.



NOTE: If you have assigned a setup password (see "[Using the Setup Password Feature](#)"), the system accepts your setup password as an alternate system password.

If a wrong or incomplete system password is entered, the following message appears on the screen:

```
** Incorrect password. **
```

```
Enter password:
```

If an incorrect or incomplete system password is entered again, the same message appears on the screen.

The third and subsequent times an incorrect or incomplete system password is entered, the system displays the following message:

```
** Incorrect password. **
Number of unsuccessful password attempts: 3
System halted! Must power down.
```

The number of unsuccessful attempts made to enter the correct system password can alert you to an unauthorized person attempting to use your system.

Even after your system is turned off and on, the previous message is displayed each time an incorrect or incomplete system password is entered.



NOTE: You can use the **Password Status** option in conjunction with **System Password** and **Setup Password** to further protect your system from unauthorized changes. For more information, see "[Password Status](#)."

Deleting or Changing an Existing System Password

To delete or change an existing system password, perform the following steps:

1. Enter the System Setup program and verify that the **Password Status** option is set to **Unlocked**.

Enter the System Setup program by pressing the <F2> key. Press the <Alt><p> key combination to move to Page 2 of the System Setup screens. For instructions on changing the setting for **Password Status**, see "[Password Status](#)."

2. Reboot your system to force it to prompt you for a system password.
3. When prompted, type the system password.
4. Press the <Ctrl><Enter> key combination to disable the existing system password, instead of pressing <Enter> to continue with the normal operation of your system.
5. Confirm that **Not Enabled** is displayed for the **System Password** option of the System Setup program.

If **Not Enabled** appears for the **System Password** option, the system password has been deleted. If you want to assign a new password, continue to step 6.

If **Not Enabled** is not displayed for the **System Password** option, press the <Alt> key combination to reboot the system, and then repeat steps 3 through 5.

6. To assign a new password, follow the procedure in "[Assigning a System Password](#)."

Using the Setup Password Feature

Your Dell system is shipped to you without the setup password feature enabled. If system security is a concern, you should operate your system with setup password protection.


You can [assign a setup password](#) whenever you use the System Setup program. After a setup password is assigned, only those who know the password have full use of the System Setup program.

To change an existing setup password, you must know the setup password (see "[Deleting or Changing an Existing Setup Password](#)"). If you assign and later forget a setup password, you need to remove the system cover to change a jumper setting that [disables the setup password feature](#). Note that you erase the system password at the same time.

Assigning a Setup Password

A setup password can be assigned (or changed) only when the **Setup Password** option is set to **Not Enabled**. To assign a setup password, highlight the **Setup Password** option and press the left- or right-arrow key. The system prompts you to enter and verify the password. If a character is illegal for password

use, the system emits a beep.

 **NOTES:** *The setup password can be the same as the system password.*

If the two passwords are different, the setup password can be used as an alternate system password. However, the system password cannot be used in place of the setup password.

After you verify the password, the **Setup Password** setting changes to **Enabled**. The next time you enter the System Setup program, the system prompts you for the setup password.

A change to the **Setup Password** option becomes effective immediately (rebooting the system is not required).


Operating With a Setup Password Enabled

If **Setup Password** is set to **Enabled**, you must enter the correct setup password before you can modify the majority of the System Setup options.

When you start the System Setup program, Page 2 of the System Setup screens appears with the **Setup Password** option highlighted, prompting you to type the password.

If you do not enter the correct password in three tries, the system lets you view, but not modify, the System Setup screens—with the following exceptions:

- You can still modify the **Date**, **Time**, **CPU Speed**, **Num Lock**, and **Speaker** options.
- If System Password is not enabled and is not locked via the **Password Status** option, you can assign a system password (however, you cannot disable or change an existing system password).

 **NOTE:** *You can use the **Password Status** option in conjunction with **Setup Password** to protect the system password from unauthorized changes. For more information, see "[Password Status](#)."*

Deleting or Changing an Existing Setup Password

To delete or change an existing setup password, perform the following steps:

1. Enter the System Setup program.
2. Highlight the **Setup Password** option, and press the left- or right-arrow key to delete the existing setup password.

The setting changes to **Not Enabled**.

3. If you want to assign a new setup password, follow the procedure in "[Assigning a Setup Password](#)."

Disabling a Forgotten Password

If the administrator or user forgets the system or setup password, you cannot operate the system or change settings in the System Setup program until you change the password jumper setting to disable the

passwords, and erase the existing passwords.

To disable a forgotten supervisor password or setup password, perform the following steps.

NOTICE: See "[Protecting Against Electrostatic Discharge](#)."

1. Open the right-side [system cover](#).
2. Refer to "[System Board Jumpers](#)" for the location of the password jumper (labeled "PASSWD") on the system board.
3. Remove the jumper plug from the PASSWD jumper.
4. Close the system [doors](#) and then reconnect the system to an electrical outlet and turn it on.

The existing passwords are not disabled (erased) until the system boots with the PASSWD jumper plug removed. However, before you assign a new system and/or setup password, you must install the jumper plug.



NOTE: If you assign a new system and/or setup password with the jumper plug still removed, the system disables the new password(s) the next time it boots.

5. Repeat steps 1 through 4.
6. Install the jumper plug on the PASSWD jumper.
7. Replace the [system doors](#).
8. Assign a new system and/or setup password.

To assign a new system password using the System Setup program, see "[Assigning a System Password](#)." To assign a new setup password using the System Setup program, see "[Assigning a Setup Password](#)."

Responding to Error Messages

If an error message appears on your monitor screen while the system is booting, make a note of the message. Then, before entering the System Setup program, refer to "[System Beep Codes](#)" and "[System Messages \(POST Error Messages\)](#)" for an explanation of the message and suggestions for correcting any errors.

If you are given an option of pressing either <F1> to continue or <F2> to run the System Setup program, press the <F2> key.

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