Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

Notes, Notices, and Cautions

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

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

⚠ **CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.**

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the Glossary in your *User's Guide*.

Jumpers, Switches, and Connectors

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Jumpers—A General Explanation
- System Board Jumpers
- System Board Connectors
- SCSI Backplane Connectors
- Disabling a Forgotten Password

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

Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When reconfiguring the system, you may need to change jumper settings on circuit boards 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. Figure A-1 shows an example of a jumper.

Figure A-1. Example Jumper

A jumper is referred to as open or unjumpered 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 jumpered. The jumper setting is often shown in text as two numbers, such as 1–2. The number 1 is printed on the circuit board with a triangle so that you can identify each pin number based on the location of pin 1.

Figure A-2 shows the location and default settings of the server-module jumper blocks. See Table A-1 for the designations, default settings, and functions of the jumpers.

System Board Jumpers

Figure A-2 shows the location of the configuration jumpers on the system board. Table A-1 lists the jumper settings.

NOTE: To access the jumpers, remove the memory cooling shroud by lifting the release latch and sliding the shroud toward the front of the system. See Figure 6-1.

Figure A-2. System Board Jumpers

Table A-1. System Board Jumper Settings

Jumper	Setting	Description
PASSWD_EN	(default)	The password feature is enabled.
		The password feature is disabled.
NVRAM_CLR	(default)	The configuration settings in NVRAM are retained at system boot.
		The configuration settings in NVRAM are cleared at next system boot.

System Board Connectors

See Figure A-3 and Table A-2 for the location and description of the system board connectors.

Figure A-3. System Board Connectors
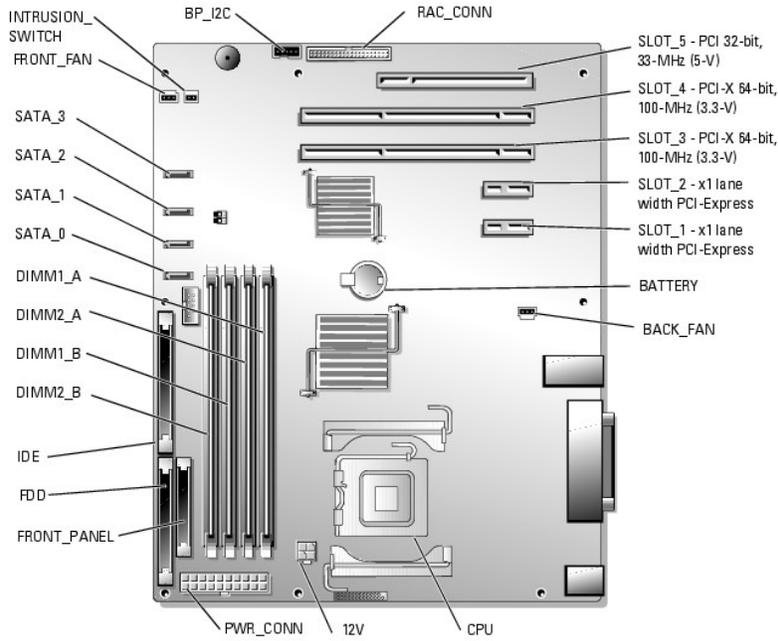
Table A-2. System Board Connectors

Connector	Description
12V	Power connector
BACK_FAN	Fan power connector
BATTERY	Connector for the 3.0-V coin battery
BP_I2C	Connector for the baseboard management controller (BMC) inter-IC (I2C) cable for the optional SCSI backplane
CPU	Processor connector
DIMM*n*_ *x*	Memory module connector (4)
FDD	Diskette drive connector
FRONT_FAN	Fan power connector
FRONT_PANEL	Control panel connector
IDE	IDE optical device connector
SLOT_*n*	PCI expansion slot connector
PWR_CONN	Power connector
RAC_CONN	Connector for the remote access controller (RAC)
SATA_*n*	SATA hard-drive connector

SCSI Backplane Connectors

See Figure A-4 for the location and description of the connectors on the back of the optional SCSI backplane board.

Figure A-4. Connectors on Back of SCSI Backplane
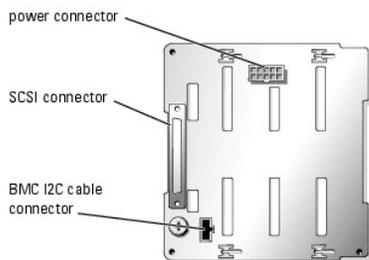
Disabling a Forgotten Password

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

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System" in "Troubleshooting Your System."

3. Remove the memory cooling shroud by lifting the release latch and sliding the shroud toward the front of the system. See Figure 6-1.

4. Remove the password jumper plug.

   See Figure A-2 to locate the password jumper on the system board.

5. Replace the memory cooling shroud.

6. Close the system. See "Closing the System" in "Troubleshooting Your System."

7. Reconnect the system to the electrical outlet, and turn on the system.

   The existing passwords are not disabled (erased) until the system boots with the password 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.

8. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

9. Open the system.

10. Remove the memory cooling shroud.

11. Reinstall the password jumper plug in its original position to enable the password protection feature.

12. Reinstall the memory cooling shroud.

13. Close the system, reconnect the system to the electrical outlet, and turn on the system.

14. Assign a new system and/or setup password.

    To assign a new password using the System Setup program, see "Using the System Setup Program" in your *User's Guide*.

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I/O Connectors

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Serial Connector
- Parallel Connector
- PS/2-Compatible Keyboard and Mouse Connectors
- Video Connector
- USB Connectors
- Integrated NIC Connectors
- Network Cable Requirements

I/O connectors are the gateways that the system uses to communicate with external devices, such as a keyboard, mouse, printer, or monitor. This section describes the various connectors on your system. If you reconfigure the hardware connected to the system, you may also need the pin number and signal information for these connectors. Figure B-1 illustrates the connectors on the system.

Figure B-1. I/O Connectors
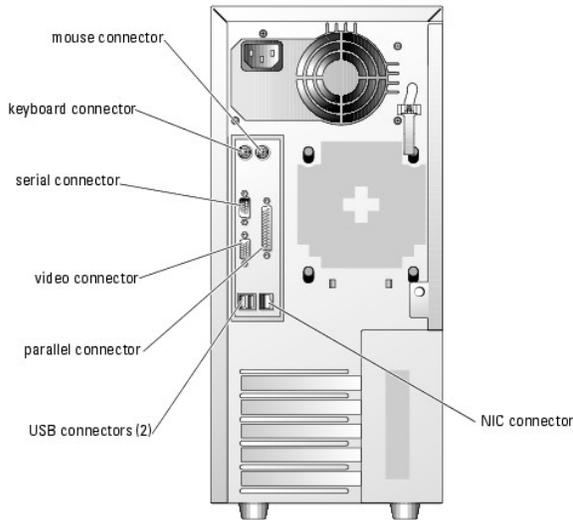
Table B-1 shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
IOIOI	Serial connector
🖹	Parallel connector
⊣⊟	Mouse connector
⌨	Keyboard connector
🖵	Video connector
⊷	USB connector
🖧	NIC connector

Serial Connector

Serial connectors support devices such as external modems, printers, and mice that require serial data transmission. The serial connector is also used by the BMC to provide remote access to the system. The serial connector uses a 9-pin D-subminiature connector.

Serial Connector Autoconfiguration

The default designation of the integrated serial connector is COM1. When you add an expansion card containing a serial connector that has the same designation as the integrated connector, the system's autoconfiguration feature remaps (reassigns) the integrated serial connector to the next available designation. Both the new and the remapped COM connectors share the same IRQ setting. COM1 and COM3 share IRQ4, while COM2 and COM4 share IRQ3.

NOTE: If two COM connectors share an IRQ setting, you may not be able to use them both at the same time. In addition, if you install one or more expansion cards with serial connectors designated as COM1 and COM3, the integrated serial connector is disabled.

Before adding a card that remaps the COM connectors, check the documentation that came with the software to make sure that the software can accommodate the new COM connector designation.

Figure B-2 illustrates the pin numbers for the serial connector and Table B-2 defines the pin assignments for the connector.

Figure B-2. Serial Connector Pin Numbers
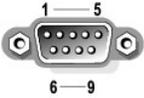
Table B-2. Serial Connector Pin Assignments

| Pin	Signal	I/O	Definition
1	DCD	I	Data carrier detect
2	SIN	I	Serial input
3	SOUT	O	Serial output
4	DTR	O	Data terminal ready
5	GND	N/A	Signal ground
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator
Shell	N/A	N/A	Chassis ground

Parallel Connector

The integrated parallel connector, intended primarily for use by printers that require data in parallel format, uses a 25-pin D-subminiature connector on the system's back panel. The default designation of the system's parallel connector is LPT1. If you add an expansion card containing a parallel connector configured as LPT1 (IRQ7, I/O address 378h), use the System Setup program to remap the integrated parallel connector. See "Using the System Setup Program" in the *User's Guide*. Figure B-3 illustrates the pin numbers for the parallel connector and Table B-3 defines the pin assignments for the connector.

Figure B-3. Parallel Connector Pin Numbers
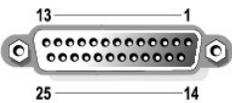
Table B-3. Parallel Connector Pin Assignments

Pin	Signal	I/O	Definition
1	STB#	I/O	Strobe
2	PD0	I/O	Printer data bit 0
3	PD1	I/O	Printer data bit 1
4	PD2	I/O	Printer data bit 2
5	PD3	I/O	Printer data bit 3
6	PD4	I/O	Printer data bit 4
7	PD5	I/O	Printer data bit 5
8	PD6	I/O	Printer data bit 6
9	PD7	I/O	Printer data bit 7
10	ACK#	I	Acknowledge

11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	AFD#	O	Automatic feed
15	ERR#	I	Error
16	INIT#	O	Initialize printer
17	SLIN#	O	Select in
18–25	GND	N/A	Ground

PS/2-Compatible Keyboard and Mouse Connectors

The PS/2-compatible keyboard and mouse cables attach to 6-pin, miniature DIN connectors. Figure B-4 illustrates the pin numbers for these connectors and Table B-4 defines the pin assignments for these connectors.

Figure B-4. PS/2-Compatible Keyboard and Mouse Connector Pin Numbers

Table B-4. Keyboard and Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	KBDATA or MDATA	I/O	Keyboard data or mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	KBCLK or MCLK	I/O	Keyboard clock or mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Video Connector

You can attach a VGA-compatible monitor to the system's integrated video controller using a 15-pin high-density D-subminiature connector on the system front or back panel. Figure B-5 illustrates the pin numbers for the video connector and Table B-5 defines the pin assignments for the connector.

NOTE: Installing a video card automatically disables the system's integrated video controller.

Figure B-5. Video Connector Pin Numbers

Table B-5. Video Connector Pin Assignments

Pin	Signal	I/O	Definition
1	RED	O	Red video
2	GREEN	O	Green video
3	BLUE	O	Blue video
4	NC	N/A	No connection
5–8, 10	GND	N/A	Signal ground
9	VCC	N/A	Vcc
11	NC	N/A	No connection
12	DDC data out	O	Monitor detect data

13	HSYNC	O	Horizontal synchronization
14	VSYNC	O	Vertical synchronization
15	NC	N/A	No connection

USB Connectors

The system's USB connectors support USB-compliant peripherals such as keyboards, mice, and printers and may also support USB-compliant devices such as diskette drives and optical drives. <u>Figure B-6</u> illustrates the pin numbers for the USB connector and <u>Table B-6</u> defines the pin assignments for the connector.

⬤ **NOTICE:** Do not attach a USB device or a combination of USB devices that draw a maximum current of more than 500 mA per channel or +5 V. Attaching devices that exceed this threshold may cause the USB connectors to shut down. See the documentation that accompanied the USB devices for their maximum current ratings.

Figure B-6. USB Connector Pin Numbers

Table B-6. USB Connector Pin Assignments

Pin	Signal	I/O	Definition
1	Vcc	N/A	Supply voltage
2	DATA	I	Data in
3	+DATA	O	Data out
4	GND	N/A	Signal ground

Integrated NIC Connectors

Each of the system's integrated NICs function as a separate network expansion card while providing fast communication between servers and workstations. <u>Figure B-7</u> illustrates the pin numbers for the NIC connector and <u>Table B-7</u> defines the pin assignments for the connectors.

Figure B-7. NIC Connector
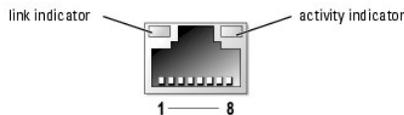
Table B-7. NIC Connector Pin Assignments

Pin	Signal	I/O	Definition
1	TD+	O	Data out (+)
2	TD−	O	Data out (−)
3	RD+	I	Data in (+)
4	NC	N/A	No connection
5	NC	N/A	No connection
6	RD−	I	Data in (−)
7	NC	N/A	No connection
8	NC	N/A	No connection

Network Cable Requirements

The NIC supports a UTP Ethernet cable equipped with a standard RJ45-compatible plug.

Observe the following cabling restrictions.

NOTICE: To avoid line interference, voice and data lines must be in separate sheaths.

l   Use Category 5 or greater wiring and connectors.

l   Do not exceed a cable run length (from a workstation to a hub) of 100 m (328 ft).

For detailed guidelines on operation of a network, see "Systems Considerations of Multi-Segment Networks" in the IEEE 802.3 standard.

Introduction

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

● Other Documents You May Need

Your system includes the following service and upgrade features:

l   Embedded server management hardware, which monitors temperatures and voltages throughout the system

l   System diagnostics, which checks for hardware problems (if the system can boot)

System upgrade options are offered, including:

l   Microprocessors

l   Additional system memory

l   A variety of PCI, PCI-X, and PCIe expansion-card options (including SCSI and SATA RAID controller cards)

l   Optional remote access card for remote systems management

l   Tape backup units

l   Diskette drive

l   Additional SATA or SCSI hard drives

l   Optional SCSI backplane bay to support up to four front-access non-hot-plug SCSI hard drives (SCSI controller required) or hot-plug SCSI drives (optional SCSI RAID controller required)

Other Documents You May Need

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

l   The *Getting Started Guide* provides an overview of initially setting up your system.

l   The *User's Guide* provides information about system features and technical specifications.

l   Systems management software documentation describes the features, requirements, installation, and basic operation of the software.

l   Operating system documentation describes how to install (if necessary), configure, and use the operating system software.

l   Documentation for any components you purchased separately provides information to configure and install these options.

l   Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

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

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

Indicators, Messages, and Codes
Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Front-Panel Indicators and Features
- Back-Panel Features and Indicators
- SCSI Hard-Drive Indicator Codes
- Power Indicator Codes
- NIC Indicator Codes
- Diagnostics Indicator Codes
- System Messages
- System Beep Codes
- Warning Messages
- Diagnostics Messages
- Alert Messages
- Baseboard Management Controller Messages

The system, applications, and operating systems can identify problems and alert you to them. Any of the following can indicate when the system is not operating properly:

- System indicators
- System messages
- Beep codes
- Warning messages
- Diagnostics messages
- Alert messages

This section describes each type of message, lists the possible causes, and provides steps to resolve any problems indicated by a message. The system indicators and features are illustrated in this section.

Front-Panel Indicators and Features

System Status Indicators

The system front panel incorporates blue and amber system status indicators. The blue indicator lights up when the system is operating correctly. The amber indicator lights up when the system needs attention due to a problem with power supplies, fans, system temperature, or hard drives.

Table 2-1 lists the system's indicator patterns. Different patterns are displayed as events occur in the system.

Table 2-1. System Status Indicator Patterns

Blue and Amber System Status Indicator	Description
Off	Power is not available to the system.
Amber indicator is blinking.	The system has detected an error. See "System Messages" and "Troubleshooting Your System" for more information.
Blue indicator is on. Amber indicator is off	Power is on, and the system is operational.

Figure 2-1 shows the controls, indicators, and connectors located behind the optional bezel on the system's front panel. Table 2-2 describes the front-panel features.

Figure 2-1. Front-Panel Features and Indicators
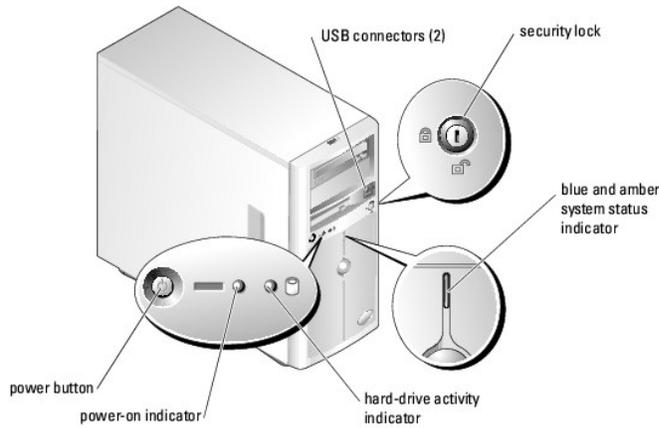
Table 2-2. Front-Panel Indicators, Buttons, and Connectors

Indicator, Button, or Connector	Description
Blue and amber system status indicator	The blue system status indicator lights during normal system operation. The amber system status indicator flashes when the system needs attention due to a problem with power supplies, fans, system temperature, or hard drives. **NOTE:** If the system is connected to AC power and an error has been detected, the amber system status indicator flashes regardless of whether the system has been powered on.
Power button	Turns system power off and on. l If you turn off the system using the power button and the system is running an ACPI-compliant operating system, the system can perform an orderly shutdown before power is turned off. If the power button is pressed for more than 4 seconds, the system power will turn off regardless of the current operating system state. l If the system is not running an ACPI-compliant operating system, power is turned off immediately after the power button is pressed. The power button is enabled in the System Setup program. When disabled, the button can only turn the system power on. For more information, see "Using the System Setup Program" in your *User's Guide*, and the operating system's documentation.
Power-on indicator	The power-on indicator lights when the system power is on. When the indicator is off, the system is off. To exit from a power-saving state, briefly press the power button or click or move the mouse.
Hard-drive activity indicator	Flashes when data is being read from or written to the internal SATA hard drives that are connected to the integrated controller.
USB connectors	Connects USB 2.0-compliant devices to the system.

Back-Panel Features and Indicators

Figure 2-2 shows the controls, indicators, and connectors located on the system's back panel.

Figure 2-2. Back-Panel Features and Indicators
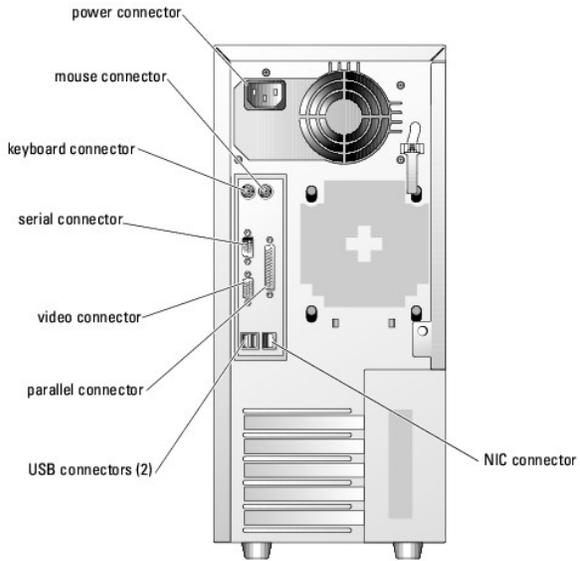
SCSI Hard-Drive Indicator Codes

If an optional SCSI RAID controller is installed in the system, two indicators on each of the hard-drive carriers provide information on the status of the SCSI hard drives. See Figure 2-3 and Table 2-3. The SCSI backplane firmware controls the drive power-on/fault indicator.

Figure 2-3. SCSI Hard-Drive Indicators
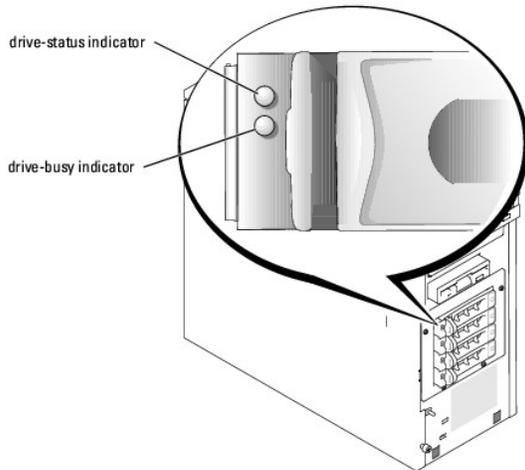
Table 2-3 lists the drive indicator patterns. Different patterns are displayed as drive events occur in the system. For example, if a hard drive fails, the "drive failed" pattern appears. After the drive is selected for removal, the "drive being prepared for removal" pattern appears, followed by the "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.

NOTE: If a RAID controller is not installed, only the "drive online" indicator pattern appears. The drive-activity indicator also blinks when the drive is being accessed.

Table 2-3. Hard-Drive Indicator Patterns

Condition	Indicator Pattern
Identify drive	The green power-on/fault indicator blinks four times per second.
Drive being prepared for removal	The green power-on/fault indicator blinks two times per second.
Drive ready for insertion or removal	Both drive indicators are off.
Drive being prepared for operation	The green power-on/fault indicator is on.

Drive predicted failure	The power-on/fault indicator slowly blinks green, amber, and off.
Drive failed	The amber power-on/fault indicator blinks four times per second.
Drive rebuilding	The green power-on/fault indicator blinks slowly.
Drive online	The green power-on/fault indicator is on.

Power Indicator Codes

The power button on the front panel controls the power input to the system's power supplies. The power indicator can provide information on power status (see Figure 2-1). Table 2-4 lists the power button indicator codes.

Table 2-4. Power Button Indicators

Indicator	Function
On	Indicates that power is supplied to the system and the system is operational.
Off	Indicates that no power is supplied to the system.
Blinking	Indicates that power is supplied to the system, but the system is in a standby state. For information on standby states, see your operating system documentation.

NIC Indicator Codes

Figure 2-4. NIC Indicators
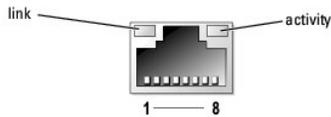
Table 2-5. NIC Indicators

Link indicator	Activity indicator	Description
Off	Off	The NIC is not connected to the network or the NIC is disabled in the System Setup screen. See "Using the System Setup Program" in your *User's Guide*.
Green	Off	Indicates that the network adapter is connected to a valid link partner on the network, but data is not currently being sent or received.
Green	Blinking amber	Indicates that network data is being sent or received.

Diagnostics Indicator Codes

The four diagnostics indicators on the system front panel display error codes during system startup. Table 2-6 details the conditions associated with the diagnostic indicator codes.

Table 2-6. Diagnostic Indicator Codes

Code	Causes	Corrective Action
A B C D	A possible processor failure has occurred.	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."
A B C D	Memory failure.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A B C D	Possible expansion-card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
A B C D	Possible video card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."

Indicator (A B C D)	Cause	Corrective Action
A B C D	Diskette or hard-drive failure.	Ensure that the diskette drive and hard drive(s) are properly connected. See "Installing Drives" for information on the drive(s) installed in your system.
A B C D	Possible USB failure.	See "Troubleshooting a USB Device" in "Troubleshooting Your System."
A B C D	No memory modules detected.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A B C D	System board failure.	See "Getting Help."
A B C D	Memory configuration error.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A B C D	Possible system board resource and/or system board hardware failure.	See "IRQ Assignment Conflicts" in "Finding Software Solutions." If the problem persists, see "Getting Help."
A B C D	Possible expansion card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
A B C D	Other failure.	Ensure that the diskette drive, optical drive, and hard drive(s) are properly connected. See "Troubleshooting Your System" for the appropriate drive(s) installed in your system.\n\nIf the problem persists, see "Getting Help."
A B C D	The system is in a normal operating condition after POST.	Information only.

🟡 = yellow
🟢 = green
⚪ = off

System Messages

System messages appear on the screen during system boot to notify you of a possible problem with the system. Table 2-7 lists the system messages that can occur and the probable cause and corrective action for each message.

NOTE: If you receive a system message that is not listed in Table 2-7, check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-7. System Messages

Message	Causes	Corrective Actions
Amount of available memory limited to 256MB!	**OS Install Mode** is enabled in the System Setup program.	Disable **OS Install Mode** in the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
Attempting to update Remote Configuration. Please wait....	Remote Configuration is in progress.	Wait until the process is complete.
BIOS Update Attempt Failed	BIOS remote update failed.	Retry update.
Caution! NVRAM_CLR jumper is installed on system board.	NVRAM_CLR jumper is installed.	Remove the NVRAM_CLR jumper. See Figure A-2 for the jumper location.
CD-ROM drive not found	Improperly connected or missing optical drive.	If no optical drive is installed, disable the IDE controller. See "Using the System Setup Program" in your *User's Guide*.\n\nIf an optical drive is installed, see "Troubleshooting an Optical Drive" in "Troubleshooting Your System."
Decreasing available memory	Faulty or improperly installed memory modules.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System."
Diskette drive 0 seek failure	Incorrect configuration settings in System Setup program.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
	Faulty or improperly installed diskette, loose diskette drive	Replace the diskette. Ensure that the diskette drive and optical drive cables are properly connected. See "Troubleshooting a Diskette Drive" and

	or optical drive interface cable, or loose power cable.	"Troubleshooting an Optical Drive" in "Troubleshooting Your System."
Diskette read failure	Faulty or improperly inserted diskette.	Replace the diskette.
Diskette subsystem reset failed	Faulty diskette drive or optical drive controller.	Ensure that the diskette drive and optical drive cables are properly connected. See "Troubleshooting a Diskette Drive" and "Troubleshooting an Optical Drive" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Drive not ready	Diskette missing or improperly inserted in diskette drive.	Reinsert or replace the diskette.
Dual rank DIMMs are not supported in the following memory sockets in this memory configuration.	Invalid memory configuration.	Correct the memory configuration. See "General Memory Module Installation Guidelines" in "Installing System Components."
Error: Incorrect memory configuration. Ensure memory in slots DIMM1_A and DIMM1_B, DIMM2_A and DIMM2_B match identically in size, speed, and rank.	An unmatched pair of memory modules is installed.	Install a matched pair of memory modules, or remove the memory module in socket DIMM1_B. See "General Memory Module Installation Guidelines" in "Installing System Components."
Error: Remote Access Card initialization failure.	Faulty or improperly installed RAC.	Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System," or "Installing a RAC Card" in "Installing System Components."
Error 8602: Auxiliary device failure. Verify that the keyboard and mouse are securely attached to correct connectors.	Loose or improperly connected mouse or keyboard cable; faulty mouse or keyboard.	Replace the mouse. If the problem persists, replace the keyboard.
Gate A20 failure	Faulty keyboard controller (faulty system board).	See "Getting Help."
General failure	Operating system corrupted or improperly installed.	Reinstall the operating system.
IDE Primary drive 1 not found	Improperly connected or missing optical drive or tape backup unit.	Ensure that the drive cables are properly connected. See "Troubleshooting Your System" for the appropriate drive installed in your system. If no drive is installed, disable the IDE controller. See "Using the System Setup Program" in your *User's Guide*.
Keyboard controller failure	Faulty keyboard controller (faulty system board).	See "Getting Help"
Keyboard data line failure Keyboard failure Keyboard stuck key failure	Loose or improperly connected keyboard cable; faulty keyboard; faulty keyboard controller.	Ensure that the keyboard is properly connected. If the problem persists, replace the keyboard. If the problem persists, see "Getting Help."
Keyboard fuse has failed.	Keyboard fuse has failed.	Replace the keyboard. Faulty system board. See "Getting Help."
Manufacturing mode detected	System is incorrectly configured.	After the message appears during system boot, press <Alt><F> to turn off manufacturing mode.
Memory address line failure at *address*, read *value* expecting *value* Memory double word logic failure at *address*, read *value* expecting *value* Memory odd/even logic failure at *start address* to *end address* Memory write/read failure at *address*, read *value* expecting *value*	Faulty or improperly installed memory modules, or faulty system board.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Memory tests terminated by keystroke	The spacebar was pressed during POST to terminate the memory test.	Information only.
No boot device available	Faulty or missing diskette drive, optical drive, or hard drive.	Check the **Integrated Devices** configuration settings in the System Setup program. See "Using the System Setup Program" in your *User's Guide*. Ensure that either **SATA Controller**, **Diskette Controller**, or **IDE Controller** is enabled. If the system is booting from a SCSI controller, ensure that the controller is properly connected. If the problem persists, replace the drive. See "Installing Drives."
No boot sector on hard-disk drive	An operating system is not on the hard drive.	Check the hard-drive configuration settings in the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
No timer tick interrupt	Faulty system board.	See "Getting Help."
Not a boot diskette	Not a bootable diskette.	Use a bootable diskette.
PCI BIOS failed to install	Loose cables to expansion card(s); faulty or improperly installed expansion card.	Ensure that all appropriate cables are securely connected to the expansion cards. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
PCIe Degraded Link Width Error: Embedded Bus#*nn*/Dev#*nn*/Func*n* Expected Link Width is *n*	Faulty or improperly installed PCIe card.	Reseat the PCIe cards. See "Expansion Cards." If the problem persists, see "Getting Help."

Actual Link Width is *n*		
PCIe Degraded Link Width Error: Slot *n* Expected Link Width is *n* Actual Link Width is *n*	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See "Expansion Cards." If the problem persists, see "Getting Help."
PCIe Training Error: Embedded Bus#*nn*/Dev#*nn*/Func*n*	Faulty or improperly installed PCIe card.	Reseat the PCIe cards. See "Expansion Cards." If the problem persists, see "Getting Help."
PCIe Training Error: Slot *n*	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See "Expansion Cards." If the problem persists, see "Getting Help."
Plug & Play Configuration Error	Error encountered in initializing PCI device; faulty system board.	Install the NVRAM_CLR jumper and reboot the system. See Figure A-2 for jumper location. Check for a BIOS update. If the problem persists, see "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Read fault Requested sector not found	Faulty diskette, diskette drive, optical drive, or hard drive.	Replace the diskette. Ensure that the diskette, optical, and hard-drive cables are properly connected. See "Troubleshooting a Diskette Drive," "Troubleshooting an Optical Drive," "Troubleshooting SATA Hard Drives," or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.
Remote Configuration update attempt failed	System could not implement Remote Configuration request.	Retry Remote Configuration.
ROM bad checksum = *address*	Faulty or improperly installed expansion card.	Remove and reseat the expansion cards. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
SATA Port *n* hard disk not found	SATA hard drive not connected to port *n*.	Ensure that the hard-drive cable is properly connected. See "Cabled SATA and SCSI Hard Drives" in "Installing Drives." If a drive is not connected to port *n*, check that the SATA port is disabled in the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
Sector not found Seek error Seek operation failed	Faulty diskette or hard drive.	Replace the diskette. If the problem persists, see "Troubleshooting SATA Hard Drives" or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive installed in your system.
Shutdown failure	Shutdown test failure.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
The amount of system memory has changed.	Faulty memory module.	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
	Information only, if you have changed the memory configuration.	
The amount of tested memory is below the minimum system configuration. System halted!	Invalid memory configuration or faulty memory module.	See "General Memory Module Installation Guidelines" in "Installing System Components." See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Time-of-day clock stopped	Faulty battery; faulty system board.	See "Troubleshooting the System Battery" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Time-of-day not set - please run SETUP program	Incorrect **Time** or **Date** settings; faulty system battery.	Check the **Time** and **Date** settings See "Using the System Setup Program" in your *User's Guide*. If the problem persists, see "Troubleshooting the System Battery" in "Troubleshooting Your System."
Timer chip counter 2 failed	Faulty system board.	See "Getting Help."
Unexpected interrupt in protected mode	Faulty or improperly installed memory modules or faulty system board.	Ensure that all memory modules are properly installed. See "General Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, see "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Unsupported CPU stepping detected	Processor is not supported by the system.	Check for a BIOS update using the Dell Support website at **support.dell.com**. If the problem persists, install a supported processor. See "Installing a Processor" in "Installing System Components."
Utility partition not available	<F10> key was pressed during POST, but no utility partition exists on the boot hard drive.	Create a utility partition on the boot hard drive. See "Using the Dell OpenManage Server Assistant CD" in your *User's Guide*.
Warning! No microcode update loaded for processor *n*	Unsupported processor.	Update the BIOS firmware using the Dell Support website at **support.dell.com**.
Write fault Write fault on selected drive	Faulty diskette, diskette drive, optical drive, hard drive.	Replace the diskette. Ensure that the diskette drive, optical drive, and hard-drive cables are properly connected. See "Troubleshooting a Diskette Drive," "Troubleshooting an Optical Drive," or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.

System Beep Codes

If an error that cannot be reported on the screen occurs during POST, the system may emit a series of beeps that identifies the problem.

NOTE: If the system boots without a keyboard, mouse, or monitor attached, the system does not issue beep codes related to those peripherals.

If a beep code is emitted, write down the series of beeps and then look it up in Table 2-8. If you are unable to resolve the problem by looking up the meaning of the beep code, use system diagnostics to identify the possible cause. If you are still unable to resolve the problem, see "Getting Help."

Table 2-8. System Beep Codes

Code	Cause	Corrective Action
1-1-2	CPU register test failure	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."
1-1-3	CMOS write/read failure; faulty system board	Faulty system board. See "Getting Help."
1-1-4	BIOS error	Reflash the BIOS.
1-2-1	Programmable interval-timer failure; faulty system board	Faulty system board. See "Getting Help."
1-2-2	DMA initialization failure	See "Troubleshooting System Memory" in "Troubleshooting Your System."
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	
1-3-2	No memory installed	
1-3-3	Chip or data line failure in the first 64 KB of main memory	
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	
1-4-3	Fail-safe timer test failure	
1-4-4	Software NMI port test failure	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	Faulty system board. See "Getting Help."
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-2	Interrupt vector loading failure	
3-2-4	Keyboard-controller test failure	
3-3-1	CMOS failure	
3-3-2	System configuration check failure	
3-3-3	Keyboard controller not detected	
3-3-4	Video memory test failure	
3-4-1	Screen initialization failure	
3-4-2	Screen-retrace test failure	
3-4-3	Video ROM search failure	
4-2-1	No timer tick	Faulty system board. See "Getting Help."
4-2-2	Shutdown test failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
4-3-1	Improperly installed or faulty memory modules	See "Troubleshooting System Memory" in "Troubleshooting Your System."
4-3-2	No memory modules installed in the first memory module connector	Install a memory module in the first memory module connector. See "System Memory" in "Installing System Components."
4-3-3	Faulty system board	Faulty system board. See "Getting Help."
4-3-4	Time-of-day clock stopped	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
4-4-1	Super I/O chip failure; faulty system board	Faulty system board. See "Getting Help."
4-4-4	Cache test failure; faulty processor	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."

Warning Messages

A warning message alerts you to a possible problem and prompts you to respond before the system continues a task. For example, before you format a diskette, a message will warn you that you may lose all data on the diskette. Warning messages usually interrupt the task and require you to respond by typing y (yes) or n (no).

NOTE: Warning messages are generated by either the application or the operating system. For more information, see "Finding Software Solutions" and the documentation that accompanied the operating system or application.

Diagnostics Messages

When you run system diagnostics, an error message may result. Diagnostic error messages are not covered in this section. Record the message on a copy of the Diagnostics Checklist in "Getting Help," and then follow the instructions in that section for obtaining technical assistance.

Alert Messages

Systems management software generates alert messages for your system. Alert messages include information, status, warning, and failure messages for drive, temperature, fan, and power conditions. For more information, see the systems management software documentation.

Baseboard Management Controller Messages

The Baseboard Management Controller (BMC) enables you to configure, monitor, and recover systems remotely. BMC uses the system's serial port and integrated NIC1 to support fault logging and SNMP alerting.

NOTE: If the integrated network controller is used in an Ether Channel team or link aggregation team, the BMC management traffic will not function properly. For more information about network teaming, see the documentation for the network controller.

For additional information on using BMC, see the documentation for the BMC and systems management applications.

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Finding Software Solutions

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Before You Begin
- Troubleshooting Errors and Conflicts

Software problems can be caused by:

- Improper installation or configuration of an application
- Application conflicts
- Input errors
- Interrupt assignment conflicts

Ensure that you are installing the software application according to the software manufacturer's recommended procedures. If a problem occurs after you install the software, you might need to troubleshoot your software application and your system.

See the documentation that accompanied the software or contact the software manufacturer for detailed troubleshooting information.

NOTE: If all of the system diagnostic tests complete successfully, then the problem is most likely caused by the software and not the hardware.

Before You Begin

- Scan the software media with antivirus software.
- Read the software documentation before you run the installation utility.
- Be prepared to respond to prompts from the installation utility.

  The installation utility may require you to enter information about your system, such as how the operating system is configured, and the type of peripherals that are connected to the system. Have this information available before running the installation utility.

Troubleshooting Errors and Conflicts

While configuring and running software, problems might occur that are caused by input errors, application conflicts, and/or IRQ assignment conflicts. The problems are sometimes indicated by error messages.

Error messages are generated by system hardware or software. "Indicators, Messages, and Codes" provides information about error messages that are hardware-based. If you receive an error message that is not listed, see your operating system or software program documentation for troubleshooting information.

Input Errors

Pressing a specific key or set of keys at the wrong time may produce unexpected results. See the documentation that came with the software application to ensure that the values or characters you are entering are valid.

Ensure that your operating system is configured properly to run the application. Remember that whenever you change the parameters of the operating system, the changes can conflict with an application's operating requirements. After you configure the operating system, you may need to reinstall or reconfigure a software application so that it can run properly in its new environment.

Application Conflicts

Some applications can leave unnecessary files or data behind after they are deleted from your system. Device drivers can also create application errors. If application errors occur, see your application device driver or operating system documentation for troubleshooting information.

IRQ Assignment Conflicts

Most PCI devices can share an IRQ, but they cannot use an IRQ simultaneously. To avoid this type of conflict, see the documentation for each PCI device for specific IRQ requirements.

Table 3-1. IRQ Assignment Defaults

IRQ Line	Assignment
IRQ0	System timer
IRQ1	Keyboard controller

IRQ2	Interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	*Available*
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	Remote access controller
IRQ6	Diskette drive controller
IRQ7	Parallel port
IRQ8	Real-time clock
IRQ9	ACPI functions (used for power management)
IRQ10	*Available*
IRQ11	*Available*
IRQ12	PS/2 mouse port unless the mouse is disabled through the System Setup program
IRQ13	Math coprocessor
IRQ14	IDE optical drive controller
IRQ15	*Available*

Running the System Diagnostics

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Using Server Administrator Diagnostics
- System Diagnostics Features
- When to Use the System Diagnostics
- Running the System Diagnostics
- System Diagnostics Testing Options
- Using the Custom Test Options

If you experience a problem with your system, run the diagnostics before calling for technical assistance. The purpose of the diagnostics is to test your system's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use diagnostics test results to help you solve the problem.

Using Server Administrator Diagnostics

To assess a system problem, first use the online Server Administrator diagnostics. If you are unable to identify the problem, then use the system diagnostics.

To access the online diagnostics, log into the Server Administrator home page, and then click the **Diagnostics** tab. For information about using diagnostics, see the online help. For additional information, see the *Server Administrator User's Guide*.

System Diagnostics Features

The system diagnostics provides a series of menus and options for particular device groups or devices. The system diagnostics menus and options allow you to:

- Run tests individually or collectively.
- Control the sequence of tests.
- Repeat tests.
- Display, print, or save test results.
- Temporarily suspend testing if an error is detected or terminate testing when a user-defined error limit is reached.
- View help messages that briefly describe each test and its parameters.
- View status messages that inform you if tests are completed successfully.
- View error messages that inform you of problems encountered during testing.

When to Use the System Diagnostics

If a major component or device in the system does not operate properly, component failure may be indicated. As long as the microprocessor and the system's input/output devices (monitor, keyboard, and diskette drive) are functioning, you can use the system diagnostics to help identify the problem.

Running the System Diagnostics

The system diagnostics is run from the utility partition on your hard drive.

> **NOTICE:** Use the system diagnostics to test only your system. Using this program with other systems may cause invalid results or error messages. In addition, use only the program that came with your system (or an updated version of that program).

1. As the system boots, press <F10> during POST.

2. From the utility partition main menu, select **Run System Diagnostics**, or select **Run Memory Diagnostics** if you are troubleshooting memory.

When you start the system diagnostics, a message is displayed stating that the diagnostics are initializing. Next, the **Diagnostics** menu appears. The menu allows you to run all or specific diagnostics tests or to exit the system diagnostics.

> **NOTE:** Before you read the rest of this section, start the system diagnostics so that you can see the utility on your screen.

System Diagnostics Testing Options

Click the testing option in the **Main Menu** window. Table 4-1 provides a brief explanation of testing options.

Table 4-1. System Diagnostics Testing Options

Testing Option	Function
Express Test	Performs a quick check of the system. This option runs device tests that do not require user interaction. Use this option to quickly identify the source of your problem.
Extended Test	Performs a more thorough check of the system. This test can take an hour or longer.
Custom Test	Tests a particular device.
Information	Displays test results.

Using the Custom Test Options

When you select **Custom Test** in the **Main Menu** window, the **Customize** window appears and allows you to select the device(s) to be tested, select specific options for testing, and view the test results.

Selecting Devices for Testing

The left side of the **Customize** window lists devices that can be tested. Devices are grouped by device type or by module, depending on the option you select. Click the **(+)** next to a device or module to view its components. Click **(+)** on any component to view the tests that are available. Clicking a device, rather than its components, selects all of the components of the device for testing.

Selecting Diagnostics Options

Use the **Diagnostics Options** area to select how you want to test a device. You can set the following options:

- **Non-Interactive Tests Only** — When checked, runs only tests that require no user intervention.
- **Quick Tests Only** — When checked, runs only the quick tests on the device. Extended tests will not run when you select this option.
- **Show Ending Timestamp** — When checked, time stamps the test log.
- **Test Iterations** — Selects the number of times the test is run.
- **Log output file pathname** — When checked, enables you to specify where the test log file is saved.

Viewing Information and Results

The tabs in the **Customize** window provide information about the test and the test results. The following tabs are available:

- **Results** — Displays the test that ran and the result.
- **Errors** — Displays any errors that occurred during the test.
- **Help** — Displays information about the currently selected device, component, or test.
- **Configuration** — Displays basic configuration information about the currently selected device.
- **Parameters** — If applicable, displays parameters that you can set for the test.

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Troubleshooting Your System

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

Safety First—For You and Your System

To perform certain procedures in this document, you must remove the system cover and work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in your system documentation.

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

Start-Up Routine

Look and listen during the system's start-up routine for the indications described in Table 5-1.

Table 5-1. Start-Up Routine Indications

Look/listen for:	Action
An error message displayed on the monitor.	See "System Messages" in "Indicators, Codes, and Messages."
A series of beeps emitted by the system.	See "System Beep Codes" in "Indicators, Codes, and Messages."
Alert messages from the systems management software.	See the systems management software documentation.
The monitor's power indicator.	See "Troubleshooting the Video Subsystem."
The keyboard indicators.	See "Troubleshooting the Keyboard."
The diskette drive activity indicator.	See "Troubleshooting a Diskette Drive."
The optical drive activity indicator.	See "Troubleshooting an Optical Drive."
The hard-drive activity indicator.	See "Troubleshooting SCSI Hard Drives."
An unfamiliar constant scraping or grinding sound when you access a drive.	See "Getting Help."

Checking Basic Power Problems

1. If the power indicator on the system front panel or power supply does not indicate that power is available to the system, ensure that the power cable is securely connected to the power supply.

2. If the system is connected to a PDU or UPS, turn the PDU or UPS off and then on.

3. If the PDU or UPS is not receiving power, plug it into another electrical outlet. If it still is not receiving power, try another PDU or UPS.

4. Reconnect the system to the electrical outlet and turn on the system.

If the system still is not working properly, see "Troubleshooting a Power Supply."

Checking the Equipment

This section provides troubleshooting procedures for external devices attached to the system, such as the monitor, keyboard, or mouse. Before you perform

any of the procedures, see "Troubleshooting External Connections."

Troubleshooting External Connections

Loose or improperly connected cables are the most likely source of problems for the system, monitor, and other peripherals (such as a printer, keyboard, mouse, or other external device). Ensure that all external cables are securely attached to the external connectors on your system. See Figure 2-1 and Figure 2-2 for the front-panel and back-panel connectors on your system.

Troubleshooting the Video Subsystem

Problem

- l   Monitor is not working properly.
- l   Video memory is faulty.

Action

1. Check the system and power connections to the monitor.

2. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

    If the tests run successfully, the problem is not related to video hardware. See "Finding Software Solutions."

    If the tests fail, see "Getting Help."

Troubleshooting the Keyboard

Problem

- l   System message indicates a problem with the keyboard.
- l   Keyboard is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Examine the keyboard and its cable for signs of damage.

3. Swap the faulty keyboard with a working keyboard.

    If the problem is resolved, replace the faulty keyboard.

4. If the keyboard is a USB keyboard, enter the System Setup program and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide*.

    If the problem is not resolved, see "Getting Help."

Troubleshooting the Mouse

Problem

- l   System message indicates a problem with the mouse.
- l   Mouse is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

   If the test fails, continue to the next step.

2. Examine the mouse and its cable for signs of damage.

   If the mouse is not damaged, go to step 5.

   If the mouse is damaged, continue to the next step.

3. Swap the faulty mouse with a working mouse.

   If the problem is resolved, replace the faulty mouse.

4. If the mouse is a USB mouse, enter the System Setup program and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide.*

5. If the problem is not resolved, see "Getting Help."

Troubleshooting Basic I/O Functions

Problem

l Error message indicates a problem with the serial port.

l Device connected to the serial port is not operating properly.

Action

1. Enter the System Setup program and ensure that the serial port is enabled, and that console redirection is disabled. See "Using the System Setup Program" in your *User's Guide.*

2. If the problem is confined to a particular application, see the application documentation for specific port configuration requirements that the program may require.

3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

   If the tests run successfully but the problem persists, see the appropriate procedure—"Troubleshooting a Serial I/O Device" or "Troubleshooting a Non-USB Parallel Printer."

Troubleshooting a Serial I/O Device

Problem

l Device connected to the serial port is not operating properly.

Action

1. Turn off the system and any peripheral devices connected to the serial port.

2. Swap the serial interface cable with a working cable, and turn on the system and the serial device.

   If the problem is resolved, replace the interface cable.

3. Turn off the system and the serial device, and swap the device with a comparable device.

4. Turn on the system and the serial device.

   If the problem is resolved, replace the serial device.

   If the problem persists, see "Getting Help."

Troubleshooting a USB Device

Problem

- System message indicates a problem with a USB device.
- Device connected to a USB port is not operating properly.

Action

1. Enter the System Setup program, and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide*.

2. Turn off the system and any USB devices.

3. Disconnect the USB devices, and connect the malfunctioning device to another USB connector.

4. Turn on the system and the reconnected device.

   If the problem is resolved, the USB connector might be defective. See "Getting Help."

5. If possible, swap the interface cable with a working cable.

   If the problem is resolved, replace the interface cable.

6. Turn off the system and the USB device, and swap the device with a comparable device.

7. Turn on the system and the USB device.

   If the problem is resolved, replace the USB device.

   If the problem persists, see "Getting Help."

Troubleshooting a Non-USB Parallel Printer

Problem

- Parallel printer is not operating properly.
- Parallel printer interface cable is faulty.

Action

1. Turn off the system and the parallel printer.

2. Swap the parallel printer interface cable with a known working cable, and turn on the system and the printer.

3. Attempt a print operation.

4. If the print operation is successful, replace the interface cable (see "Getting Help").

5. Run the printer's self-test.

6. If the self-test fails, the printer is malfunctioning (see "Getting Help").

Troubleshooting a NIC

Problem

- NIC cannot communicate with network.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Enter the System Setup program and confirm that the NICs are enabled. See "Using the System Setup Program" in your *User's Guide*.

3. Check the appropriate indicator on the NIC connector. See "NIC Indicator Codes" in "Indicators, Messages, and Codes."

   l   If the link indicator does not light, check all cable connections.

   l   If the activity indicator does not light, the network driver files might be damaged or missing.

   Remove and reinstall the drivers if applicable. See the NIC's documentation.

   l   Use another connector on the switch or hub.

   If you are using a NIC card instead of an integrated NIC, see the documentation for the NIC card.

4. Ensure that the appropriate drivers are installed and the protocols are bound. See the NIC's documentation.

5. Ensure that the NICs, hubs, and switches on the network are all set to the same data transmission speed. See the network equipment documentation.

6. Ensure that all network cables are of the proper type and do not exceed the maximum length. See "Network Cable Requirements" in your *User's Guide*.

Responding to a Systems Management Software Alert Message

Systems management software monitors critical system voltages and temperatures, fans, and hard drives in the system. Alert messages appear in the **Alert Log** window. For information about the **Alert Log** window, see the systems management software documentation.


Opening the System

Removing the Bezel

You must remove the bezel to remove the system cover.

1. Using the system key, unlock the bezel. See Figure 5-1.

2. Slide the bezel latch toward the right side of the system.

3. Swing the top of the bezel away from the system, disengage the hooks at the bottom of the bezel, and lift the bezel away from the system.

Figure 5-1. Removing the Bezel
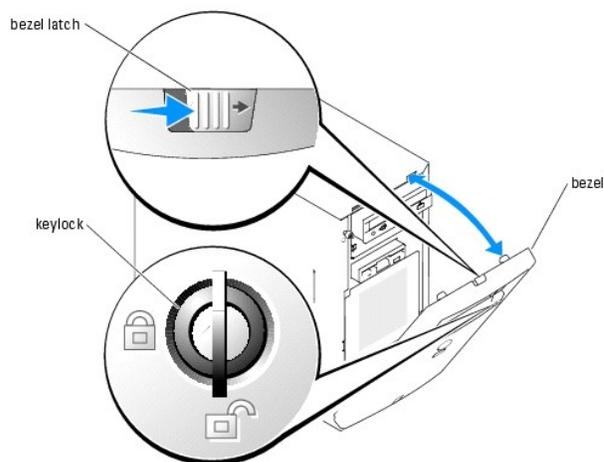
Removing the Cover

To upgrade or troubleshoot the system, remove the system cover to gain access to internal components.

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel."

3. Lay the system on its right side.

4. Loosen the thumbscrew at the front of the system. See Figure 5-2.

5. Slide the cover forward and grasp it at both ends.

6. Lift the front edge of the cover 2.5 cm (1 inch), slide the cover toward the top of the system, and then lift the cover away from the system.

Figure 5-2. Removing the Cover
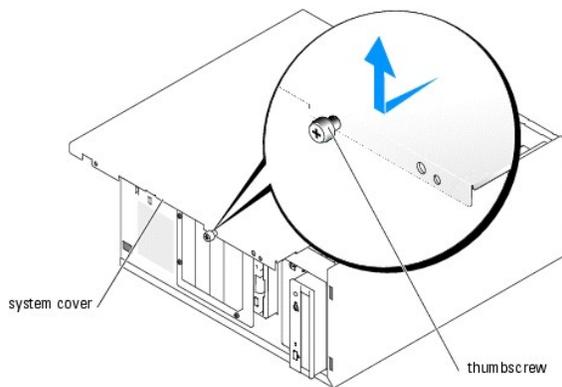
Closing the System

Replacing the Cover

1. Ensure that all cables are connected, and fold cables out of the way.

2. Ensure that no tools or loose parts are left inside the system.

3. Fit the cover on the side of the system, and slide the cover backward.

4. Tighten the cover thumbscrew to secure the cover.

Installing the Bezel

To install the bezel, align the hooks at the bottom of the bezel, swing the top of the bezel toward the system, and press the bezel onto the system until it snaps into place. Using the system key, lock the bezel.

Inside the System

In Figure 5-3, the bezel and system cover are removed to provide an interior view of the system.

Figure 5-3. Inside the System
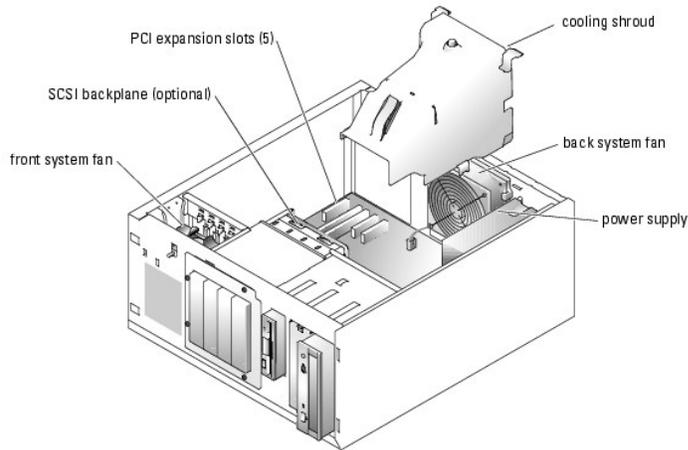
The system board holds the system's control circuitry and other electronic components. The processor and memory are installed directly on the system board. The system can accommodate up to five expansion cards.

The system supports up to four SCSI or SATA hard drives. The peripheral bays support an optional diskette drive and optical drive.

Troubleshooting a Wet System

Problem

- l   Liquid spilled on the system.

- l   Excessive humidity.

Action

⚠️ **CAUTION: See your _Product Information Guide_ for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System."

3. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."

4. Remove all memory modules installed in the system. See "Removing Memory Modules" in "Installing System Components."

5. Remove the processor from the system. See "Removing the Processor" in "Installing System Components."

6. Let the system dry thoroughly for at least 24 hours.

7. Replace the processor, memory modules, and expansion cards. See "Installing a Processor," "Installing Memory Modules," and "Installing an Expansion Card" in "Installing System Components."

8. Close the system. See "Closing the System."

9. Reconnect the system to the electrical outlet, and turn on the system and peripherals.

   If the system does not start properly, see "Getting Help."

10. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

   If the tests fail, see "Getting Help."

Troubleshooting a Damaged System

Problem

- System was dropped or damaged.

Action

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System."

2. Ensure that the following components are properly installed:

   - Expansion cards
   - Memory modules
   - Processor
   - Power supplies
   - Fans
   - Hard drives

3. Ensure that all cables are properly connected.

4. Close the system. See "Closing the System."

5. Run the system board tests in the system diagnostics. See "Running the System Diagnostics."

   If the tests fail, see "Getting Help."

Troubleshooting the System Battery

Problem

- System message indicates a problem with the battery.
- System Setup program loses system configuration information.
- System date and time do not remain current.

📝 **NOTE:** 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 caused by a defective battery.

Action

1. Re-enter the time and date through the System Setup program. See "Using the System Setup Program" in your *User's Guide*.

2. Turn off the system and disconnect it from the electrical outlet for at least one hour.

3. Reconnect the system to the electrical outlet and turn on the system.

4. Enter the System Setup program.

   If the date and time are not correct in the System Setup program, replace the battery. See "System Battery" in "Installing System Components."

   If the problem is not resolved by replacing the battery, see "Getting Help."

📝 **NOTE:** 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.

Troubleshooting a Power Supply

Problem

- l   No power to the system.

- l   Power indicator on the front panel does not light.

Action

1. Run the appropriate online diagnostics test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that the power cables are properly connected to the power connectors on the system board and backplane (if installed). To identify the system board power connectors, see Figure A-3.

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, see "Getting Help."

Troubleshooting System Cooling Problems

Problem

- l   A cooling fan is not operating properly.
- l   System status indicator is amber.
- l   Systems management software issues a fan-related error message.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Run the appropriate diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Open the system. See "Opening the System."

3. Locate the fan referenced by the systems management software or diagnostics.

   See Figure A-3 for the relative location of each fan.

   Ensure that the fan power cables are securely connected to the fan power connectors on the system board. See Figure A-3 for the location of each fan power connector.

4. Check that cables are not blocking the airflow within the system.

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

7. If the problem is not resolved, install a new fan. See "System Fans" in "Installing System Components."

8. If the replacement fan does not operate, see "Getting Help."

Troubleshooting System Memory

Problem

- Faulty memory module.
- Faulty system board.
- System status indicator is amber.
- System beep code indicates a memory problem.
- Systems management software issues a memory-related message through the systems management software.

Action

Memory-related beep code during system startup.

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System."

3. Reseat the memory modules in their sockets. See "Installing Memory Modules" in "Installing System Components."

4. Close the system. See "Closing the System."

5. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If there is no memory-related beep code, the problem is resolved.

6. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

   a. Open the system. See "Opening the System."

   b. Remove all memory modules from the system. See "Removing Memory Modules" in "Installing System Components."

   c. Replace one of the memory modules in socket DIMM1_B.

   d. Close the system. See "Closing the System."

   e. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   f. If there is no memory-related beep code, the memory module is not faulty.

      If the beep code reoccurs, the memory module is faulty and should be replaced.

7. Perform the following steps:

   a. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.

   b. Open the system. See "Opening the System."

   c. Repeat step c through step f in step 6 for each memory module installed.

8. If you have tested all the memory modules and the problem persists, or none of the memory modules passes, the system board is faulty. See "Getting Help."

The system starts up successfully but there are memory-related error messages.

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System."

3. Ensure that the memory modules are populated correctly. See "General Memory Module Installation Guidelines" in "Installing System Components."

   If the memory modules are populated correctly, continue to the next step.

4. Reseat the memory modules in their sockets. See "Installing Memory Modules" in "Installing System Components."

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If there is no memory-related error message, the problem is resolved.

   If the problem persists, see "Getting Help."

There are memory-related error messages in the SEL.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Replace the memory module(s) identified by the diagnostics. See "Installing Memory Modules" in "Installing System Components."

3. Restart the system. If there are still memory-related errors in the SEL, see "Getting Help."

Troubleshooting a Diskette Drive

Problem

⌐ Error message indicates a problem with the optional diskette drive.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Enter the System Setup program and verify that the diskette controller is enabled and the diskette drive is configured correctly. See "Using the System Setup Program" in your *User's Guide.*

2. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

4. Open the system. See "Opening the System."

5. Ensure that the diskette drive interface cable is securely connected to the diskette drive and the system board. To identify the connector on the system board, see Figure A-3.

6. Ensure that a power cable is securely connected to the drive.

7. Close the system. See "Closing the System."

8. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

9. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.

   If the tests fail, continue to the following step.

10. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.

11. Open the system. See "Opening the System."

12. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."

13. Close the system. See "Closing the System."

14. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

15. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.

    If the tests run successfully, an expansion card may be conflicting with the diskette drive logic, or an expansion card may be faulty. Continue to the next step.

    If the tests fail, see "Getting Help."

16. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

17. Open the system. See "Opening the System."

18. Reinstall one of the expansion cards you removed in step 12. See "Installing an Expansion Card" in "Installing System Components."

19. Close the system. See "Closing the System."

20. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

21. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.

22. Repeat step 16 through step 21 until all expansion cards are reinstalled or one of the expansion cards causes the tests to fail.

    If the problem is not resolved, see "Getting Help."

Troubleshooting an Optical Drive

Problem

- System cannot read data from a CD.
- Optical drive indicator does not blink during boot.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Try using a different CD that you know works properly.

2. Enter the System Setup program and ensure that the drive's IDE controller is enabled. See "Using the System Setup Program" in your *User's Guide*.

3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

5. Ensure that the optical drive interface cable is securely connected to the drive and the system board. To identify the connector on the system board, see Figure A-3.

6. Ensure that a power cable is securely connected to the drive.

7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

    If the problem is not resolved, see "Getting Help."

Troubleshooting a SCSI Tape Drive

Problem

- Defective tape drive.
- Defective tape cartridge.

l   Missing or corrupted tape-backup software or tape-drive device driver.

l   Defective SCSI controller card.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Run the System Setup program and ensure that the secondary SCSI channel is enabled and set to SCSI.

    See "Using the System Setup Program" in your *User's Guide*.

2. Remove the tape cartridge you were using when the problem occurred, and replace it with a tape cartridge that you know works.

3. Ensure that the SCSI device drivers for the tape drive are installed and are configured correctly.

4. Reinstall the tape-backup software as instructed in the tape-backup software documentation.

5. Ensure that the tape drive's interface cable is connected to the tape drive and SCSI controller card.

6. Verify that the tape drive is configured for a unique SCSI ID number and that the tape drive is terminated or not terminated, based on the interface cable used to connect the drive.

    See the documentation for the tape drive for instructions on selecting the SCSI ID number and enabling or disabling termination.

7. Run the appropriate online diagnostics tests. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

8. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

9. Open the system. See "Opening the System."

10. Check that the SCSI controller card is firmly seated in its connector. See "Installing an Expansion Card" in "Installing System Components."

11. Close the system. See "Closing the System."

12. Reconnect the system to the electrical outlet, and turn on the system, including attached peripherals.

13. If the problem is not resolved, see the documentation for the tape drive for additional troubleshooting instructions.

14. If you cannot resolve the problem, see "Getting Help" for information on obtaining technical assistance.

Troubleshooting SCSI Hard Drives

Troubleshooting a Hot-Plug or Front-Access (Non-Hot-Plug) SCSI Hard Drive

Problem

l   Device driver error.

l   Hard drive not recognized by the system.

Action

⬤ **NOTICE:** This procedure can destroy data stored on the hard drive. Before you continue, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

    If the test fails, continue to the next step.

2. Run the SCSI controllers test and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

For information about testing the controller, see the controller's documentation.

If the tests fail, continue to the next step.

3. If the SCSI hard drives are configured in a RAID array, restart the system and enter the RAID configuration utility.

   ![NOTE icon] **NOTE:** To enter the utility, press <Ctrl><h>, <Ctrl><a>, or <Ctrl><m>, depending on the utility. See the documentation supplied with the controller for information about the configuration utility.

4. Ensure that the primary SCSI channel is enabled, and restart the system.

5. Verify that the device drivers are installed and configured correctly. See the operating system documentation.

6. Remove the bezel. See "Removing the Bezel."

7. Remove the hard drive:

   ○ *If your hard drive is not configured in a RAID array*, shut down the system, remove the hard drive and install it in another drive bay. See "Front-Access SCSI Hard Drives (Non-Hot-Plug)" in "Installing Drives."

   ○ *If your hard drive is configured in a RAID array with four hard drives*, install a new hard drive. See "Hot-Plug SCSI Hard Drives" in "Installing Drives."

   ○ *If your hard drive is configured in a RAID array with up to three hard drives*, remove the hard drive and install the drive in an empty drive bay. See "Hot-Plug SCSI Hard Drives" in "Installing Drives."

   ![NOTICE icon] **NOTICE:** Do not swap the hard drives in a four hard-drive RAID configuration. Doing so may corrupt the data on both hard drives.

8. Install the bezel. See "Installing the Bezel."

9. If the system recognizes the hard drive, reinstall the hard drive in the original bay. See "Hot- Plug SCSI Hard Drives" or "Front-Access SCSI Hard Drives (Non-Hot-Plug)" in "Installing Drives."

   If the hard drive functions properly in the original bay, the drive carrier could have intermittent problems. Replace the drive carrier. See "Hot-Plug SCSI Hard Drives" or "Front-Access SCSI Hard Drives (Non-Hot-Plug)" in "Installing Drives."

   If the problem persists, the SCSI backplane board has a defective connector. See "Getting Help."

   ![CAUTION icon] **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

10. Check the SCSI cable connections inside the system:

    a. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

    b. Open the system. See "Opening the System."

    c. Lay the system on its right side.

    d. Remove the cover. See "Removing the Cover."

    e. Verify that the SCSI cable is securely connected to the controller card and the SCSI backplane.

    f. Replace the cover. See "Replacing the Cover."

    g. Stand the system upright.

    h. Install the bezel. See "Installing the Bezel."

11. Format and partition the hard drive. See the operating system documentation.

12. If possible, restore the files to the drive.

    If the problem persists, see "Getting Help."

Troubleshooting a Cabled SCSI Hard Drive

Problem

  l Device driver error.

  l Hard drive not recognized by the system.

Action

> **NOTICE:** This procedure can destroy data stored on the hard drive. Before you continue, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

   If the test fails, continue to the next step.

2. Run the SCSI controllers test and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

   For information about testing the controller, see the SCSI or RAID controller card's documentation.

   If the tests fail, continue to the next step.

3. Restart the system and enter the configuration utility.

   > **NOTE:** To enter the utility, press <Ctrl><h>, <Ctrl><a>, or <Ctrl><m>, depending on the utility. See the documentation supplied with the controller for information about the configuration utility.

4. Ensure that the primary SCSI channel is enabled, and restart the system. See the controller card's documentation.

5. Ensure that the required device drivers are installed and configured correctly. See the *Dell OpenManage Server Assistant* CD.

> **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

6. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

7. Open the system. See "Opening the System."

8. Lay the system on its right side.

9. Ensure that the hard-drive interface cable is properly connected between the drive and the controller card. See the controller card's documentation.

10. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

11. Ensure that a power cable is properly connected to the drive.

12. Ensure that the controller card is installed correctly.

13. Ensure that the hard drive is configured with a unique SCSI ID number and that the drive is terminated or not terminated as appropriate. See the documentation for the hard drive.

14. Install the cover. See "Replacing the Cover."

15. Stand the system upright.

16. Install the bezel. See "Installing the Bezel."

17. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

18. Format and partition the hard drive. See the operating system documentation.

19. If possible, restore the files to the drive.

    If the problem persists, see "Getting Help."

Troubleshooting SATA Hard Drives

Troubleshooting a SATA Hard Drive

Problem

- l   Faulty hard drive.

- l   Damaged or improperly connected hard-drive cables.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

⬤ **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

📝 **NOTE:** If the hard drive is used in a RAID configuration, see "Troubleshooting a SATA Hard Drive in a RAID Configuration."

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Enter the System Setup program and verify that the system is configured correctly. See "Using the System Setup Program" in your *User's Guide.*

3. Remove the bezel. See "Removing the Bezel."

4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

5. Open the system. See "Opening the System."

6. Ensure that the hard-drive interface cable is properly connected between the drive and the system board.

    To identify system board connectors, see Figure A-3.

7. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

8. Ensure that the power cable is properly connected to the drive.

9. Install the cover. See "Replacing the Cover."

10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

11. Format and partition the hard drive. See the operating system documentation.

12. If possible, restore the files to the drive.

    If the problem persists, see "Getting Help."

Troubleshooting a SATA Hard Drive in a RAID Configuration

Problem

- l   Device driver error.

- l   Damaged or improperly connected hard-drive cables.

Action

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

⬤ **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Restart your system and enter the RAID configuration utility. See the RAID controller documentation.

3. Ensure that the required device drivers are installed and are configured correctly. See the *Dell OpenManage Server Assistant* CD and the RAID controller's documentation.

4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

5. Open the system. See "Opening the System."

6. Ensure that the hard-drive interface cable is properly connected to the drive and to the controller card. See the documentation that accompanied the controller card.

7. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

8. Ensure that the power cable is properly connected to the drive.

9. Close the system. See "Closing the System."

10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, continue to the next step.

11. Format and partition the hard drive. See the operating system documentation.

12. If possible, restore the files to the drive.

   If the problem persists, see "Getting Help."

Troubleshooting a RAID Controller Card

NOTE: When troubleshooting a RAID controller card, also see the documentation for your operating system and the RAID controller.

Problem

   l   Error message indicates a RAID controller problem.

   l   RAID controller performs incorrectly or not at all.

Action

⚠ **CAUTION: See your _Product Information Guide_ for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that the controller card is firmly seated in its connector. See "Installing an Expansion Card" in "Installing System Components."

5. Ensure that the appropriate cables are firmly connected to their corresponding connectors on the controller card and SCSI backplane.

6. Close the system. See "Closing the System."

7. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, see the RAID controller's documentation for more information on troubleshooting.

Troubleshooting Expansion Cards

NOTE: When troubleshooting an expansion card, see the documentation for your operating system and the expansion card.

Problem

   l   Error message indicates a problem with an expansion card.

   l   Expansion card performs incorrectly or not at all.

Action

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that each expansion card is firmly seated in its connector. See "Installing an Expansion Card" in "Installing System Components."

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, go to the next step.

7. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

8. Open the system. See "Opening the System."

9. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."

10. Close the system. See "Closing the System."

11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

12. Run the appropriate online diagnostic test.

    If the tests fail, see "Getting Help."

13. For each expansion card you removed in step 9, perform the following steps:

    a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

    b. Open the system. See "Opening the System."

    c. Reinstall one of the expansion cards. See "Installing an Expansion Card."

    d. Close the system. See "Closing the System."

    e. Run the appropriate diagnostic test.

       If the tests fail, see "Getting Help."

Troubleshooting the Microprocessor

Problem

ι Error message indicates a processor problem.

Action

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostics test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that the processor and heat sink are properly installed. See "Processor" in "Installing System Components."

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

7. Run the appropriate online diagnostic test.

   If the tests fail or the problem persists, continue to the next step.

8. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

9. Open the system. See "Opening the System."

10. Replace the processor with another processor of the same capacity. See "Processor" in "Installing System Components."

11. Close the system. See "Closing the System."

12. Run the appropriate online diagnostic test.

    If the tests complete successfully, replace the processor. See "Getting Help."

    If the problem persists, see "Getting Help."

Installing System Components

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Cooling Shroud
- System Fans
- Power Supply
- Expansion Cards
- System Memory
- Processor
- Installing a RAC Card
- System Battery

This section describes how to install the following system components:

- Cooling shroud
- System fans
- Power supply
- Memory modules
- Processor
- Expansion cards
- System battery

Cooling Shroud

Removing the Cooling Shroud

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Disconnect the power cables and hard-drive interface cable connectors from the SCSI backplane (if applicable) or hard drives.

6. Press the shroud release tab on the back panel toward the power supply. See Figure 6-1.

7. Lift the cooling shroud out of the system. See Figure 6-1.

Figure 6-1. Removing the Cooling Shroud

shroud release tab

anchor tabs (2)
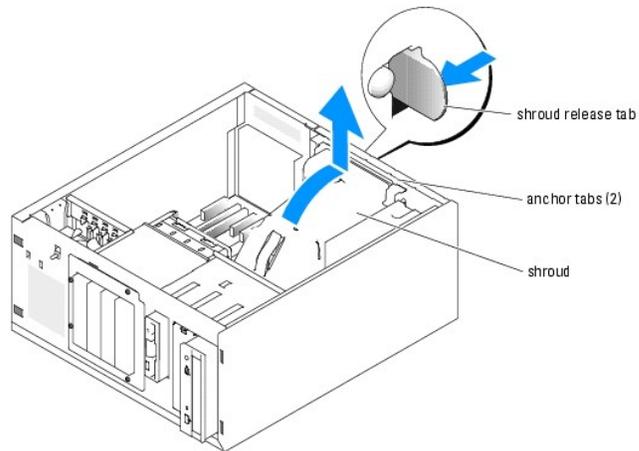
shroud

Installing the Cooling Shroud

1. Ensure that no tools or loose parts are left inside the system.

2. Align the anchor tabs on the cooling shroud with the notches in the system chassis.

3. Reposition the SCSI cable and power cables so they do not obstruct the memory modules and interfere with installing the cooling shroud.

4. Gently lower the cooling shroud until the shroud release tab on the back panel snaps into place.

5. Reconnect the power cable(s) to the SCSI backplane (if applicable) or the hard drive(s).

System Fans

The system includes the following cooling fans:

- l   Front system fan
- l   Back system fan

Removing the Front System Fan

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

Figure 6-2 illustrates the front system fan inside the system and the fan cable routing hole in the expansion-card guide bracket.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Disconnect the fan power cable from the FRONT_FAN connector on the system board. See Figure 6-2.

Figure 6-2. Front System Fan Power Cable

fan power cable

expansion-card guide bracket
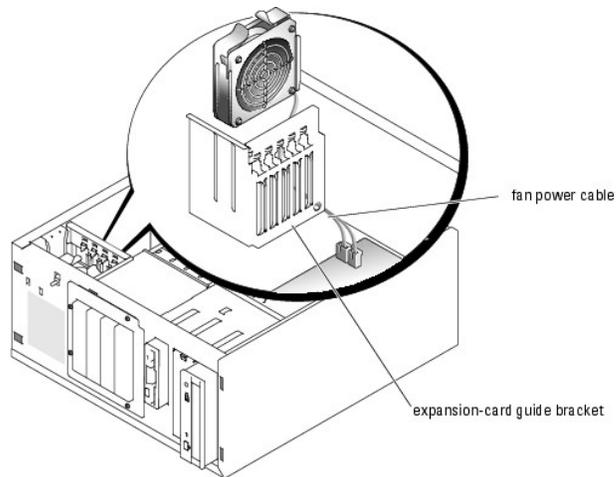
6. Compress the two release tabs on the top of the fan assembly and lift the fan assembly away from the system. See Figure 6-3.

Figure 6-3. Removing and Replacing the Front System Fan

release tabs (2)
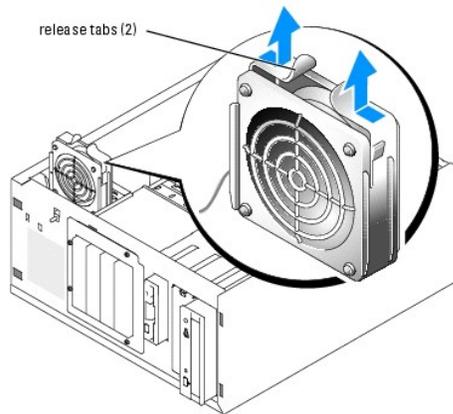
Installing the Front System Fan

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Insert the fan power cable through the routing hole in the expansion-card guide bracket. See Figure 6-2.

2. Align the fan assembly with the slots in the chassis and lower the assembly into the chassis. See Figure 6-3.

3. Pull the fan cable through the routing hole in the expansion-card guide bracket. See Figure 6-2.

4. Connect the fan cable connector to the FRONT_FAN connector on the system board.

5. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

6. Stand the system upright.

7. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

8. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Removing the Back System Fan

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud."

6. Disconnect the fan cable from the BACK_FAN connector on the system board. To identify system board connectors, see Figure A-3.

7. Pull the release tab on the fan assembly away from the back panel and slide the fan assembly about 0.63 cm (0.25 inch) toward the expansion-card slots. See Figure 6-4.

8. Pull the fan assembly forward and lift the assembly out of the system. See Figure 6-4.

Figure 6-4. Removing the Back System Fan
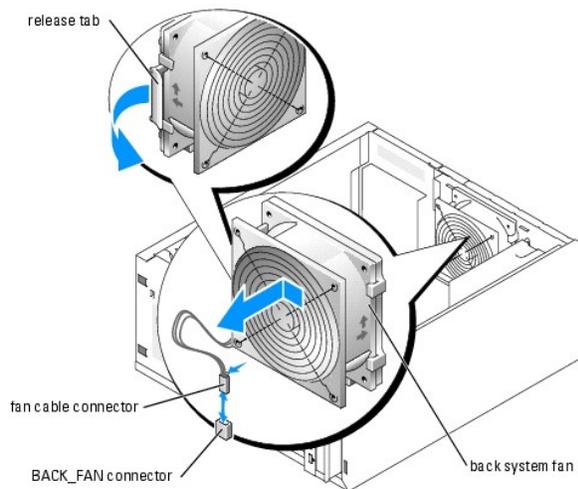
Installing the Back System Fan

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Align the tabs on the fan bracket with the mounting holes in the back panel and slide the fan assembly toward the power supply about 0.6 cm (0.25 inch) until the fan bracket release tab snaps into place. See Figure 6-4.

2. Connect the fan cable to the BACK_FAN connector on the system board.

   To identify system board connectors, see Figure A-3.

3. Install the cooling shroud. See "Installing the Cooling Shroud."

4. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

5. Stand the system upright.

6. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

7. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Power Supply

Removing the Power Supply

⚠️ **CAUTION: See the *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Disconnect the DC power cables from the following components:

   - POWER CONN connector on the backplane board (if applicable)
   - PWR CONN and 12V connectors on the system board
   - Hard drives or SCSI backplane board
   - Diskette drive (if applicable)
   - Optical drive (if applicable)
   - Tape backup drive (if applicable)

6. Remove the cooling shroud. See "Removing the Cooling Shroud."

7. Remove the four screws securing the power supply to the back panel. See Figure 6-5.

Figure 6-5. Removing the Power Supply
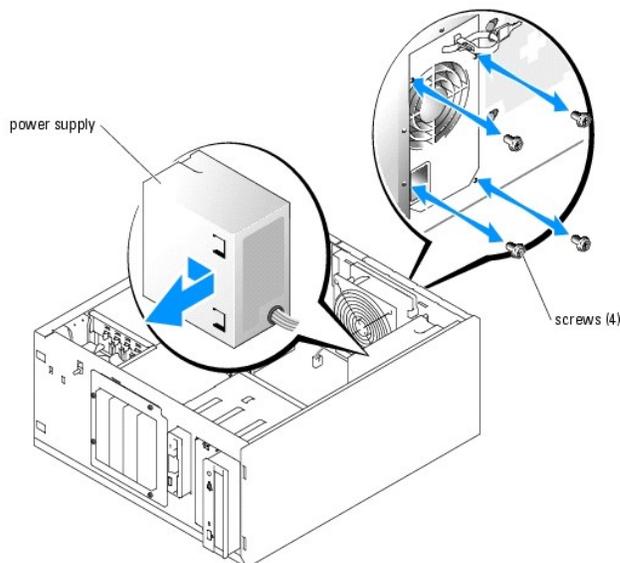
8. Slide the power supply toward the front of the system, and then lift the power supply up and out of the system.

Replacing the Power Supply

1. Lower the power supply into the system and align the mounting holes with the holes on the back panel.

2. Install the four screws securing the power supply to the back panel.

3. Install the cooling shroud. See "Installing the Cooling Shroud."

4. Connect the DC power cables to the following components:
   - POWER CONN connector on the backplane board (if applicable)
   - PWR CONN and 12V connectors on the system board
   - Hard drives or SCSI backplane.
   - Diskette drive (if applicable)
   - Optical drive (if applicable)
   - Tape backup drive (if applicable)

5. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

6. Stand the system upright.

7. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

8. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Expansion Cards

Your system supports up to five full-length expansion cards, installed in connectors on a riser card. The expansion slots are configured as follows:

- Slots 1 and 2 are x1 lane-width PCI-Express expansion slots.
- Slots 3 and 4 are 3.3-V, 64-bit, 100-MHz PCI-X expansion slots. 133-MHz cards installed in these slots will run at 100 MHz.
- Slot 5 is a 5-V, 32-bit, 33-MHz legacy PCI expansion slot.

Figure 6-6 shows the relative locations of the expansion-card slots.

⊘ **NOTICE:** If you install a RAC card, it must be installed in PCI slot SLOT_5.

Figure 6-6. Expansion Slots
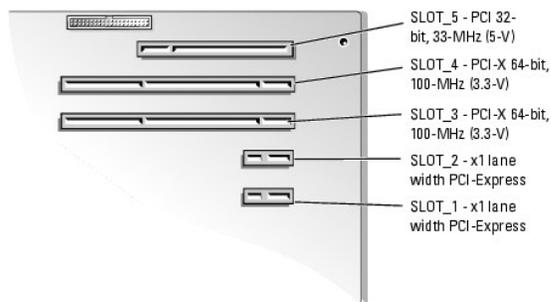
Installing an Expansion Card

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Unpack the expansion card, and prepare it for installation.

   For instructions, see the documentation that accompanied the card.

2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

3. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

4. Lay the system on its right side.

5. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

6. Remove the filler bracket from the expansion slot.

7. Install the expansion card. See Figure 6-7.

    a. Position the expansion card so that the card-edge connector aligns with the expansion- card connector on the system board.

    b. Insert the card-edge connector firmly into the expansion-card connector until the card is fully seated.

    c. Install the screw that secures the expansion-card bracket to the back panel.

8. Connect any cables that should be attached to the card.

    See the documentation that accompanied the card for information about its cable connections.

9. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

10. Stand the system upright.

11. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

12. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

13. Install any device drivers required for the card as described in the documentation for the card.

Figure 6-7. Removing and Installing an Expansion Card
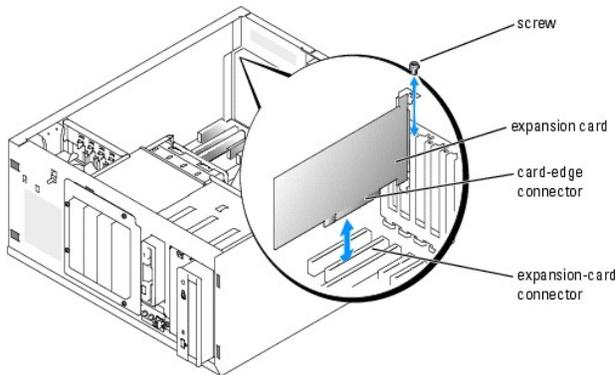
Removing an Expansion Card

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Disconnect any cables attached to the card.

6. Remove the expansion card (see Figure 6-7):

    a. Remove the screw that secures the expansion-card bracket to the back panel.

    b. Grasp the expansion card by its top corners, and carefully remove it from the expansion- card connector.

🚫 **NOTICE:** You must install a filler bracket over an empty expansion slot to maintain Federal Communications Commission (FCC) certification of the system. The brackets also help keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

7. If you are removing the card permanently, install a metal filler bracket over the empty expansion slot opening and close the expansion-card latch.

8. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

9. Stand the system upright.

10. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

11. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

System Memory

You can upgrade your system memory to a maximum of 4 GB by installing combinations of 256-MB, 512-MB, or 1-GB 2-way unbuffered ECC DDR 2 400/533 memory modules. The system memory is located on the system board adjacent to the power supply bays. See Figure A-3. The memory module sockets are arranged in two banks on two channels (A and B). The memory module banks are identified as follows:

- l Bank 1: DIMM1_A and DIMM1_B
- l Bank 2: DIMM2_A and DIMM2_B

General Memory Module Installation Guidelines

- l If only one memory module is installed, it must be installed in socket DIMM1_A.
- l If two or more memory modules are installed, they must be installed in pairs of matched memory size, speed, and technology.

Table 6-1 shows examples of different memory configurations.

Table 6-1. Sample Memory Configurations

Total Memory	DIMM1_A	DIMM2_A	DIMM1_B	DIMM2_B	Memory Mode
256 MB	256 MB	none	none	none	Single channel
512 MB	256 MB	none	256 MB	none	Dual channel, interleaved
512 MB	512 MB	none	none	none	Single channel
1 GB	256 MB	256 MB	256 MB	256 MB	Dual channel, interleaved
1 GB	512 MB	none	512 MB	none	Dual channel, interleaved
1 GB	1 GB	none	none	none	Single channel
1.5 GB	512 MB	256 MB	512 MB	256 MB	Dual channel, interleaved
2 GB	512 MB	512 MB	512 MB	512 MB	Dual channel, interleaved
2 GB	1 GB	none	1 GB	none	Dual channel, interleaved
3 GB	1 GB	512 MB	1 GB	512 MB	Dual channel, interleaved
4 GB	1 GB	1 GB	1 GB	1 GB	Dual channel, interleaved

Installing Memory Modules

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud."

6. Locate the memory module sockets. See Figure A-3.

7. Press the ejectors on the memory module socket down and out, as shown in Figure 6-8, to allow the memory module to be inserted into the socket.

Figure 6-8. Installing and Removing a Memory Module

memory module

memory module socket ejectors (2)

socket
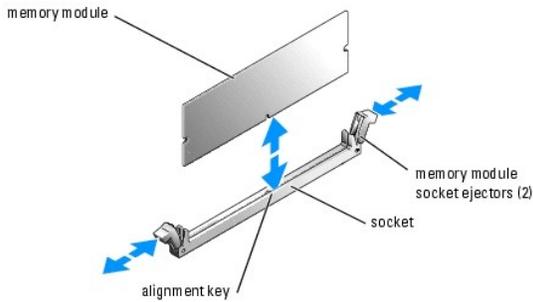
alignment key

8. Align the memory module's edge connector with the alignment key on the memory module socket, and insert the memory module in the socket.

    NOTE: The memory module socket has an alignment key that allows you to install the memory module in the socket in only one way.

9. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the memory module into the socket.

    When the memory module is properly seated in the socket, the ejectors on the memory module socket align with the ejectors on the other sockets that have memory modules installed.

10. Repeat step 6 through step 9 of this procedure to install the remaining memory modules. See Table 6-1 for sample memory configurations.

11. Install the cooling shroud. See "Installing the Cooling Shroud."

12. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

13. Stand the system upright.

14. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

15. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

16. (Optional) Press <F2> to enter the System Setup program, and check the **System Memory** setting on the main **System Setup** screen.

    The system should have already changed the value to reflect the newly installed memory.

17. If the value is incorrect, one or more of the memory modules may not be installed properly. Repeat step 1 through step 16 of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.

18. Run the system memory test in the system diagnostics. See "Running the System Diagnostics."

Removing Memory Modules

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud."

6. Locate the memory module sockets. See Figure A-3.

7. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket. See Figure 6-8.

8. Install the cooling shroud. See "Installing the Cooling Shroud."

9. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

10. Stand the system upright.

11. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

Processor

You can upgrade the system processor to take advantage of future options in speed and functionality.

The following items are included in the processor upgrade kit:

- Processor
- Heat sink

Removing the Processor

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud."

⊘ **NOTICE:** Never remove the heat sink from a processor unless you intend to remove the processor. The heat sink is necessary to maintain proper thermal conditions.

6. Remove the heat sink. See Figure 6-9.

   a. Open one securing clip by pressing the end of the clip down and away from the retention until it clears the securing tab on the retention module, and then lift the clip up.

   b. Repeat step a for the remaining securing clip.

   c. Rotate the heat sink slightly and then lift the heat sink off the processor. Do not pry the processor off the heat sink.

Figure 6-9. Removing the Heat Sink
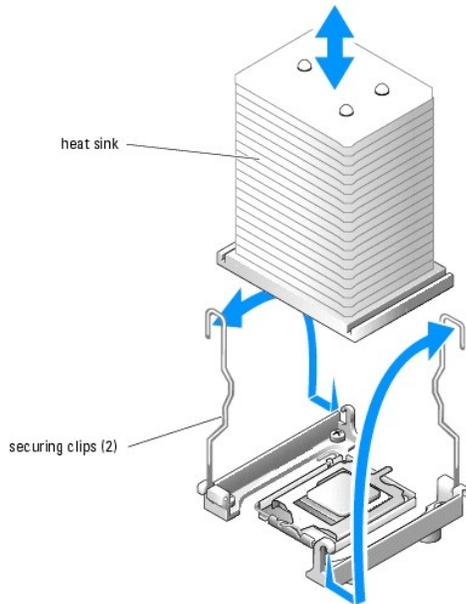
7. Press down on the processor socket release lever, then pull the release lever upward to the fully open position. See Figure 6-10.

8. Open the processor cover. See Figure 6-10.

9. Lift the processor vertically out of the socket. Leave the processor cover and release lever in the open position so that the socket is ready for the new processor. See Figure 6-10.

Figure 6-10. Replacing the Processor
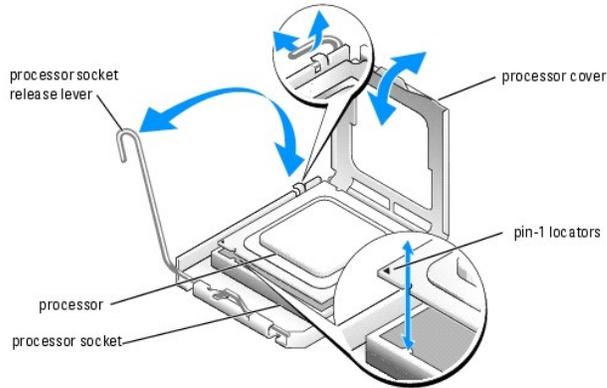
Installing a Processor

⚠️ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Unpack the new processor and heat sink.

2. Ensure that the processor socket release lever is in the fully open position.

3. Align the pin 1 corners of the processor and socket. See Figure 6-10.

⊘ **NOTICE:** You must position the processor correctly in the socket to avoid damaging the processor and the system board when you turn on the system. Be careful not to touch or bend the pins on the socket.

4. Set the processor lightly in the socket and ensure that the processor is level in the socket. When the processor is positioned correctly, press it gently to seat it in the socket.

5. Close the processor cover.

6. Rotate the release lever back down until it snaps into place, securing the processor cover.

⊖ **NOTICE:** Do not operate the system without the heat sink installed. The heat sink is required to maintain proper thermal conditions.

7. Remove the thermal grease protective cover from the new heat sink.

   If you did not receive a new heat sink with the processor, see "Getting Help."

8. Lower the heat sink onto the processor. See Figure 6-9.

9. Secure the heat sink to the retention module.

   a. Gently press down on the heat sink and then press one securing clip to secure it.

   b. Repeat step a for the remaining securing clip.

10. Ensure that the back fan connector is connected to the BACK_FAN connector on the system board. See Figure A-3.

11. Install the cooling shroud. See "Installing the Cooling Shroud."

12. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

13. Stand the system upright.

14. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

15. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

16. Enter the System Setup program, and ensure that the processor options match the new system configuration. See "Using the System Setup Program" in your *User's Guide.*

   As the system boots, it detects the presence of the new processor and automatically changes the system configuration information in the System Setup program. A message similar to the following appears:

   `One 2.3 GHz Processor, Processor Bus: 533 MHz, L2 cache 256 KB Advanced`

17. Confirm that the top line of the system data area in the System Setup program correctly identifies the installed processor. See "Using the System Setup Program" in your *User's Guide.*

18. Exit the System Setup program.

19. Ensure that your system is running the latest BIOS version.

   You can download the latest BIOS version from the Dell Support website located at **support.dell.com**

20. Run the system diagnostics to verify that the new processor is operating correctly.

   See "Running the System Diagnostics" for information on running the diagnostics and troubleshooting any problems that may occur.

Installing a RAC Card

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Install the RAC card in PCI expansion slot SLOT_5.

See "Installing an Expansion Card" for information on installing the card.

6. Connect the cable from the RAC card to connector RAC_CONN on the system board. See Figure A-3.

7. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

8. Stand the system upright.

9. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

10. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

11. Enter the System Setup program and verify that the setting for the RAC card has changed to reflect the presence of the card. See "Using the System Setup Program" in your *User's Guide*.

See the RAC card documentation for information on configuring and using the RAC card.

System Battery

Replacing the System Battery

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Enter the System Setup program and record the option settings on the System Setup screens.

   See "Using the System Setup Program" in the *User's Guide*.

2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

3. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

4. Lay the system on its right side.

5. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

6. Remove the system battery. See Figure A-3 for the battery socket location on the system board.

   a. Pull the latch away from the battery. See Figure 6-11

   b. Lift the battery out of the battery socket.

Figure 6-11. Removing the System Battery
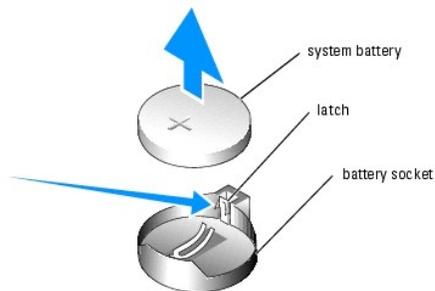
⊖ **NOTICE:** You must install the new system battery with the side labeled "+" facing up. See Figure 6-11.

7. To install the new system battery, hold the battery with the side labeled "+" facing up, and then press the battery straight down into the battery socket until the latch snaps into place over the edge of the battery. See Figure 6-11.

8. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

9. Stand the system upright.

10. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

11. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

12. Enter the System Setup program to confirm that the battery operates properly.

13. From the main screen, select **System Time** to enter the correct time and date.

14. Re-enter any system configuration information that is no longer displayed on the System Setup screens, and then exit the System Setup program.

15. To test the newly installed battery, see "Troubleshooting the System Battery" in "Troubleshooting Your System."

Installing Drives
Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- ● Connecting Drives
- ● Front-Panel Drive Inserts
- ● Diskette Drive
- ● 5.25-Inch Drives
- ● Hard Drives
- ● Cabled SATA and SCSI Hard Drives
- ● Front-Access SCSI Hard Drives (Non-Hot-Plug)
- ● Hot-Plug SCSI Hard Drives
- ● Installing the Optional SCSI Backplane Board
- ● Installing a RAID Controller Card

Your system supports the following drives:

- l Up to two externally accessible 5.25-inch drives (typically optical and tape backup drives). An optical drive is standard in the first external drive bay, and a tape backup device can be installed in the second external drive bay.

- l An externally accessible 3.5-inch diskette drive.

- l Up to four 1-inch SATA or SCSI hard drives. Four hard drive configurations are available:

  - o Cabled SATA drives. See "Cabled SATA and SCSI Hard Drives."

  - o Cabled SCSI drives (requires optional SCSI controller card). See "Cabled SATA and SCSI Hard Drives."

  - o Front-access (non-hot-plug) SCSI drives (requires optional SCSI backplane and optional SCSI controller card). See "Front-Access SCSI Hard Drives (Non-Hot-Plug)" and "Installing the Optional SCSI Backplane Board."

  - o Hot-plug SCSI drives (requires optional SCSI backplane and optional SCSI RAID controller). See "Hot-Plug SCSI Hard Drives," "Installing a RAID Controller Card," and "Installing the Optional SCSI Backplane Board."-+

Connecting Drives

Interface Cables

Most interface connectors are keyed for correct insertion. Keying ensures that the pin-1 wire in the cable connects to pin 1 in the connectors on both ends. When you disconnect an interface cable, take care to grasp the cable connector, rather than the cable itself, to avoid stress on the cable.

Drive Cable Configurations

Your system can accommodate many different drive configurations, each with specific cable requirements. Table 7-1 shows the cable requirements for common drive configurations.

NOTE: Installing SATA and SCSI hard drives in the same system is not supported.

Table 7-1. Drive Cable Configuration

Drives	Required Cable	Cable Connections
IDE optical drives, and IDE and SCSI tape drives (See Figure 7-4.)	40-pin IDE 2-drop cable or SCSI 1-drop cable (terminated)	IDE drive and primary IDE connector on system board or the SCSI tape device and the SCSI controller card
Up to four cabled SATA hard drives (See Figure 7-7.)	7-pin SATA hard-drive cable (one cable per drive)	SATA hard drives and SATA port connectors on the system board, or on a RAID controller card.
Up to four cabled (non-hot-plug) SCSI hard-drives (See Figure 7-9.)	94-cm (37-inch) SCSI 4-drop cable (terminated)	SCSI hard drives and SCSI RAID controller or SCSI controller card
Up to four front-access or hot-plug SCSI hard drives connected to the SCSI backplane (See Figure 7-12.)	38-cm (15-inch) 68-pin SCSI 1-drop cable (unterminated)	SCSI backplane and the SCSI controller card

DC Power Cables

Each drive must connect to a DC power cable from the system power supply. These power cables are used for the 3.5-inch diskette drive, 5.25-inch devices, and hard drives.

NOTICE: To avoid electrical damage to internal system components, install a cover connector on any unused connectors on hard-drive power cables.

Front-Panel Drive Inserts

To help keep dust and dirt out of the system, a plastic insert in the bezel covers each empty external drive bay. Additionally, each empty external drive bay is covered by a metal insert in the chassis to maintain Federal Communications Commission (FCC) certification of the system.

Before you install a 5.25-inch drive in an empty external drive bay, you must first remove both front-panel drive inserts. If you remove a 5.25-inch drive permanently, you must install both inserts.

Removing the Front-Panel Drive Inserts

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Remove the bezel drive insert (see Figure 7-1):

    a. From inside the bezel, press the center of the insert outward with your thumbs to loosen the tabs on the sides of the insert.

    b. Pull the insert out of the bezel.

4. Remove the chassis drive insert (see Figure 7-1):

    a. Press both sides of the insert to loosen the tabs on the insert.

    b. Pull the insert out of the chassis.

Figure 7-1. Removing the Front-Panel Drive Inserts
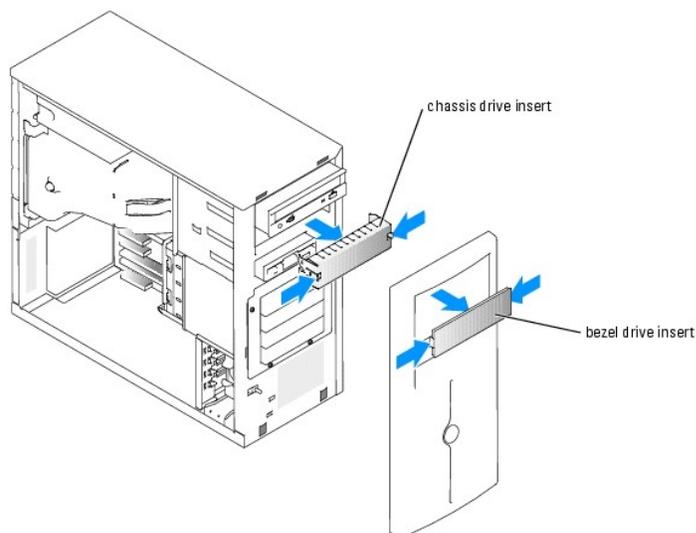
Installing the Front-Panel Drive Inserts

⚠ **CAUTION: See your *System Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

⊖ **NOTICE:** You must install both inserts in an empty 5.25-inch drive bay to maintain Federal Communications Commission (FCC) certification of the system. The inserts also help keep dust and dirt out of the system.

1. Install the chassis drive insert by sliding the insert into the chassis until tabs on the side of the insert snap into place. See Figure 7-1.

2. Install the bezel drive insert by sliding the insert into the bezel until the tabs on the side of the insert snap into place. See Figure 7-1.

3. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

4. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Diskette Drive

Removing a Diskette Drive

⚠️ **CAUTION: See your** *Product Information Guide* **for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Disconnect the power cable and the interface cable from the diskette drive. See Figure 7-2.

6. Remove the two screws that secure the diskette drive in the externally accessible drive bay. See Figure 7-2.

7. Slide the diskette drive forward out of the drive bay.

Installing a Diskette Drive

⚠️ **CAUTION: See your** *Product Information Guide* **for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Unpack the drive and prepare the drive for installation.

   For instructions, see the documentation that accompanied the drive.

2. Slide the diskette drive into the externally accessible drive bay.

3. Install the two screws that secure the diskette drive in the drive bay. See Figure 7-2.

4. Connect the power cable and the interface cable to the diskette drive. See Figure 7-2.

5. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

6. Stand the system upright.

7. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

8. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

Figure 7-2. Removing or Installing a Diskette Drive

screws (2)

externally accessible drive bay

diskette (3.5-inch) drive

interface cable

power cable
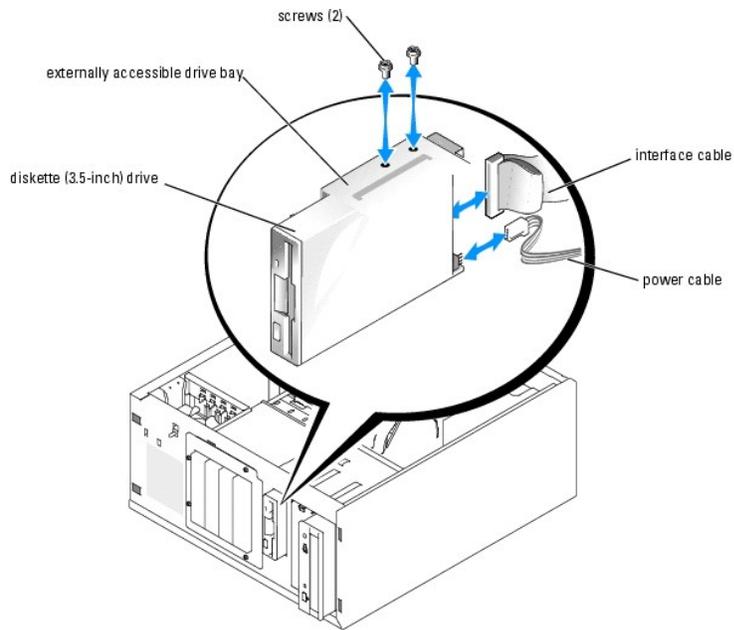
5.25-Inch Drives

An optical drive is standard in the first external drive bay. An additional IDE or SCSI tape backup device can be installed in the second external drive bay. These drives connect either to the system board or to an optional controller card.

NOTE: Installing an additional optical drive in the second external drive bay is not supported.

Installing a 5.25-Inch Drive

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Unpack the drive (and controller card, if applicable), and prepare the drive for installation.

   For instructions, see the documentation that accompanied the drive.

   NOTE: If you are installing a SCSI tape drive, you must install an Ultra 3 SCSI controller card. The optional SCSI RAID controller card does not support a SCSI tape drive.

2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

3. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

4. Lay the system on its right side.

5. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

6. Remove the cooling shroud. See "Removing the Cooling Shroud" in "Installing System Components."

7. Remove the front-panel inserts for the empty external drive bay. See "Removing the Front- Panel Drive Inserts."

8. Slide the drive into the external drive bay.

9. Install the screws that secure the drive in the drive bay. See Figure 7-3.

Figure 7-3. Installing or Removing a 5.25-Inch Drive
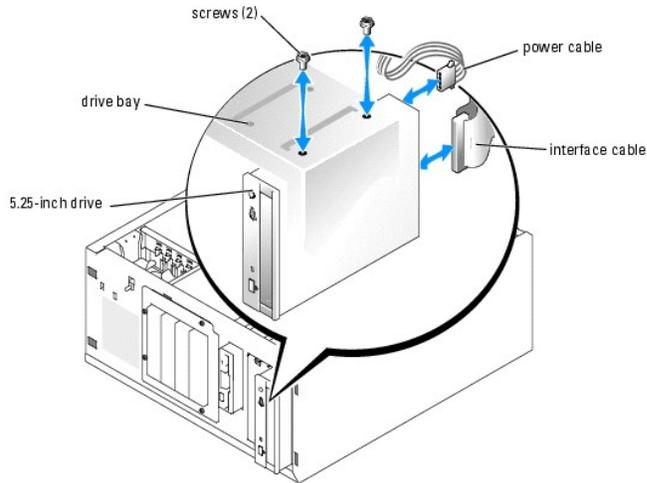
10. If a controller card was supplied with the drive, install the controller card in expansion slot 3, 4, or 5. See "Installing an Expansion Card" in "Installing System Components."

11. Connect a power cable to the drive. See Figure 7-3.

12. Connect the interface cable to the drive and to the appropriate connector on the system board or controller card (if applicable).

    ✏ **NOTE:** See the documentation that is included with the controller card for more information.

    If you are installing an IDE device (such as an optical drive), connect the interface cable to the IDE device and the IDE connector on the system board. See Figure 7-4.

    If you are installing a SCSI device in the second drive bay (such as a tape backup device), connect the interface cable to the device and to channel A on the SCSI controller card. See Figure 7-4.

    See Figure A-3 to locate the system board connectors.

    ✏ **NOTE:** A SCSI device attached to a SCSI controller card and an IDE device attached to the system board can be installed together as shown in Figure 7-4.

Figure 7-4. Connecting a Tape Drive to a SCSI Controller Card
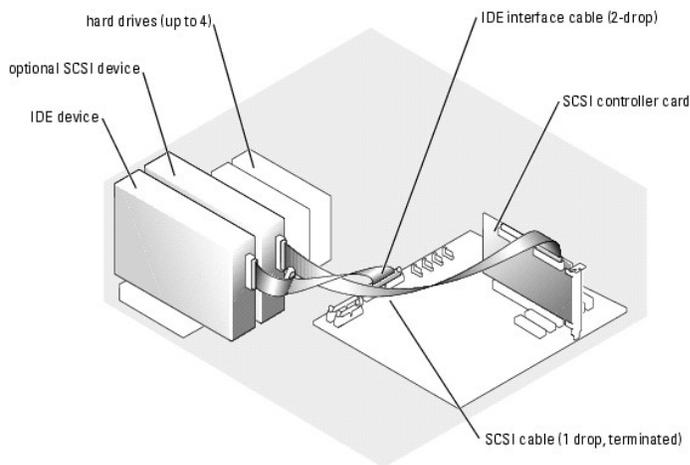
13. Ensure that all cables are firmly connected and arranged so that they will not catch on the computer cover or block airflow inside the system.

14. Install the cooling shroud. See "Installing the Cooling Shroud" in "Installing System Components."

15. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

16. Stand the system upright.

17. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

18. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

19. Test the drive.

    If you installed an IDE device, run the IDE devices tests in the system diagnostics to determine whether the device operates properly. See "Running the System Diagnostics."

    If you installed a SCSI device, run the SCSI controllers test in the system diagnostics. See "Running the System Diagnostics."

    If you installed a tape drive, see the tape drive software documentation to perform a backup and verification test.

Hard Drives

Your system can contain up to four 1-inch SATA or SCSI hard drives in a optional removable hard-drive bay (see Figure 7-5). These drives connect either to the system board or to an optional controller card.

General Installation Guidelines

Use the following guidelines when installing hard drives:

- You should only use drives that have been tested and approved by the system manufacturer.

- Do not install a mixture of SATA and SCSI hard drives. All hard drives must either be SCSI drives or SATA drives.

- You may need to use different programs than those provided with the operating system to partition and format a hard drive. See the hard drive's documentation for information on setting up the drive.

- When you format a high-capacity hard drive, allow enough time for the formatting to be completed. Long format times for these drives are normal. For example, a large drive can take over an hour to format.

- Do not turn off or reboot your system while the drive is being formatted. Doing so can cause a drive failure.

NOTE: The hard-drive activity indicator operates only when SATA hard drives are connected directly to the SATA port connectors on the system board. The indicator does not operate with SCSI drives or SATA drives that are attached to a RAID controller card. To identify the indicator, see Figure 2-1.

Configuring the Boot Drive

The drive or device from which the system boots is determined by the boot order specified in the System Setup program (see "Using the System Setup Program" in your *User's Guide*). To boot the system from a hard drive or drive array, the drive(s) must be connected to the appropriate controller:

- To boot from a single SATA hard drive, the master drive (drive 0) must be connected to the SATA_0 connector on the system board. To identify system board connectors, see Figure A-3.

- To boot from a single SCSI hard drive, the drive must be connected to a SCSI controller card. See the documentation that accompanied the controller card.

Cabled SATA and SCSI Hard Drives

Removing a Cabled Hard Drive

⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud" in "Installing System Components."

6. Disconnect the interface and power cables to the hard drives in the drive bay.

7. Remove the hard-drive bay. See Figure 7-5 and Figure 7-6.

   a. Loosen the four screws that secure the drive bay to the system.

   b. Slide the hard-drive bay out of the system.

8. Remove the drive from the drive bay. See Figure 7-5 and Figure 7-6.

   a. Remove the screws that secure the drive in the hard-drive bay.

   b. Slide the drive out of the drive bay.

Figure 7-5. Installing or Removing a SATA Hard Drive
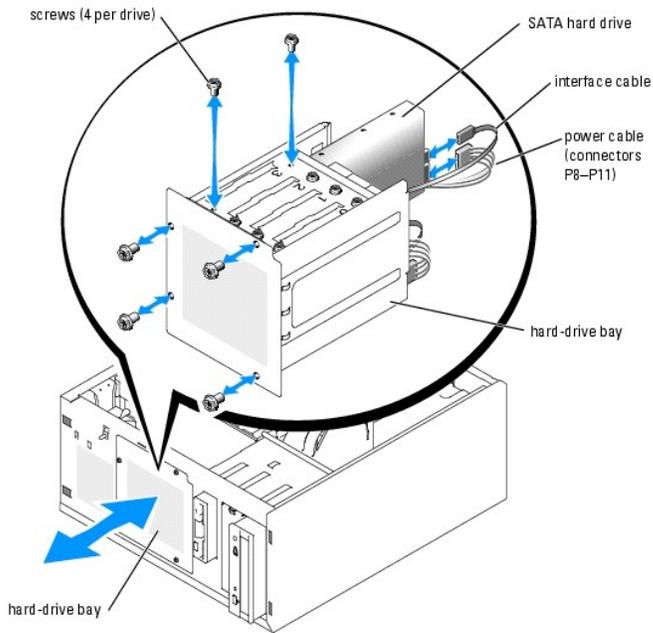
Figure 7-6. Installing or Removing a Cabled SCSI Hard Drive
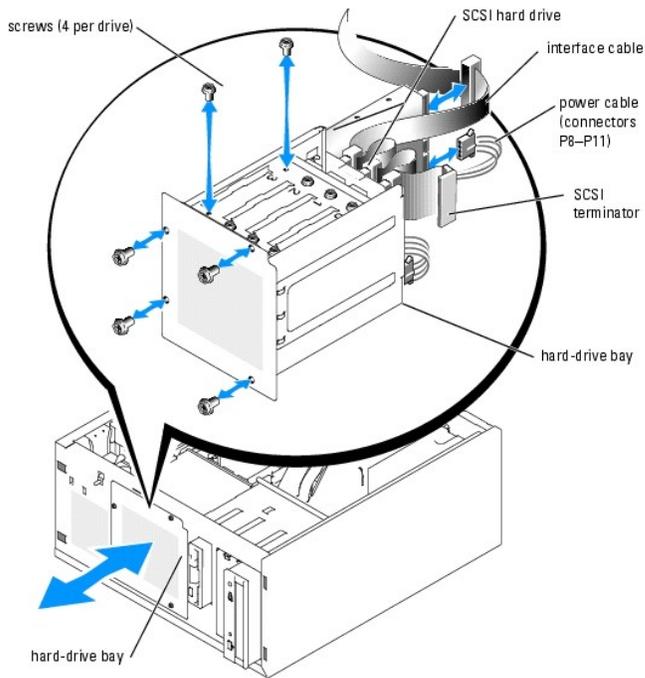
Installing a Cabled Hard Drive

1. Unpack the drive (and controller card, if applicable), and prepare the drive for installation.

    For instructions, see the documentation that accompanied the drive.

2. Install the hard drive in the hard-drive bay:

    a. Slide the drive into the drive bay with the back of the drive toward the back of the drive bay.

    b. Install the screws that secure the drive in the drive bay.

3. Install the hard-drive bay (see Figure 7-5 and Figure 7-6):

    a. Slide the drive bay into the system until the drive bay contacts the system.

    b. Install the four screws that secure the drive bay in the system.

⊘ **NOTICE:** To prevent damage to internal system components, ensure that a connector cap is installed on each available power connector that is not connected to a hard drive.

4. Connect a power cable to each hard drive. See Figure 7-5 and Figure 7-6.

5. Connect the hard-drive interface cables to each hard drive.

    ○ *If you are installing a SATA hard drive,* connect the SATA interface cable to the hard drives and to the SATA ports on the system board (see Figure 7-7) or SATA RAID controller board (when available) (see Figure 7-8).

    ○ *If you are installing a cabled SCSI drive,* connect the SCSI interface cable to the hard drives and to the SCSI controller card. See Figure 7-9.

Figure 7-7. Connecting SATA Hard Drives to the Integrated Drive Controller
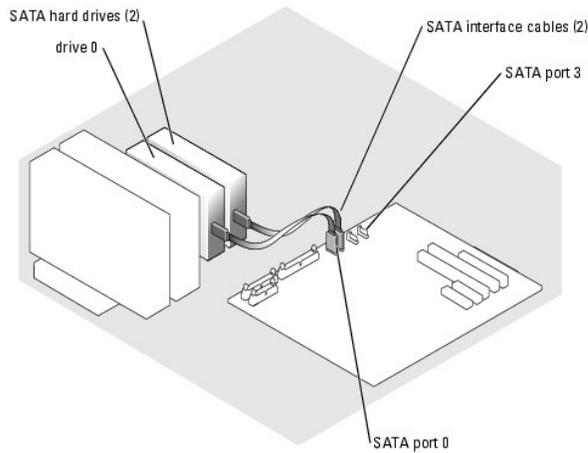
Figure 7-8. Connecting SATA Drives to a SATA RAID Controller Card
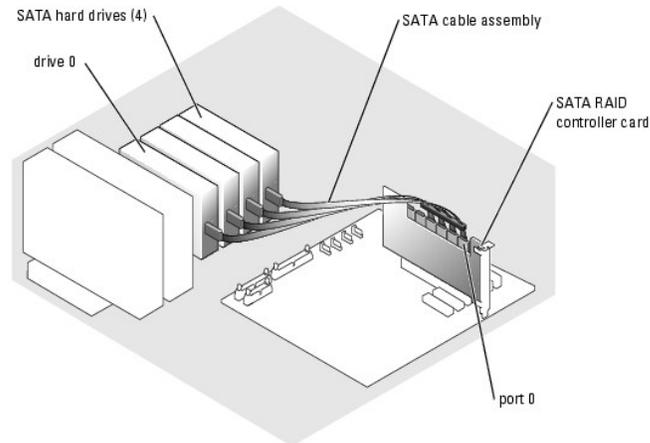
Figure 7-9. Cabling Four SCSI Hard Drives to the SCSI Controller Card
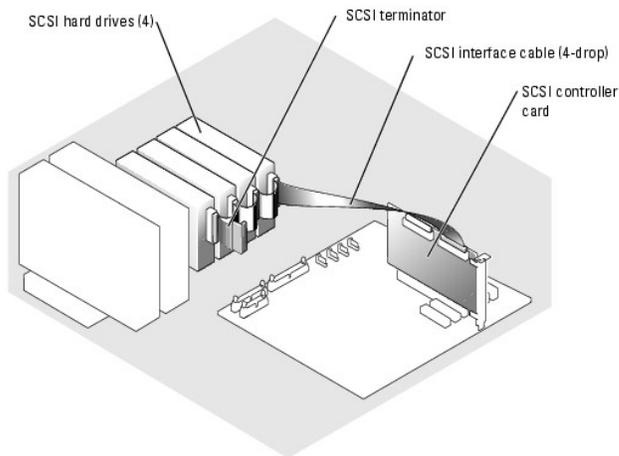
6. Ensure that all cables are firmly connected and arranged so that they will not catch on the computer cover or block airflow inside the system.

7. Install the cooling shroud. See "Installing the Cooling Shroud" in "Installing System Components."

8. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

9. Stand the system upright.

10. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

11. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

12. Partition and logically format the hard drive. See the operating system documentation for more information.

13. Install any required device drivers.

14. Run the hard drive tests in the system diagnostics to determine whether the drive operates properly. See "Running the System Diagnostics."

    If the drive is connected to a SATA RAID controller card, see the RAID controller card documentation for information on testing the controller.

    If the drive is connected to a SCSI controller card, run the SCSI controller tests and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

    If the hard drive fails the hard-drive tests or does not operate properly, see "Getting Help."

Front-Access SCSI Hard Drives (Non-Hot-Plug)

The drive bays in a system with an optional SCSI backplane board and optional non-RAID SCSI controller card provide space for up to four front-access SCSI hard drives. The hard drives plug into the SCSI backplane board, which is connected to the controller card (see Figure 7-10.) For instructions on installing the optional SCSI backplane board, see "Installing the Optional SCSI Backplane Board."

Figure 7-10. SCSI Hard Drives Connected to a SCSI Controller Card

Figure: SCSI hard drives (4), SCSI backplane board, SCSI interface cable (unterminated), optical drive, optional drive, SCSI controller card
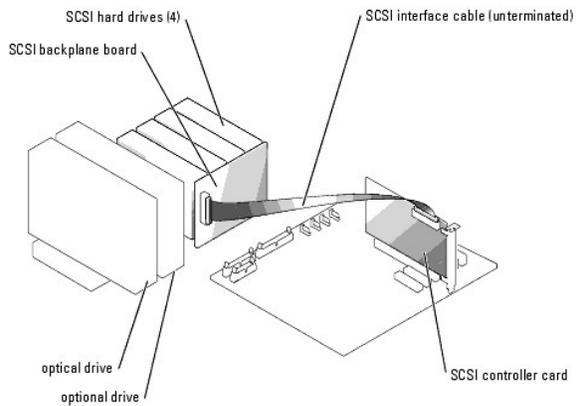
Removing a Front-Access SCSI Hard Drive (Non-Hot-Plug)

⊘ **NOTICE:** To prevent data loss, you must shut down the system before removing a SCSI drive carrier, unless a SCSI RAID controller is connected to the SCSI backplane. See "Hot-Plug SCSI Hard Drives" for information on hot-plug drive requirements and operation.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Open the hard-drive carrier handle to release the drive. See Figure 7-11.

4. Slide the hard drive out until it is free of the drive bay.

Figure 7-11. Removing or Installing a SCSI Hard-Drive Carrier

Figure: hard-drive carrier handle, SCSI hard drives (up to 4)
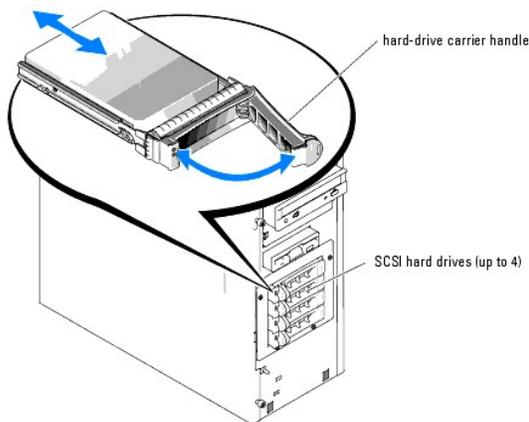
Installing a Front-Access SCSI Hard Drive (Non-Hot-Plug)

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Open the hard-drive carrier handle. See Figure 7-11.

⊘ **NOTICE:** Do not insert a hard-drive carrier and attempt to lock its handle next to a partially installed carrier. Doing so can damage the partially installed carrier's shield spring and make it unusable. Ensure that the adjacent drive carrier is fully installed.

4. Insert the hard-drive carrier into the drive bay. See Figure 7-11.

5. Close the hard-drive carrier handle to lock it in place.

6. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

7. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

8. Install any required SCSI device drivers.

9. Run the SCSI controllers tests and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

   If the hard drive fails the hard-drive tests or does not operate properly, see "Getting Help."

Hot-Plug SCSI Hard Drives

Systems with an optional SCSI backplane board and an optional SCSI RAID controller card support up to four hot-plug hard drives. The hard drives plug into the SCSI backplane board, which is connected to channel A on the optional SCSI RAID controller card (see Figure 7-12). For instructions on installing the optional SCSI backplane board, see "Installing the Optional SCSI Backplane Board."

**Figure 7-12. Hot-Plug SCSI Hard Drives Connected to a SCSI RAID Controller Card**
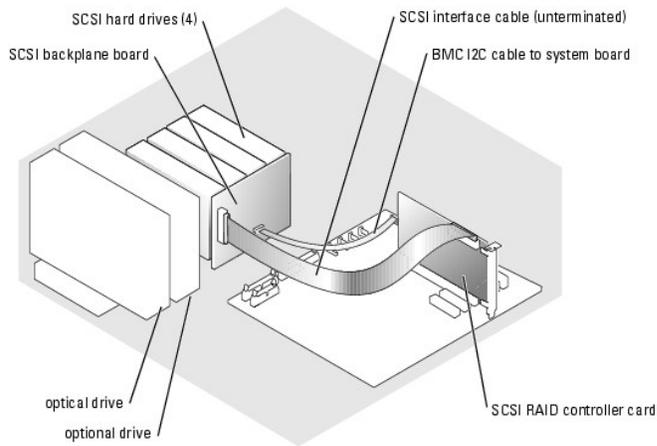
Removing a Hot-Plug SCSI Hard Drive

🚫 **NOTICE:** Not all operating systems support hot-plug drive installation. See the operating system documentation to confirm that the operating system supports this feature.

1. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

2. Take the hard drive offline and wait until the hard-drive indicator codes on the drive carrier signal that the drive can be removed safely. See Table 2-3 for a list of hard-drive indicator codes.

   If the drive has been online, the drive status indicator will blink green 2 times per second as the drive is powered down. When all indicators are off, the drive is ready for removal.

   See your operating system documentation for more information on taking the hard drive offline.

3. Open the hard-drive carrier handle to release the drive. See Figure 7-11.

4. Slide the hard drive out until it is free of the drive bay.

Installing a Hot-Plug SCSI Hard Drive

1. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

2. Open the hard-drive carrier handle. See Figure 7-11.

🚫 **NOTICE:** Do not insert a hard-drive carrier and attempt to lock its handle next to a partially installed carrier. Doing so can damage the partially installed carrier's shield spring and make it unusable. Ensure that the adjacent drive carrier is fully installed.

3. Insert the hard-drive carrier into the drive bay. See Figure 7-11.

4. Close the hard-drive carrier handle to lock it in place.

5. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

6. Install any required SCSI device drivers.

7. Run the SCSI controllers tests and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

   If the hard drive fails the hard-drive tests or does not operate properly, see "Getting Help."

Installing the Optional SCSI Backplane Board

The optional SCSI backplane board supports front-access SCSI drives (if an optional SCSI controller card is installed in the system) or hot-plug SCSI drives (if an optional RAID controller card is installed in the system). A new drive cage is supplied with the SCSI backplane.

⚠ **CAUTION: See the *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

2. Remove the bezel. See "Removing the Bezel" in "Troubleshooting Your System."

3. Lay the system on its right side.

4. Remove the cover. See "Removing the Cover" in "Troubleshooting Your System."

5. Remove the cooling shroud. See "Removing the Cooling Shroud" in "Installing System Components."

6. Disconnect the SATA or SCSI interface cables from the hard drives.

7. Disconnect the wiring harness from power cable connector P3.

8. Remove the hard-drive bay from the system. See Figure 7-6.

   a. Loosen the four screws that secure the drive bay to the system.

      Retain the screws to use when installing the new drive cage.

   b. Slide the hard-drive bay out of the system.

9. Slide the new drive cage into the system and secure it with the four Phillips screws you removed in step 8.

10. Install the SCSI backplane:

    a. Lower the backplane into the system and align the backplane with the retention hooks on the drive cage, then fit the backplane over the retention hooks.

    b. Slide the backplane board toward the front fan about 12 mm (0.5 inch).

    c. Secure the backplane with the thumbscrew. See Figure 7-13.

Figure 7-13. Installing the SCSI Backplane Board

backplane

power cable connector P3

SCSI data cable

BMC I2C cable

thumbscrew
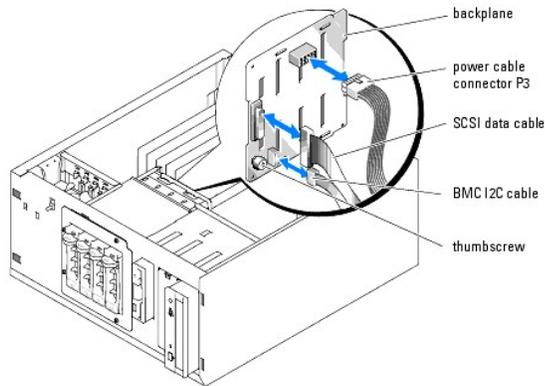
11. Connect the power cable connector P3 to the power connector on the SCSI backplane. See Figure 7-13.

12. Connect the baseboard management controller (BMC) inter-IC (I2C) cable to the SCSI backplane. See Figure 7-13.

13. Connect the other end of the BMC I2C cable to connector BP_I2C on the system board. See Figure A-3.

14. Install the SCSI controller card.

    See "Installing an Expansion Card" in "Installing System Components" for instructions about installing the card.

15. Connect the SCSI data cable to the SCSI controller card, and to the SCSI interface connector on the backplane. See Figure 7-12 and Figure 7-13.

16. Install the cover. See "Replacing the Cover" in "Troubleshooting Your System."

17. Stand the system upright.

18. Install the SCSI drives into the hard-drive bay.

    See Figure 7-11.

19. Install the bezel. See "Installing the Bezel" in "Troubleshooting Your System."

20. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.

21. Install any required SCSI device drivers.

22. Run the SCSI controllers tests and the hard-drive tests in the system diagnostics. See "Running the System Diagnostics."

Installing a RAID Controller Card

See "Installing an Expansion Card" in "Installing System Components" for instructions about installing the card.

Back to Contents Page

Getting Help

Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

- Technical Assistance
- Dell Enterprise Training and Certification
- Problems With Your Order
- Product Information
- Returning Items for Warranty Repair or Credit
- Before You Call
- Contacting Dell

Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the procedures in "Troubleshooting Your System."

2. Run the system diagnostics and record any information provided.

3. Make a copy of the Diagnostics Checklist, and fill it out.

4. Use Dell's extensive suite of online services available at Dell Support at **support.dell.com** for help with installation and troubleshooting procedures.

   For more information, see "Online Services."

5. If the preceding steps have not resolved the problem, call Dell for technical assistance.

NOTE: Call technical support from a phone near or at the system so that technical support can assist you with any necessary procedures.

NOTE: Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using the technical support service, see "Technical Support Service" and "Before You Call."

NOTE: Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Online Services

You can access Dell Support at **support.dell.com**. Select your region on the **WELCOME TO DELL SUPPORT** page, and fill in the requested details to access help tools and information.

You can contact Dell electronically using the following addresses:

- World Wide Web

  www.dell.com/

  www.dell.com/ap/ (Asian/Pacific countries only)

  www.dell.com/jp (Japan only)

  www.euro.dell.com (Europe only)

  www.dell.com/la (Latin American countries)

  www.dell.ca (Canada only)

- Anonymous file transfer protocol (FTP)

  ftp.dell.com/

  Log in as user:anonymous, and use your e-mail address as your password.

- Electronic Support Service

  support@us.dell.com

  apsupport@dell.com (Asian/Pacific countries only)

support.jp.dell.com (Japan only)

support.euro.dell.com (Europe only)

l   Electronic Quote Service

sales@dell.com

apmarketing@dell.com (Asian/Pacific countries only)

sales_canada@dell.com (Canada only)

l   Electronic Information Service

info@dell.com

AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop computer systems.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions.

The AutoTech service is available 24 hours a day, 7 days a week. You can also access this service through the technical support service. See the contact information for your region.

Automated Order-Status Service

To check on the status of any Dell™ products that you have ordered, you can go to **support.dell.com**, or you can call the automated order-status service. A recording prompts you for the information needed to locate and report on your order. See the contact information for your region.

Technical Support Service

Dell's technical support service is available 24 hours a day, 7 days a week, to answer your questions about Dell hardware. Our technical support staff use computer-based diagnostics to provide fast, accurate answers.

To contact Dell's technical support service, see "Before You Call" and then see the contact information for your region.

Dell Enterprise Training and Certification

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

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip available when you call. See the contact information for your region.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at **www.dell.com**. For the telephone number to call to speak to a sales specialist, see the contact information for your region.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1.   Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.

     For the telephone number to call, see the contact information for your region.

2.   Include a copy of the invoice and a letter describing the reason for the return.

3.   Include a copy of any diagnostic information (including the Diagnostics Checklist) indicating the tests you have run and any error messages reported by

the system diagnostics.

4. Include any accessories that belong with the item(s) being returned (such as power cables, media such as CDs and diskettes, and guides) if the return is for credit.

5. Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

Before You Call

NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the [Diagnostics Checklist](). If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer system itself. Ensure that the system documentation is available.

⚠️ **CAUTION: Before servicing any components inside your computer, see your *Product Information Guide* for important safety information.**

Diagnostics Checklist
Name:
Date:
Address:
Phone number:
Service Tag (bar code on the back of the computer):
Express Service Code:
Return Material Authorization Number (if provided by Dell support technician):
Operating system and version:
Peripherals:
Expansion cards:
Are you connected to a network? Yes No
Network, version, and network card:
Programs and versions:
See your operating system documentation to determine the contents of the system's start-up files. If possible, print each file. Otherwise, record the contents of each file before calling Dell.
Error message, beep code, or diagnostic code:
Description of problem and troubleshooting procedures you performed:

Contacting Dell

To contact Dell™ electronically, you can access the following websites:

l **www.dell.com**

l **support.dell.com** (technical support)

l **premiersupport.dell.com** (technical support for educational, government, healthcare, and medium/large business customers, including Premier, Platinum, and Gold customers)

For specific web addresses for your country, find the appropriate country section in the table below.

📝 **NOTE:** Toll-free numbers are for use within the country for which they are listed.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and

Country (City) International Access Code Country Code City Code		Toll-Free Numbers
Anguilla	General Support	toll-free: 800-335-0031
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires)	Website: **www.dell.com.ar**	
	E-mail: us_latin_services@dell.com	
International Access Code: **00**	E-mail for desktop and portable computers: la-techsupport@dell.com	
Country Code: **54**	E-mail for servers and EMC: la_enterprise@dell.com	
City Code: **11**	Customer Care	toll-free: 0-800-444-0730
	Tech Support	toll-free: 0-800-444-0733
	Tech Support Services	toll-free: 0-800-444-0724
	Sales	0-810-444-3355
Aruba	General Support	toll-free: 800-1578
Australia (Sydney)	E-mail (Australia): au_tech_support@dell.com	
	E-mail (New Zealand): nz_tech_support@dell.com	
International Access Code: **0011**	Home and Small Business	1-300-655-533
	Government and Business	toll-free: 1-800-633-559
Country Code: **61**	Preferred Accounts Division (PAD)	toll-free: 1-800-060-889
City Code: **2**	Customer Care	toll-free: 1-800-819-339
	Technical Support (portables and desktops)	toll-free: 1-300-655-533
	Technical Support (servers and workstations)	toll-free: 1-800-733-314
	Corporate Sales	toll-free: 1-800-808-385
	Transaction Sales	toll-free: 1-800-808-312
	Fax	toll-free: 1-800-818-341
Austria (Vienna)	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
International Access Code: **900**	Home/Small Business Sales	0820 240 530 00
	Home/Small Business Fax	0820 240 530 49
Country Code: **43**	Home/Small Business Customer Care	0820 240 530 14
City Code: **1**	Preferred Accounts/Corporate Customer Care	0820 240 530 16
	Home/Small Business Technical Support	0820 240 530 14
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	0820 240 530 00
Bahamas	General Support	toll-free: 1-866-278-6818
Barbados	General Support	1-800-534-3066
Belgium (Brussels)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail for French Speaking Customers: **support.euro.dell.com/be/fr/emaildell/**	
Country Code: **32**	Technical Support	02 481 92 88
	Technical Support Fax	02 481 92 95
City Code: **2**	Customer Care	02 713 15 .65
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	General Support	1-800-342-0671
Bolivia	General Support	toll-free: 800-10-0238
Brazil	Website: **www.dell.com/br**	
International Access Code: **00**	Customer Support, Technical Support	0800 90 3355
	Technical Support Fax	51 481 5470
Country Code: **55**	Customer Care Fax	51 481 5480
City Code: **51**	Sales	0800 90 3390
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei	Customer Technical Support (Penang, Malaysia)	604 633 4966
Country Code: **673**	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario)	Online Order Status: **www.dell.ca/ostatus**	
International Access Code:	AutoTech (automated technical support)	toll-free: 1-800-247-9362

011	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago) Country Code: **56** City Code: **2**	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
China (Xiamen) Country Code: **86** City Code: **592**	Technical Support website: **support.dell.com.cn**	
	Technical Support E-mail: cn_support@dell.com	
	Customer Care E-mail: customer_cn@dell.com	
	Technical Support Fax	818 1350
	Technical Support (Dimension™ and Inspiron™)	toll-free: 800 858 2969
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	toll-free: 800 858 0950
	Technical Support (servers and storage)	toll-free: 800 858 0960
	Technical Support (projectors, PDAs, printers, switches, routers, and so on)	toll-free: 800 858 2920
	Customer Care	toll-free: 800 858 2060
	Customer Care Fax	592 818 1308
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: **00** Country Code: **420**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	22537 2727
	Customer Care	22537 2707
	Fax	22537 2714
	Tech Fax	22537 2728
	Switchboard	22537 2711
Denmark (Copenhagen) International Access Code: **00** Country Code: **45**	Website: **support.euro.dell.com**	
	E-mail: http://support.euro.dell.com/dk/da/emaildell/	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Switchboard Fax (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Switchboard Fax (Home/Small Business)	3287 5001
Dominica	General Support	toll-free: 1-866-278-6821
Dominican Republic	General Support	1-800-148-0530
Ecuador	General Support	toll-free: 999-119
El Salvador	General Support	01-899-753-0777
Finland (Helsinki)	Website: **support.euro.dell.com**	

International Access Code: **990**	E-mail: http://support.euro.dell.com/fi/fi/emaildell/	
	Technical Support	09 253 313 60
Country Code: **358**	Customer Care	09 253 313 38
	Fax	09 253 313 99
City Code: **9**	Switchboard	09 253 313 00
France (Paris) (Montpellier)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/fr/fr/emaildell/**	
	Home and Small Business	
Country Code: **33**	Technical Support	0825 387 270
City Codes: **(1) (4)**	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: tech_support_central_europe@dell.com	
	Technical Support	06103 766-7200
Country Code: **49**	Home/Small Business Customer Care	0180-5-224400
City Code: **6103**	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
Greece	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/gr/en/emaildell/**	
	Technical Support	00800-44 14 95 18
Country Code: **30**	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	General Support	toll-**free: 1**-866-540-3355
Guatemala	General Support	1-800-999-0136
Guyana	General Support	toll-**free: 1**-877-270-4609
Hong Kong	Website: **support.ap.dell.com**	
International Access Code: **001**	Technical Support E-mail: apsupport@dell.com	
	Technical Support (Dimension and Inspiron)	2969 3188
Country Code: **852**	Technical Support (OptiPlex, Latitude, and Dell Precision)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	Customer Care	3416 0910
	Large Corporate Accounts	3416 0907
	Global Customer Programs	3416 0908
	Medium Business Division	3416 0912
	Home and Small Business Division	2969 3105
India	Technical Support	1600 33 8045
	Sales (Large Corporate Accounts)	1600 33 8044
	Sales (Home and Small Business)	1600 33 8046
Ireland (Cherrywood)	Website: **support.euro.dell.com**	
International Access Code: **16**	E-mail: dell_direct_support@dell.com	
	Technical Support	1850 543 543
Country Code: **353**	U.K. Technical Support (dial within U.K. only)	0870 908 0800

City Code: **1**	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	1850 200 982
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	Fax/Sales Fax	01 204 0103
	Switchboard	01 204 4444
Italy (Milan)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/it/it/emaildell/**	
	Home and Small Business	
Country Code: **39**	Technical Support	02 577 826 90
City Code: **02**	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	General Support (dial from within Jamaica only)	1-800-682-3639
Japan (Kawasaki)	Website: **support.jp.dell.com**	
International Access Code: **001**	Technical Support (servers)	toll-free: 0120-198-498
	Technical Support outside of Japan (servers)	81-44-556-4162
Country Code: **81**	Technical Support (Dimension and Inspiron)	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
City Code: **44**	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free:0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (PDAs, projectors, printers, routers)	toll-free: 0120-981-690
	Technical Support outside of Japan (PDAs, projectors, printers, routers)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Switchboard	044-556-4300
Korea (Seoul)	Technical Support	toll-free: 080-200-3800
International Access Code: **001**	Sales	toll-free: 080-200-3600
	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: **82**	Fax	2194-6202
	Switchboard	2194-6000
City Code: **2**	Technical Support (Electronics and Accessories)	toll-free: 080-200-3801
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600
		or 512 728-3772
Luxembourg	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: tech_be@dell.com	
	Technical Support (Brussels, Belgium)	3420808075
Country Code: **352**	Home/Small Business Sales (Brussels, Belgium)	toll-free: 080016884
	Corporate Sales (Brussels, Belgium)	02 481 91 00

	Customer Care (Brussels, Belgium)	02 481 91 19
	Fax (Brussels, Belgium)	02 481 92 99
	Switchboard (Brussels, Belgium)	02 481 91 00
Macao	Technical Support	toll-**free: 0800 105**
	Customer Service (Xiamen, China)	34 160 910
Country Code: **853**	Transaction Sales (Xiamen, China)	29 693 115
Malaysia (Penang)	Website: **support.ap.dell.com**	toll-**free: 1 800 88 0193**
	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-**free: 1 800 88 1306**
International Access Code: **00**	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	
Country Code: **60**	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free: 1800 88 1386**
City Code: **4**	Customer Service (**Penang, Malaysia**)	04 633 4949
	Transaction Sales	toll-**free: 1 800 888 202**
	Corporate Sales	toll-**free: 1 800 888 213**
Mexico	Customer Technical Support	001-877-384-8979
International Access Code: **00**		or 001-877-269-3383
Country Code: **52**	Sales	50-81-8800
		or 01-800-888-3355
	Customer Service	001-877-384-8979
		or 001-877-269-3383
	Main	50-81-8800
		or 01-800-888-3355
Montserrat	General Support	toll-**free: 1-866-278-6822**
Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support	020 674 45 00
	Technical Support Fax	020 674 47 66
Country Code: **31**	Home/Small Business Customer Care	020 674 42 00
City Code: **20**	Relational Customer Care	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand	E-mail (New Zealand): nz_tech_support@dell.com	
International Access Code: **00**	E-mail (Australia): au_tech_support@dell.com	
	Technical Support (for desktop and portable computers)	toll-**free: 0800 446 255**
Country Code: **64**	Technical Support (for servers and workstations)	toll-**free: 0800 443 563**
	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
Nicaragua	General Support	001-800-220-1006
Norway (Lysaker)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: http://support.euro.dell.com/no/no/emaildell/	
	Technical Support	671 16882
Country Code: **47**	Relational Customer Care	671 17575
	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw)	Website: **support.euro.dell.com**	
	E-mail: pl_support_tech@dell.com	
International Access Code: **011**	Customer Service Phone	57 95 700
Country Code: **48**	Customer Care	57 95 999
	Sales	57 95 999
City Code: **22**	Customer Service Fax	57 95 806

	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal International Access Code: **00** Country Code: **351**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/pt/en/emaildell/**	
	Technical Support	707200149
	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	General Support	1-800-805-7545
St. Kitts and Nevis	General Support	toll-**free:** 1-877-441-4731
St. Lucia	General Support	1-800-882-1521
St. Vincent and the Grenadines	General Support	toll-**free:** 1-877-270-4609
Singapore (Singapore) International Access Code: **005** Country Code: **65**	Website: **support.ap.dell.com**	
	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	toll-**free:** 1800 394 7430
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-**free:** 1800 394 7488
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free:** 1800 394 7478
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-**free:** 1 800 394 7412
	Corporate Sales	toll-**free:** 1 800 394 7419
Slovakia (Prague) International Access Code: **00** Country Code: **421**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	02 5441 5727
	Customer Care	420 22537 2707
	Fax	02 5441 8328
	Tech Fax	02 5441 8328
	Switchboard (Sales)	02 5441 7585
South Africa (Johannesburg) International Access Code: **09/091** Country Code: **27** City Code: **11**	Website: **support.euro.dell.com**	
	E-mail: dell_za_support@dell.com	
	Gold Queue	011 709 7713
	Technical Support	011 709 7710
	Customer Care	011 709 7707
	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid) International Access Code: **00** Country Code: **34** City Code: **91**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/es/es/emaildell/**	
	Home and Small Business	
	Technical Support	902 100 130
	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Care	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby) International Access Code: **00** Country Code: **46** City Code: **8**	Website: **support.euro.dell.com**	
	E-mail: http://support.euro.dell.com/se/sv/emaildell/	
	Technical Support	08 590 05 199
	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	20 140 14 44
	Technical Support Fax	08 590 05 594
	Sales	08 590 05 185
Switzerland (Geneva)	Website: **support.euro.dell.com**	

International Access Code: **00** Country Code: **41** City Code: **22**	E-mail: Tech_support_central_Europe@dell.com	
	E-mail for French-speaking HSB and Corporate Customers: **support.euro.dell.com/ch/fr/emaildell/**	
	Technical Support (Home and Small Business)	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan International Access Code: **002** Country Code: **886**	Website: **support.ap.dell.com**	
	E-mail: ap_support@dell.com	
	Technical Support (OptiPlex, Latitude, Inspiron, Dimension, and Electronics and Accessories)	toll-**free**: 00801 86 1011
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free**: 00801 60 1256
	Transaction Sales	toll-**free**: 00801 65 1228
	Corporate Sales	toll-**free**: 00801 651 227
Thailand International Access Code: **001** Country Code: **66**	Website: **support.ap.dell.com**	
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-**free**: 1800 0060 07
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free**: 1800 0600 09
	Customer Service (Penang, Malaysia)	604 633 4949
	Corporate Sales	toll-**free**: 1800 006 009
	Transaction Sales	toll-**free**: 1800 006 006
Trinidad/Tobago	General Support	1-800-805-8035
Turks and Caicos Islands	General Support	toll-**free**: 1-866-540-3355
U.K. (Bracknell) International Access Code: **00** Country Code: **44** City Code: **1344**	Website: **support.euro.dell.com**	
	Customer Care website: **support.euro.dell.com/uk/en/ECare/Form/Home.asp**	
	E-mail: dell_direct_support@dell.com	
	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct and general)	0870 908 0800
	Global Accounts Customer Care	01344 373 186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	01344 373 185
	Preferred Accounts (500–5000 employees) Customer Care	0870 906 0010
	Central Government Customer Care	01344 373 193
	Local Government & Education Customer Care	01344 373 199
	Health Customer Care	01344 373 194
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Home and Small Business Fax	0870 907 4006
Uruguay	General Support	toll-**free**: 000-413-598-2521
U.S.A. (Austin, Texas) International Access Code: **011** Country Code: **1**	Automated Order-Status Service	toll-**free**: 1-800-433-9014
	AutoTech (portable and desktop computers)	toll-**free**: 1-800-247-9362
	Consumer (Home and Home Office)	
	Technical Support	toll-**free**: 1-800-624-9896
	Customer Service	toll-**free**: 1-800-624-9897
	DellNet™ Service and Support	toll-**free**: 1-877-Dellnet (1-877-335-5638)
	Employee Purchase Program (EPP) Customers	toll-**free**: 1-800-695-8133
	Financial Services website: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-**free**: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-**free**: 1-800-283-2210
	Business	
	Customer Service and Technical Support	toll-**free**: 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-**free**: 1-800-695-8133
	Printers and Projectors Technical Support	toll-**free**: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-**free**: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-**free**: 1-800-234-1490

	Dell Sales	toll-**free:** 1-800-289-3355
		or toll-**free:** 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-**free:** 1-888-798-7561
	Software and Peripherals Sales	toll-**free:** 1-800-671-3355
	Spare Parts Sales	toll-**free:** 1-800-357-3355
	Extended Service and Warranty Sales	toll-**free:** 1-800-247-4618
	Fax	toll-**free:** 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-**free:** 1-877-DELLTTY
		(1-877-335-5889)
U.S. Virgin Islands	General Support	1-877-673-3355
Venezuela	General Support	8001-3605

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Dell™ PowerEdge™ 800 Systems Installation and Troubleshooting Guide

Notes, Notices, and Cautions

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

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

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the Glossary in your *User's Guide*.

Jumpers, Switches, and Connectors

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Jumpers—A General Explanation
- System Board Jumpers
- System Board Connectors
- Riser Card Connectors
- Disabling a Forgotten Password

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


Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When reconfiguring the system, you may need to change jumper settings on circuit boards 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. Figure A-1 shows an example of a jumper.

Figure A-1. Example Jumper

A jumper is referred to as open or unjumpered 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 jumpered. The jumper setting is often shown in text as two numbers, such as 1–2. The number 1 is printed on the circuit board with a triangle so that you can identify each pin number based on the location of pin 1.

Figure A-2 shows the location and default settings of the server-module jumper blocks. See Table A-1 for the designations, default settings, and functions of the jumpers.

System Board Jumpers

Figure A-2 shows the location of the configuration jumpers on the system board. Table A-1 lists the jumper settings.

Figure A-2. System Board Jumpers

Table A-1. System Board Jumper Settings

Jumper	Setting	Description
PASSWD_EN	▣▣ (default)	The password feature is enabled.
	⊙▣▣	The password feature is disabled.
NVRAM_CLR	⊙▣▣ (default)	The configuration settings in NVRAM are retained at system boot.
	▣▣	The configuration settings in NVRAM are cleared at next system boot.
▣▣ jumpered ⊙▣▣ unjumpered		

System Board Connectors

See <u>Figure A-3</u> and <u>Table A-2</u> for the location and description of the system board connectors.

Figure A-3. System Board Connectors
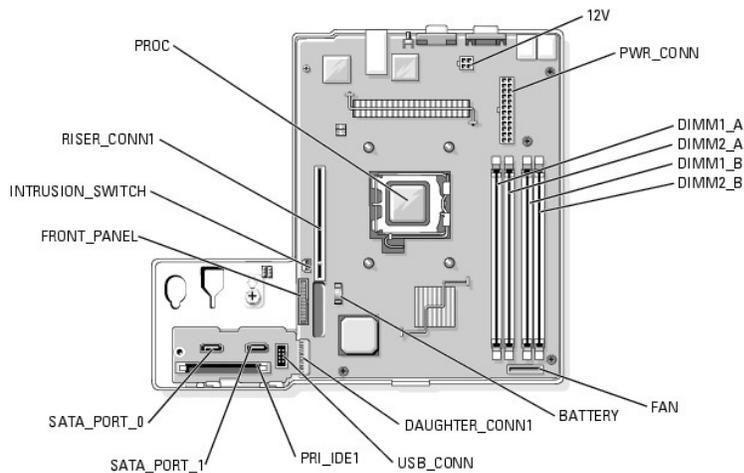
Table A-2. System Board Connectors

Connector	Description
12V	power supply connector
BATTERY	Connector for the 3.0 V coin battery
DAUGHTER_CONN1	Connector for the daughter card
DIMM*n*_ *x*	Memory modules (4)
FAN	Power connector for the fans
FRONT_PANEL	Control panel interface connector
INTRUSION_SWITCH	Connector for the chassis intrusion switch
PRI_IDE1	Optical drive interface connector
PROC	Processor socket
PWR_CONN	power supply connector
RISER_CONN1	Riser card interface connector
SATA_PORT_*n*	Connectors for the SATA hard drives
USB_CONN	Control panel interface connector

Riser Card Connectors

The system is available with either a PCIe riser card or a PCI-X/PCIe riser card. See <u>Figure A-4</u> and <u>Figure A-5</u> for the location and description of the expansion-card slots on the two riser cards.

**Figure A-4. PCIe Riser Card Connectors**
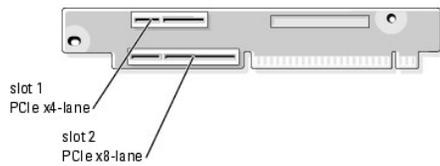
Figure A-5. PCI-X/PCIe Riser Card Connectors
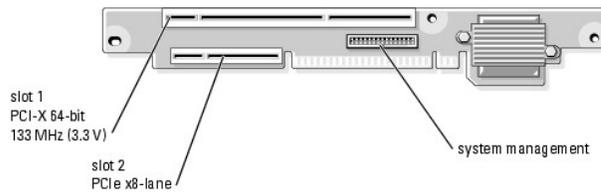
Disabling a Forgotten Password

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

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System" in "Troubleshooting Your System."

3. Remove the password jumper plug.

   See Figure A-2 to locate the password jumper on the system board.

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

5. Reconnect the system to the electrical outlet, and turn on the system.

   The existing passwords are not disabled (erased) until the system boots with the password 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.

6. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

7. Open the system.

8. Install the password jumper plug.

   See Figure A-2 to locate the password jumper on the system board.

9. Close the system, reconnect the system to the electrical outlet, and turn on the system.

10. Assign a new system and/or setup password.

    To assign a new password using the System Setup program, see "Using the System Setup Program" in your *User's Guide.*

Back to Contents Page

I/O Connectors

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- I/O Connectors
- Serial Connector
- PS/2-Compatible Keyboard and Mouse Connectors
- Video Connector
- USB Connector
- Integrated NIC Connector
- Embedded Remote Access Ethernet Connector
- Network Cable Requirements

I/O Connectors

I/O connectors are the gateways that the system uses to communicate with external devices, such as a keyboard, mouse, printer, or monitor. This section describes the various connectors on your system. If you reconfigure the hardware connected to the system, you may also need the pin number and signal information for these connectors. Figure B-1 and Figure B-2 illustrate the connectors on the system front and back panels.

Figure B-1. Front-Panel I/O Connectors
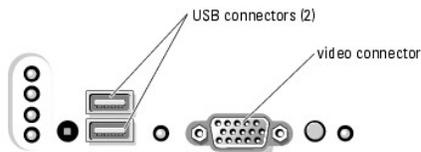
Figure B-2. Back-Panel I/O Connectors

Table B-1 shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
IOIOI	Serial connector
⊸▣	Mouse connector
▥	Keyboard connector
�	Video connector
•⇆	USB connector
⬡	NIC connector

Serial Connector

Serial connectors support devices such as external modems, printers, and mice that require serial data transmission. The serial connector uses a 9-pin D-subminiature connector.

## Serial Connector Autoconfiguration

The default designation of the integrated serial connector is COM1. When you add an expansion card containing a serial connector that has the same designation as the integrated connector, the system's autoconfiguration feature remaps (reassigns) the integrated serial connector to the next available designation. Both the new and the remapped COM connectors share the same IRQ setting. COM1 and COM3 share IRQ4, while COM2 and COM4 share IRQ3.

> NOTE: If two COM connectors share an IRQ setting, you may not be able to use them both at the same time. In addition, if you install one or more expansion cards with serial connectors designated as COM1 and COM3, the integrated serial connector is disabled.

Before adding a card that remaps the COM connectors, check the documentation that came with the software to make sure that the software can accommodate the new COM connector designation.

Figure B-3 illustrates the pin numbers for the serial connector and Table B-2 defines the pin assignments for the connector.

Figure B-3. Serial Connector Pin Numbers
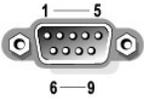
Table B-2. Serial Connector Pin Assignments

Pin	Signal	I/O	Definition
1	DCD	I	Data carrier detect
2	SIN	I	Serial input
3	SOUT	O	Serial output
4	DTR	O	Data terminal ready
5	GND	N/A	Signal ground
6	DSR	I	Data set ready
7	RTS	O	Request to send
8	CTS	I	Clear to send
9	RI	I	Ring indicator
Shell	N/A	N/A	Chassis ground

PS/2-Compatible Keyboard and Mouse Connectors

The PS/2-compatible keyboard and mouse cables attach to 6-pin, miniature DIN connectors. Figure B-4 illustrates the pin numbers for these connectors and Table B-3 defines the pin assignments for these connectors.

Figure B-4. PS/2-Compatible Keyboard and Mouse Connector Pin Numbers

Table B-3. Keyboard and Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	KBDATA or MFDATA	I/O	Keyboard data or mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	KBCLK or MFCLK	I/O	Keyboard clock or mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Video Connector

You can attach a VGA-compatible monitor to the system's integrated video controller using a 15-pin high-density D-subminiature connector. Figure B-5 illustrates the pin numbers for the video connector and Table B-4 defines the pin assignments for the connector.

NOTE: Installing a video card automatically disables the system's integrated video controller.

Figure B-5. Video Connector Pin Numbers
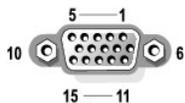
Table B-4. Video Connector Pin Assignments

Pin	Signal	I/O	Definition
1	RED	O	Red video
2	GREEN	O	Green video
3	BLUE	O	Blue video
4	NC	N/A	No connection
5–8, 10	GND	N/A	Signal ground
9	VCC	N/A	Vcc
11	NC	N/A	No connection
12	DDC data out	O	Monitor detect data
13	HSYNC	O	Horizontal synchronization
14	VSYNC	O	Vertical synchronization
15	DDC CLK	I/O	Monitor detect clock

USB Connector

The system's USB connector supports USB-compliant peripherals such as keyboards, mice, and printers and may also support USB-compliant devices such as diskette drives and CD drives. Figure B-6 illustrates the pin numbers for the USB connector and Table B-5 defines the pin assignments for the connector.

NOTICE: Do not attach a USB device or a combination of USB devices that draw a maximum current of more than 500 mA per channel or +5 V. Attaching devices that exceed this threshold may cause the USB connectors to shut down. See the documentation that accompanied the USB devices for their maximum current ratings.

Figure B-6. USB Connector Pin Numbers

Table B-5. USB Connector Pin Assignments

Pin	Signal	I/O	Definition
1	Vcc	N/A	Supply voltage
2	DATA	I	Data in
3	+DATA	O	Data out
4	GND	N/A	Signal ground

Integrated NIC Connector

The system's integrated NIC functions as a separate network expansion card while providing fast communication between servers and workstations. Figure B-7 illustrates the pin numbers for the NIC connectors and Table B-6 defines the pin assignments for the connectors.

Figure B-7. NIC Connector
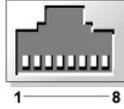
Table B-6. NIC Connector Pin Assignments

| Pin	Signal	I/O	Definition
1	TD+	O	Data out (+)
2	TD–	O	Data out (–)
3	RD+	I	Data in (+)
4	NC	N/A	No connection
5	NC	N/A	No connection
6	RD–	I	Data in (–)
7	NC	N/A	No connection
8	NC	N/A	No connection

Embedded Remote Access Ethernet Connector

The system's optional embedded remote access (ERA) circuitry is designed to provide remote access capabilities for the system. It is designed specifically to work with systems management software. <u>Figure B-8</u> illustrates the pin numbers for the ERA connector and <u>Table B-7</u> defines the pin assignments for the connector.

Figure B-8. Embedded Remote Access Ethernet Connector
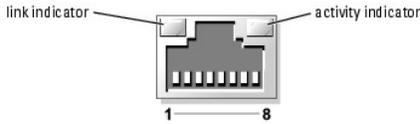
Table B-7. ERA Ethernet Connector Pin Assignments

Pin	Signal	I/O	Definition
1	TD+	O	Data out (+)
2	TD–	O	Data out (–)
3	RD+	I	Data in (+)
4	NC	N/A	No connection
5	NC	N/A	No connection
6	RD–	I	Data in (–)
7	NC	N/A	No connection
8	NC	N/A	No connection

Network Cable Requirements

The NIC supports a UTP Ethernet cable equipped with a standard RJ45-compatible plug. Observe the following cabling restrictions.

🚫 **NOTICE:** To avoid line interference, voice and data lines must be in separate sheaths.

- l Use Category 5 or greater wiring and connectors.
- l Do not exceed a cable run length (from a workstation to a hub) of 100 m (328 ft).

For detailed guidelines on operation of a network, see "Systems Considerations of Multi-Segment Networks" in the IEEE 802.3 standard.

Introduction

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

● Other Information You May Need

Your system includes the following significant service and upgrade features:

l   Baseboard Management Controller (BMC), 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. The BMC supports the industry-standard Intelligent Platform Management Interface (IPMI) specification.

l   System diagnostics, which checks for hardware problems (if the system can boot).

The following system options are offered:

l   Additional system memory

l   A variety of PCI-X and PCIe expansion-card options (including RAID controller cards)

l   IDE optical drive

l   Additional hard drives

Other Information You May Need

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

l   The *Rack Installation Guide* or *Rack Installation Instructions* included with your rack solution describes how to install your system into a rack.

l   The *Getting Started Guide* provides an overview of initially setting up your system.

l   The *User's Guide* provides information about system features and technical specifications.

l   CDs included with your system provide documentation and tools for configuring and managing your system.

l   Systems management software documentation describes the features, requirements, installation, and basic operation of the software.

l   Operating system documentation describes how to install (if necessary), configure, and use the operating system software.

l   Documentation for any components you purchased separately provides information to configure and install these options.

l   Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

📝 **NOTE:** Always check for updates on **support.dell.com** and read the updates first because they often supersede information in other documents.

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

Indicators, Messages, and Codes
Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Front-Panel Features
- Back-Panel Features
- NIC Indicators
- System Messages
- Diagnostics Indicator Codes
- System Beep Codes
- Warning Messages
- Diagnostics Messages
- Alert Messages
- Baseboard Management Controller Messages

The system, applications, and operating systems can identify problems and alert you to them. Any of the following can indicate when the system is not operating properly:

- System indicators
- System messages
- Beep codes
- Warning messages
- Diagnostics messages
- Alert messages

This section describes each type of message, lists the possible causes, and provides steps to resolve any problems indicated by a message. The system indicators and features are illustrated in this section.

Front-Panel Features

Figure 2-1 shows the controls, indicators, and connectors located behind the optional bezel on the front-panel. (To remove the optional bezel and access the front panel, press the latch at the left end of the bezel. See "Opening the System" in "Troubleshooting Your System" for detailed instructions on removing the bezel.) Table 2-1 describes the front-panel indicators, buttons, and connectors.

Figure 2-1. Front-Panel Features
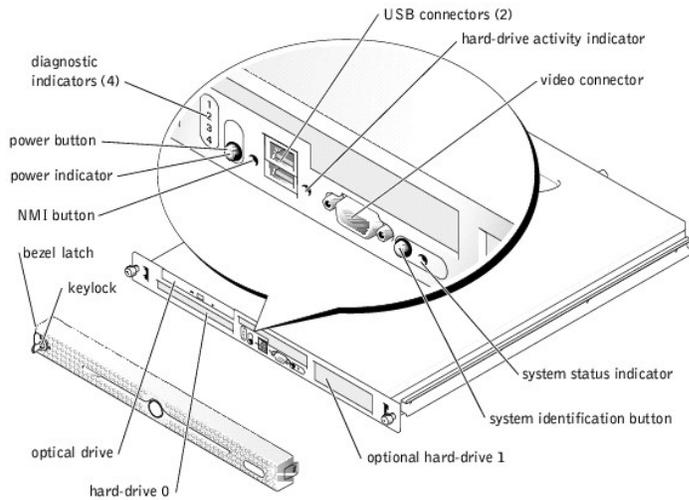
The optional locking system bezel incorporates blue and amber system status indicators. The blue indicator lights up when the system is operating correctly.

Table 2-1. Front-Panel LED Indicators, Buttons, and Connectors

Feature	Icon	Description
System status indicator	⊙	The blue system status indicator lights up during normal system operation.
		The amber system status indicator flashes when the system needs attention due to a system problem.

| System identification button		You can use the system identification buttons on the front and back panels to locate a particular system within a rack. When one of these buttons is pushed, the blue system status indicators on the front and back panels blink until one of the buttons is pushed again.
		You can also use the systems management software to cause the indicators to flash to identify a particular system.
Hard-drive indicator	🗄	The green hard-drive activity indicator flashes when the SATA hard drives are in use. **NOTE:** This indicator does not flash when SCSI hard drives are in use.
NMI button	↺	The NMI button is used to troubleshoot software and device driver errors when using certain operating systems. This button can be pressed using the end of a paper clip. Use this button only if directed to do so by qualified support personnel or by the operating system's documentation.
USB connectors	⇚	Connect USB 2.0-compliant devices to the system.
Video connector	▯	Connects a monitor to the system.
Power-on indicator, Power button	⏻	The power button turns system power off and on. **NOTICE:** If you turn off the system using the power button and the system is running an ACPI-compliant operating system, the system can perform an orderly shutdown before power is turned off. If the power button is pressed for more than 4 seconds, the system power will turn off regardless of the current operating system state. If the system is not running an ACPI-compliant operating system, power is turned off immediately after the power button is pressed. The power button is enabled in the System Setup program. When disabled, the button can only turn the system power on. For more information, see "Using the System Setup Program" in your *User's Guide*. The power-on indicator lights or blinks to indicate the status of power to the system. The power-on indicator lights when the system is on. The indicator is off when the system is off and power is disconnected from the system. The indicator blinks when the system is off but is connected to the power source.
Diagnostic indicators (4)		The diagnostic indicators aid in troubleshooting the system. For more information, see "Diagnostics Indicator Codes."

Back-Panel Features

Figure 2-2 shows the back-panel features of the system.

Figure 2-2. Back-Panel Features
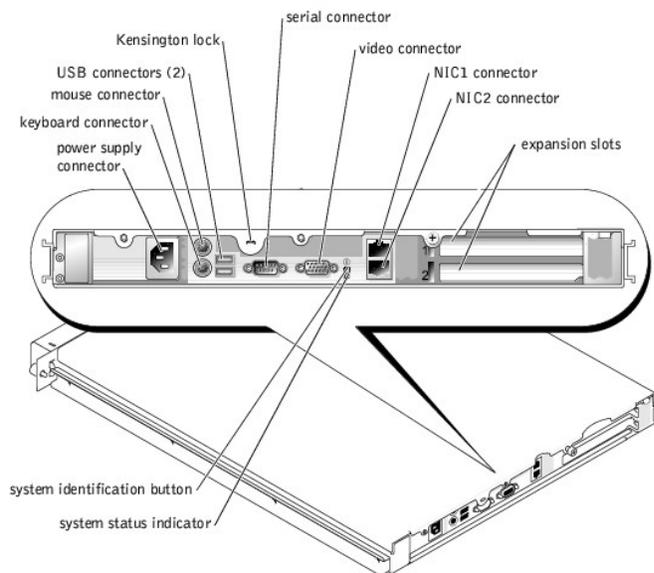

NIC Indicators

Figure 2-3. NIC Indicators
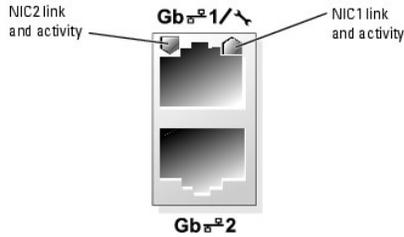
Table 2-2. NIC Indicators

Indicator Type	Indicator Code	Description
Activity	Off	When off at the same time that the link indicator is off, the NIC is not connected to the network or the NIC is disabled by the System Setup program. See "Using the System Setup Program" in the *User's Guide*.
	Blinking	Indicates that network data is being sent or received.
Link	Off	When off at the same time that the activity indicator is off, the NIC is not connected to the network or the NIC is disabled by the System Setup program. See "Using the System Setup Program" in the *User's Guide*.
	Green	Network connection is present.

System Messages

System messages appear on the screen to notify you of a possible problem with the system. Table 2-3 lists the system messages that can occur and the probable cause and corrective action for each message.

NOTE: If you receive a system message that is not listed in Table 2-3, check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-3. System Messages

Message	Causes	Corrective Actions
Amount of available memory limited to 256MB	The **OS Install Mode** option in the System Setup program is set to **On**. This limits the amount of available memory to 256 MB because some operating systems will not complete installation with more than 2 GB of system memory.	After the operating system is installed, enter the System Setup program and set the **OS Install Mode** option to **Off**. See your *User's Guide* for details.
Attempting to update Remote Configuration. Please wait....	Remote Configuration is in progress.	Wait until the process is complete.
BIOS Update Attempt Failed!	Remote BIOS update attempt failed.	Retry the BIOS update. If the problem persists, see "Getting Help."
Caution! NVRAM_CLR jumper is installed on system board.	NVRAM_CLR jumper is installed.	Check the System Setup configuration settings. See "Using the System Setup Program" in your *User's Guide*. Remove the NVRAM_CLR jumper. See Figure A-2 for jumper locations.
Data error	The diskette drive or hard drive cannot read the data.	For the operating system, run the appropriate utility to check the file structure of the diskette drive or hard drive. See your operating system documentation for information on running these utilities.
Decreasing available memory	One or more memory modules might be improperly seated or faulty.	Reinstall the memory modules and, if necessary, replace them. See "System Memory" in "Installing System Components." See "Troubleshooting System Memory" in "Troubleshooting Your System."
Diskette read failure	Faulty or improperly inserted diskette.	Replace the diskette.
Diskette subsystem reset failed	Faulty diskette drive or optical drive controller.	Ensure that the diskette drive and optical drive cables are properly connected. See "Troubleshooting a USB Device" and "Troubleshooting an Optical Drive" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Drive not ready	Diskette missing or improperly inserted in diskette drive.	Reinsert or replace the diskette.
Error: Incorrect memory configuration. Ensure memory in slots DIMM1_A and DIMM1_B, DIMM2_A and DIMM2_B match identically in size, speed and rank.	The installed memory modules are not matched pairs.	See "Memory Module Installation Guidelines" in "Installing System Components."
Error: Remote Access Controller initialization failure.	Faulty or improperly installed RAC.	Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."

|		
`Error 8602: Auxiliary device failure. Verify that mouse and keyboard are securely attached to correct connectors.`	Loose or improperly connected mouse or keyboard cable; faulty mouse or keyboard.	Replace the mouse. If the problem persists, replace the keyboard.
`Gate A20 failure`	Faulty keyboard controller (faulty system board).	See "Getting Help."
`General failure`	The operating system is unable to carry out the command.	This message is usually followed by specific information. Take the appropriate action to resolve the problem.
`IDE Primary drive 0 not found`	Primary drive 0 set as Auto, no disk.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
`Invalid memory configuration detected. Potential for data corruption exists!`	Unsupported DIMMs are installed in the system, or the memory configuration is incorrect.	Replace or reconfigure the DIMMs. See "System Memory" in "Installing System Components" for memory configuration guidelines, a list of supported DIMMs, and supported memory configurations.
`Keyboard controller failure`	Faulty keyboard controller (faulty system board).	See "Getting Help."

`Keyboard data line failure`
 	
`Keyboard failure`
 	
`Keyboard stuck key failure`
	Loose or improperly connected keyboard cable; faulty keyboard; faulty keyboard controller.	Ensure that the keyboard is properly connected. If the problem persists, replace the keyboard. If the problem persists, see "Getting Help."

`Keyboard fuse has failed.`	Keyboard fuse has failed.	Replace the keyboard.
	Faulty system board.	If the problem persists, the system board is faulty. See "Getting Help."
`Manufacturing mode detected`	System is incorrectly configured.	

`Memory address line failure at address, read value expecting value`
 	
`Memory double word logic failure at address, read value expecting value`
 	
`Memory odd/even logic failure at start address to end address`
 	
`Memory write/read failure at address, read value expecting value`
	Faulty or improperly installed memory modules, or faulty system board.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."

`Memory tests terminated by keystroke`	The spacebar was pressed during POST to terminate the memory test.	Information only.
`No boot device available`	The system cannot find the diskette or hard drive.	If the diskette drive is your boot device, ensure that a bootable disk is in the drive. If the hard drive is your boot device, ensure that the hard drive is installed, properly seated, and partitioned as a boot device. Enter the System Setup program and verify the boot sequence information. See your *User's Guide* for details.
`No boot sector on hard-disk drive`	The system configuration information in the System Setup program might be incorrect.	Enter the System Setup program and verify the system configuration information for the hard drive. See your *User's Guide* for details. If the message continues to appear after verifying the information in the System Setup program, the operating system might have been corrupted. Reinstall the operating system. See your operating system documentation for reinstallation information.
`No timer tick interrupt`	A chip on the system board might be malfunctioning.	Run the system diagnostics. See "Running the System Diagnostics."
`Not a boot diskette`	The operating system is trying to boot from a diskette that does not have a bootable operating system installed on it.	Insert a diskette that has a bootable operating system.
`PCI BIOS failed to install`	PCI device BIOS (Option ROM) checksum failure is detected during shadowing.	Ensure that all appropriate cables are securely connected to the expansion cards. If the problem persists, see "Troubleshooting Expansion Cards" in "Troubleshooting Your System."

`PCIe Degraded Link Width Error: Embedded Bus#nn/Dev#nn/Funcn`
 	
`Expected Link Width is n`
 	
`Actual Link Width is n`
	Faulty or improperly installed PCIe card.	Reseat the PCIe cards. See "Expansion Cards" in "Installing System Components." If the problem persists, see "Getting Help."

`PCIe Degraded Link Width Error: Slot n`
 	
`Expected Link Width is n`
 	
`Actual Link Width is n`
	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See "Expansion Cards" in "Installing System Components." If the problem persists, see "Getting Help."

`PCIe Training Error: Embedded Bus#nn/Dev#nn/Funcn`	Faulty or improperly installed PCIe card.	Reseat the PCIe cards. See "Expansion Cards" in "Installing System Components." If the problem persists, see "Getting Help."
`PCIe Training Error: Slot n`	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See "Expansion Cards" in "Installing System Components." If the

		problem persists, see "Getting Help."
Plug & Play Configuration Error	Error encountered in initializing PCI device; faulty system board.	Install the NVRAM_CLR jumper and reboot the system. See Figure A-2 for jumper location. Check for a BIOS update. If the problem persists, see "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Primary drive 0/1 configuration error	Faulty drive. Parameters failure.	Ensure that the hard drive cables are properly connected. See "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System."
Primary drive 0/1 failure	Faulty drive. INT13 call failure from the drive.	Ensure that the hard drive cables are properly connected. See "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System."
Read fault Requested sector not found	The operating system cannot read from the diskette or hard drive, the system could not find a particular sector on the disk, or the requested sector is defective.	Replace the diskette. Ensure that the diskette and hard-drive cables are properly connected. See "Troubleshooting a USB Device," "Troubleshooting SATA Hard Drives," or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.
Remote Configuration update attempt failed	System could not implement Remote Configuration request.	Retry Remote Configuration.
ROM bad checksum = address	Faulty or improperly installed expansion card.	Remove and reseat the expansion cards. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
SATA port 0/1 hard disk drive configuration error	Faulty drive. Parameters failure.	Ensure that the hard drive cables are properly connected. See "Troubleshooting SATA Hard Drives" in "Troubleshooting Your System."
SATA port 0/1 hard disk drive failure SATA port 0/1 hard disk drive auto-sensing error	Faulty drive. INT13 call failure from the drive.	Ensure that the hard drive cables are properly connected. See "Troubleshooting SATA Hard Drives" in "Troubleshooting Your System."
SATA Port 0/1 hard disk not found	SATA Port0/1 set as Auto, no disk installed.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your User's Guide.
Sector not found Seek error Seek operation failed	Faulty diskette or hard drive.	See "Troubleshooting a USB Device," "Troubleshooting SATA Hard Drives," or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive installed in your system.
Shutdown failure	Shutdown test failure.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
The amount of system memory has changed.	Faulty memory module. Information only, if you have changed the memory configuration.	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
The amount of tested memory is below the minimum system configuration. System halted!	Invalid memory configuration.	See "Memory Module Installation Guidelines" in "Installing System Components."
	Faulty memory module.	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Time-of-day clock stopped	Faulty battery; faulty system board.	See "Troubleshooting the System Battery" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Time-of-day not set – please run SETUP program	Incorrect Time or Date settings; faulty system battery.	Check the Time and Date settings. See "Using the System Setup Program" in your User's Guide. If the problem persists, see "Troubleshooting the System Battery" in "Troubleshooting Your System."
Timer chip counter 2 failed	Faulty system board.	See "Getting Help."
Unexpected interrupt in protected mode	Faulty or improperly installed memory modules or faulty system board.	Ensure that all memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, see "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
Utility partition not available	Utility partition is not available on the hard disk	Create a utility partition on the boot hard drive. See the CDs that came with your system.
Warning! No micro code update loaded for processor 0	Micro code update failed.	Update the BIOS firmware. See "Getting Help."
Write fault Write fault on selected drive	Faulty diskette, diskette drive, hard drive.	Replace the diskette. Ensure that the diskette drive and hard-drive cables are properly connected. See "Troubleshooting a USB Device," "Troubleshooting SATA Hard Drives," or "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.

Diagnostics Indicator Codes

The four diagnostics indicators on the system front panel display error codes during system startup. Table 2-4 lists the causes and possible corrective actions associated with these codes.

Table 2-4. Diagnostic Indicator Codes

Code	Causes	Corrective Action
A(yellow) B(yellow) C(green) D(yellow)	Possible processor failure.	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."
A(yellow) B(yellow) C(green) D(green)	Memory failure.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A(yellow) B(green) C(yellow) D(yellow)	Possible expansion card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
A(yellow) B(green) C(yellow) D(green)	Possible video card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
A(yellow) B(green) C(green) D(yellow)	Diskette drive or hard drive failure.	Ensure that the diskette drive and hard-drive are properly connected. See "Installing Drives" for information on the drives installed in your system.
A(yellow) B(green) C(green) D(green)	Possible USB failure.	See "Troubleshooting a USB Device" in "Troubleshooting Your System."
A(green) B(yellow) C(yellow) D(yellow)	No memory modules detected.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A(green) B(yellow) C(yellow) D(green)	System board failure.	See "Getting Help."
A(green) B(yellow) C(green) D(yellow)	Memory configuration error.	See "Troubleshooting System Memory" in "Troubleshooting Your System."
A(green) B(yellow) C(green) D(green)	Possible system board resource and/or system board hardware failure.	See "Troubleshooting IRQ Assignment Conflicts" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
A(green) B(green) C(yellow) D(yellow)	Possible expansion card failure.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
A(green) B(green) C(green) D(yellow)	Other failure.	Ensure that the diskette drive, optical drive, and hard drives are properly connected. See "Troubleshooting Your System" for the appropriate drive installed in your system. If the problem persists, see "Getting Help."
A(green) B(green) C(green) D(green)	The system is in a normal operating condition after POST.	Information only.

○ = yellow
● = green
○ = off

System Beep Codes

If an error that cannot be reported on the screen occurs during POST, the system may emit a series of beeps that identifies the problem.

NOTE: If the system boots without a keyboard, mouse, or monitor attached, the system does not issue beep codes related to those peripherals.

If a beep code is emitted, write down the series of beeps and then look it up in Table 2-5. If you are unable to resolve the problem by looking up the meaning of the beep code, use system diagnostics to identify the possible cause. If you are still unable to resolve the problem, see "Getting Help."

Table 2-5. System Beep Codes

Code	Cause	Corrective Action
1-1-2	CPU register test failure	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."
1-1-3	CMOS write/read failure; faulty system board	Faulty system board. See "Getting Help."
1-1-4	BIOS error	Reflash the BIOS.
1-2-1	Programmable interval-timer failure; faulty system board	Faulty system board. See "Getting Help."
1-2-2	DMA initialization failure	See "Troubleshooting System Memory" in "Troubleshooting Your System."
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	
1-3-2	No memory installed	
1-3-3	Chip or data line failure in the first 64 KB of main memory	
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	
1-4-3	Fail-safe timer test failure	
1-4-4	Software NMI port test failure	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	Faulty system board. See "Getting Help."
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-2	Interrupt vector loading failure	
3-2-4	Keyboard-controller test failure	
3-3-1	CMOS failure	
3-3-2	System configuration check failure	
3-3-3	Keyboard controller not detected	
3-3-4	Video memory test failure	
3-4-1	Screen initialization failure	
3-4-2	Screen-retrace test failure	
3-4-3	Video ROM search failure	
4-2-1	No timer tick	Faulty system board. See "Getting Help."
4-2-2	Shutdown test failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
4-3-1	Improperly installed or faulty memory modules	See "Troubleshooting System Memory" in "Troubleshooting Your System."
4-3-2	No memory modules installed in the first memory module connector	Install a memory module in the first memory module connector. See "System Memory" in "Installing System Components."
4-3-3	Faulty system board	Faulty system board. See "Getting Help."
4-3-4	Time-of-day clock stopped	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
4-4-1	Super I/O chip failure; faulty system board	Faulty system board. See "Getting Help."
4-4-4	Cache test failure; faulty processor	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."

Warning Messages

A warning message alerts you to a possible problem and prompts you to respond before the system continues a task. For example, before you format a diskette, a message will warn you that you may lose all data on the diskette. Warning messages usually interrupt the task and require you to respond by typing y (yes) or n (no).

NOTE: Warning messages are generated by either the application or the operating system. For more information, see the documentation that accompanied the operating system or application.

Diagnostics Messages

When you run system diagnostics, an error message may result. Diagnostic error messages are not covered in this section. Record the message on a copy of the Diagnostics Checklist in "Getting Help," and then follow the instructions in that section for obtaining technical assistance.

Alert Messages

Systems management software generates alert messages for your system. Alert messages include information, status, warning, and failure messages for drive, temperature, fan, and power conditions. For more information, see the systems management software documentation.

Baseboard Management Controller Messages

The Baseboard Management Controller (BMC) enables you to configure, monitor, and recover systems remotely. BMC uses the system's serial port and integrated NIC1 to support fault logging and SNMP alerting.

NOTE: If the integrated network controller is used in an Ether Channel team or link aggregation team, the BMC management traffic will not function properly. For more information about network teaming, see the documentation for the network controller.

For additional information on using BMC, see the documentation for the BMC and systems management applications.

Running the System Diagnostics

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- ● Using Server Administrator Diagnostics
- ● System Diagnostics Features
- ● When to Use the System Diagnostics
- ● Running the System Diagnostics
- ● System Diagnostics Testing Options
- ● Using the Custom Test Options

If you experience a problem with your system, run the diagnostics before calling for technical assistance. The purpose of the diagnostics is to test your system's hardware without requiring additional equipment or risking data loss. If you are unable to fix the problem yourself, service and support personnel can use diagnostics test results to help you solve the problem.

Using Server Administrator Diagnostics

To assess a system problem, first use the online Server Administrator diagnostics. If you are unable to identify the problem, then use the system diagnostics.

To access the online diagnostics, log into the Server Administrator home page, and then click the **Diagnostics** tab. For information about using diagnostics, see the online help. For additional information, see the *Server Administrator User's Guide.*

System Diagnostics Features

The system diagnostics provides a series of menus and options for particular device groups or devices. The system diagnostics menus and options allow you to:

- l   Run tests individually or collectively.
- l   Control the sequence of tests.
- l   Repeat tests.
- l   Display, print, or save test results.
- l   Temporarily suspend testing if an error is detected or terminate testing when a user-defined error limit is reached.
- l   View help messages that briefly describe each test and its parameters.
- l   View status messages that inform you if tests are completed successfully.
- l   View error messages that inform you of problems encountered during testing.

When to Use the System Diagnostics

If a major component or device in the system does not operate properly, component failure may be indicated. As long as the microprocessor and the system's input/output devices (monitor, keyboard, and diskette drive) are functioning, you can use the system diagnostics to help identify the problem.

Running the System Diagnostics

The system diagnostics is run from the utility partition on your hard drive.

NOTICE: Use the system diagnostics to test only your system. Using this program with other systems may cause invalid results or error messages. In addition, use only the program that came with your system (or an updated version of that program).

1.   As the system boots, press <F10> during POST.

2.   From the utility partition main menu, select **Run System Diagnostics**, or select **Run Memory Diagnostics** if you are troubleshooting memory.

When you start the system diagnostics, a message is displayed stating that the diagnostics are initializing. Next, the **Diagnostics** menu appears. The menu allows you to run all or specific diagnostics tests or to exit the system diagnostics.

NOTE: Before you read the rest of this section, start the system diagnostics so that you can see the utility on your screen.

System Diagnostics Testing Options

Click the testing option in the **Main Menu** window. Table 3-1 provides a brief explanation of testing options.

Table 3-1. System Diagnostics Testing Options

Testing Option	Function
Express Test	Performs a quick check of the system. This option runs device tests that do not require user interaction. Use this option to quickly identify the source of your problem.
Extended Test	Performs a more thorough check of the system. This test can take an hour or longer.
Custom Test	Tests a particular device.
Information	Displays test results.

Using the Custom Test Options

When you select **Custom Test** in the **Main Menu** window, the **Customize** window appears and allows you to select the device(s) to be tested, select specific options for testing, and view the test results.

Selecting Devices for Testing

The left side of the **Customize** window lists devices that can be tested. Devices are grouped by device type or by module, depending on the option you select. Click the **(+)** next to a device or module to view its components. Click **(+)** on any component to view the tests that are available. Clicking a device, rather than its components, selects all of the components of the device for testing.

Selecting Diagnostics Options

Use the **Diagnostics Options** area to select how you want to test a device. You can set the following options:

- l **Non-Interactive Tests Only** — When checked, runs only tests that require no user intervention.

- l **Quick Tests Only** — When checked, runs only the quick tests on the device. Extended tests will not run when you select this option.

- l **Show Ending Timestamp** — When checked, time stamps the test log.

- l **Test Iterations** — Selects the number of times the test is run.

- l **Log output file pathname** — When checked, enables you to specify where the test log file is saved.

Viewing Information and Results

The tabs in the **Customize** window provide information about the test and the test results. The following tabs are available:

- l **Results** — Displays the test that ran and the result.

- l **Errors** — Displays any errors that occurred during the test.

- l **Help** — Displays information about the currently selected device, component, or test.

- l **Configuration** — Displays basic configuration information about the currently selected device.

- l **Parameters** — If applicable, displays parameters that you can set for the test.

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Troubleshooting Your System

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

Safety First—For You and Your System

To perform certain procedures in this document, you must remove the system cover and work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in your system documentation.

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

Start-Up Routine

Look and listen during the system's start-up routine for the indications described in Table 4-1.

Table 4-1. Start-Up Routine Indications

Look/listen for:	Action
An error message displayed on the monitor.	See "System Messages" in "Indicators, Messages, and Codes."
A series of beeps emitted by the system.	See "System Beep Codes" in "Indicators, Messages, and Codes."
Alert messages from the systems management software.	See the systems management software documentation.
The monitor's power indicator.	See "Troubleshooting the Video Subsystem."
The keyboard indicators.	See "Troubleshooting the Keyboard."
The USB diskette drive activity indicator.	See "Troubleshooting a USB Device."
The USB CD drive activity indicator.	See "Troubleshooting a USB Device."
The optical drive activity indicator.	See "Troubleshooting an Optical Drive."
The hard-drive activity indicator.	See "Troubleshooting SCSI Hard Drives."
An unfamiliar constant scraping or grinding sound when you access a drive.	See "Getting Help."

Checking the Equipment

This section provides troubleshooting procedures for external devices attached to the system, such as the monitor, keyboard, or mouse. Before you perform any of the procedures, see "Troubleshooting External Connections."

Troubleshooting IRQ Assignment Conflicts

Most PCI devices can share an IRQ with another device, but they cannot use an IRQ simultaneously. To avoid this type of conflict, see the documentation for

each PCI device for specific IRQ requirements. <u>Table 4-2</u> lists the IRQ assignments.

Table 4-2. IRQ Assignment Defaults

IRQ Line	Assignment
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	*Available*
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	*Available*
IRQ6	*Available*
IRQ7	*Available*
IRQ8	Real-time clock
IRQ9	ACPI functions (used for power management)
IRQ10	*Available*
IRQ11	*Available*
IRQ12	PS/2 mouse port (available if the mouse is disabled through the System Setup program)
IRQ13	Math coprocessor
IRQ14	IDE optical drive controller (available if IDE CDROM controller is disabled through the System Setup program)
IRQ15	Reserved (available if IDE CDROM controller is disabled through the System Setup program)

Troubleshooting External Connections

Loose or improperly connected cables are the most likely source of problems for the system, monitor, and other peripherals (such as a printer, keyboard, mouse, or other external device). Ensure that all external cables are securely attached to the external connectors on your system. See <u>Figure B-1</u> for the front-panel connectors and <u>Figure B-2</u> for the back-panel connectors on your system.

Troubleshooting the Video Subsystem

Problem

- l   Monitor is not working properly.

- l   Video memory is faulty.

Action

1.   Check the system and power connections to the monitor.

2.   Determine whether the system has monitors attached to both the front and rear video connectors.

     The system supports only one monitor attached to either the front or rear video connector. When a monitor is connected to the front panel, the back-panel video, and PS/2 keyboard and mouse connectors are disabled.

     If two monitors are attached to the system, disconnect one monitor. If the problem is not resolved, continue to the next step.

3.   Check the system and power connections to the monitor.

4.   Run the appropriate online diagnostic test. See "<u>Using Server Administrator Diagnostics</u>" in "Running System Diagnostics."

     If the tests run successfully, the problem is not related to video hardware.

     If the tests fail, see "<u>Getting Help</u>."

Troubleshooting the Keyboard

Problem

- l   System message indicates a problem with the keyboard.

l   Keyboard is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Press each key on the keyboard, and examine the keyboard and its cable for signs of damage.

3. Swap the faulty keyboard with a working keyboard.

    If the problem is resolved, replace the faulty keyboard. See "Getting Help."

    If the problem is not resolved, see "Getting Help."

Troubleshooting the Mouse

Problem

l   System message indicates a problem with the mouse.
l   Mouse is not functioning properly.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

    If the test fails, continue to the next step.

2. Examine the mouse and its cable for signs of damage.

3. Swap the faulty mouse with a working mouse.

    If the problem is resolved, replace the faulty mouse. See "Getting Help."

    If the problem is not resolved, see "Getting Help."

Troubleshooting Basic I/O Functions

Problem

l   Error message indicates a problem with a serial port.
l   Device connected to a serial port is not operating properly.

Action

1. Enter the System Setup program and ensure that the serial port is enabled. See "Using the System Setup Program" in the *User's Guide*.

2. If the problem is confined to a particular application, see the application documentation for specific port configuration requirements that the program may require.

3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

    If the tests run successfully but the problem persists, see "Troubleshooting a Serial I/O Device."

Troubleshooting a Serial I/O Device

Problem

l   Device connected to the serial port is not operating properly.

Action

1. Turn off the system and any peripheral devices connected to the serial port.

2. Swap the serial interface cable with a working cable, and turn on the system and the serial device.

    If the problem is resolved, replace the interface cable. See "Getting Help."

3. Turn off the system and the serial device, and swap the device with a comparable device.

4. Turn on the system and the serial device.

    If the problem is resolved, replace the serial device. See "Getting Help."

    If the problem persists, see "Getting Help."

Troubleshooting a USB Device

Problem

l   System message indicates a problem with a USB device.
l   Device connected to a USB port is not operating properly.

Action

1. Enter the System Setup program, and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide*.

2. Turn off the system and any USB devices.

3. Disconnect the USB devices, and connect the malfunctioning device to the other USB connector.

4. Turn on the system and the reconnected device.

    If the problem is resolved, the USB connector might be defective. See "Getting Help."

5. If possible, swap the interface cable with a working cable.

    If the problem is resolved, replace the interface cable. See "Getting Help."

6. Turn off the system and the USB device, and swap the device with a comparable device.

7. Turn on the system and the USB device.

    If the problem is resolved, replace the USB device. See "Getting Help."

    If the problem persists, see "Getting Help."

Troubleshooting a NIC

Problem

l   NIC cannot communicate with network.

Action

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Check the appropriate indicator on the NIC connector. See "<u>NIC Indicators</u>" in "Indicators, Messages, and Codes."

   l If the link indicator does not light, check all cable connections.

   l If the activity indicator does not light, the network driver files might be damaged or missing.

      Remove and reinstall the drivers if applicable. See the NIC's documentation.

   l Change the autonegotiation setting, if possible.

   l Use another connector on the switch or hub.

   If you are using a NIC card instead of an integrated NIC, see the documentation for the NIC card.

3. Ensure that the appropriate drivers are installed and the protocols are bound. See the NIC's documentation.

4. Enter the System Setup program and confirm that the NICs are enabled. See "Using the System Setup Program" in your *User's Guide*.

5. Ensure that the NICs, hubs, and switches on the network are all set to the same data transmission speed. See the network equipment documentation.

6. Ensure that all network cables are of the proper type and do not exceed the maximum length. See "Network Cable Requirements" in "I/O Connectors."

Responding to a Systems Management Software Alert Message

Systems management software monitors critical system voltages and temperatures, fans, and hard drives in the system. Alert messages appear in the **Alert Log** window. For information about the **Alert Log** window, see the systems management software documentation.

Inside the System

In <u>Figure 4-1</u>, the bezel and system cover are removed to provide an interior view of the system.

Figure 4-1. Inside the System
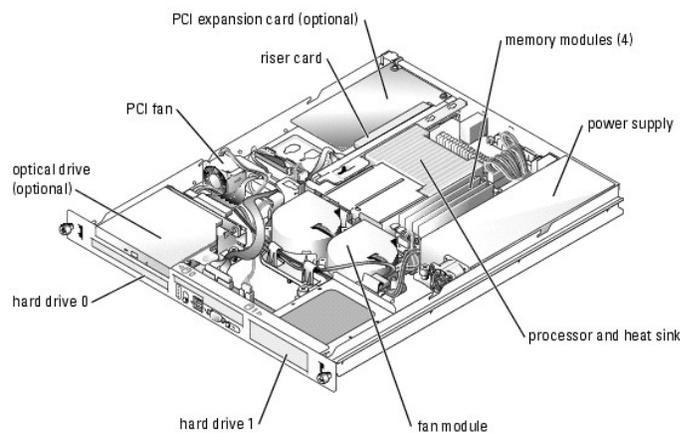
The system board holds the system's control circuitry and other electronic components. The processor and memory are installed directly on the system board. Using a riser card, the system can accommodate two expansion cards. The peripheral bays provide space for up to two hard drives and an optional optical drive. Power is supplied to the system board and drives through one nonredundant power supply.

Opening the System

The system is enclosed by an optional bezel and cover. To upgrade or troubleshoot the system, remove the bezel and cover.

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. If applicable, remove the bezel. See <u>Figure 4-2</u>.

   a. Unlock the bezel.

   b. Unlatch the left end of the bezel and rotate it away from the front panel.

c. Unhook the right end of the bezel and pull the bezel away from the system.

Figure 4-2. Installing and Removing the Optional Bezel
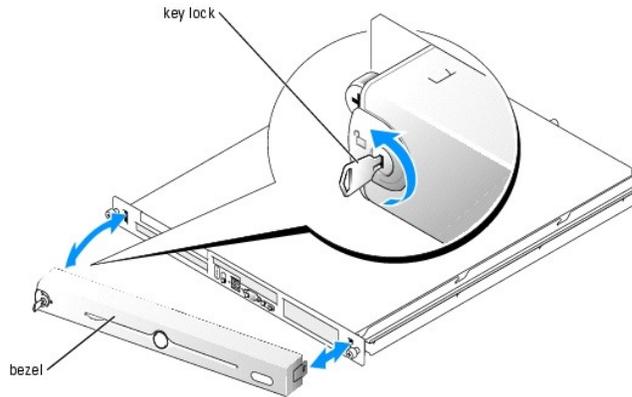
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet and peripherals.

3. Remove the system from the rack and place it on a work surface.

4. To remove the system cover, loosen the thumbscrew at the back of the system. See Figure 4-3.

5. Slide the cover backward about 1.3 cm (0.5 inch), and grasp the cover on both sides.

6. Carefully lift the cover away from the system.

Figure 4-3. Installing and Removing the System Cover
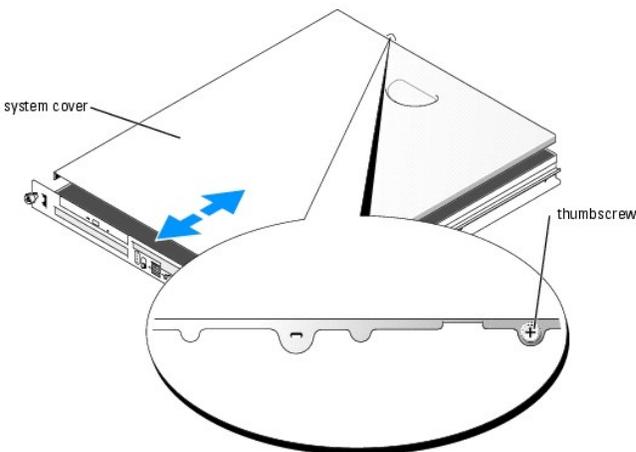
Closing the System

1. Ensure that you did not leave tools or parts inside the system.

2. Place the cover over the sides of the chassis, and slide the cover forward.

3. Tighten the thumbscrew at the back of the system to secure the cover. See Figure 4-3.

4. Replace the system in the rack, and reconnect the peripheral cables.

5. To replace the optional bezel, hook the right end of the bezel onto the chassis, then fit the bezel onto the system. Secure the bezel with the keylock. See Figure 4-2.

6. Reconnect the system to the electrical outlet, and turn on the system.

Troubleshooting a Wet System

Problem

- Liquid spilled on the system.
- Excessive humidity.

Action

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

2. Open the system. See "Opening the System."

3. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."

4. Let the system dry thoroughly for at least 24 hours.

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the system does not start properly, see "Getting Help."

7. If the system starts properly, shut down the system and reinstall all of the expansion cards that you removed. See "Installing an Expansion Card" in "Installing System Components."

8. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

   If the tests fail, see "Getting Help."

Troubleshooting a Damaged System

Problem

- System was dropped or damaged.

Action

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System."

2. Ensure that the following components are properly installed:
   - Expansion cards
   - Power supplies
   - Fans

3. Ensure that all cables are properly connected.

4. Close the system. See "Closing the System."

5. Run the system board tests in the system diagnostics. See "Running the System Diagnostics."

   If the tests fail, see "Getting Help."

Troubleshooting the System Battery

Problem

- l System message indicates a problem with the battery.

- l System Setup program loses system configuration information.

- l System date and time do not remain current.

📝 **NOTE:** 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 caused by a defective battery.

Action

1. Re-enter the time and date through the System Setup program. See "Using the System Setup Program" in your *User's Guide*.

2. Turn off the system and disconnect it from the electrical outlet for at least one hour.

3. Reconnect the system to the electrical outlet and turn on the system.

4. Enter the System Setup program.

   If the date and time are not correct in the System Setup program, replace the battery. See "System Battery" in "Installing System Components."

   If the problem is not resolved by replacing the battery, see "Getting Help."

📝 **NOTE:** 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.

Troubleshooting the Power Supply

Problem

- l System-status indicators are amber.

Action

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostics test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that the power supply is properly installed by removing and reinstalling it. See "Power Supply" in "Installing System Components."

   If the problem persists, remove the faulty power supply. See "Removing the Power Supply" in "Installing System Components."

5. Install a new power supply. See "Installing the Power Supply" in "Installing System Components."

   If the problem persists, see "Getting Help."

Troubleshooting System Cooling Problems

Problem

l   Systems management software issues a fan-related error message.

Action

Ensure that none of the following conditions exist:

l   Ambient temperature is too high.

l   External airflow is obstructed.

l   Cables inside the system obstruct airflow.

l   An individual cooling fan has failed. See "Troubleshooting a Fan."

Troubleshooting a Fan

Problem

l   System-status indicator is amber.

l   Systems management software issues a fan-related error message.

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate diagnostic test. See "Using Server Administrator Diagnostics" in Running System Diagnostics."

2. Open the system. See "Opening the System."

3. Ensure that the faulty fan's power cable is firmly attached to the fan power connector. See "Fan Assembly" in "Installing System Components."

   ✍ **NOTE:** Wait 30 seconds for the system to recognize the fan and determine whether it is working properly.

4. If the problem is not resolved, install a new fan. See "Fan Assembly" in "Installing System Components."

   If the replacement fan is working properly, close the system. See "Closing the System."

   If the replacement fan does not operate, see "Getting Help."

Troubleshooting System Memory

Problem

l   Faulty memory module.

l   Faulty system board.

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

2. Turn on the system and attached peripherals.

   If an error messages does not appear, go to step 12.

3. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.

   If the amount of memory installed matches the system memory setting, go to step 12.

4. Remove the bezel. See Figure 4-2.

5. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

6. Open the system. See "Opening the System."

7. Ensure that the memory banks are populated correctly. See "Memory Module Installation Guidelines" in "Installing System Components."

   If the memory modules are populated correctly, continue to the next step.

8. Reseat the memory modules in their sockets. See "Installing Memory Modules" in "Installing System Components."

9. Close the system. See "Closing the System."

10. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

11. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.

    If the amount of memory installed does not match the system memory setting, then perform the following steps:

    a. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.

    b. Open the system. See "Opening the System."

    c. Swap the memory modules in bank 1 with another bank of the same capacity. See "Installing Memory Modules" in "Installing System Components."

    d. Close the system. See "Closing the System."

    e. Reconnect the system to its electrical outlet, and turn on the system and attached peripherals.

    f. As the system boots, observe the monitor screen and the indicators on the keyboard.

12. Perform the following steps:

    a. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.

    b. Open the system. See "Opening the System."

    c. Repeat step c through step f in step 11 for each memory module installed.

    If the problem persists, see "Getting Help."

Troubleshooting an Optical Drive

Problem

- System cannot read data from a CD or DVD.
- Optical drive indicator does not blink during boot.

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Try using a different CD or DVD that you know works properly.

2. Enter the System Setup program and ensure that the drive's IDE controller is enabled. See "Using the System Setup Program" in the *User's Guide*.

3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

4. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

5. Open the system. See "Opening the System."

6. Ensure that the interface cable is securely connected to the optical drive and to the controller.

7. Ensure that a power cable is properly connected to the drive.

8. Close the system. See "Closing the System."

9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem is not resolved, see "Getting Help."

Troubleshooting SCSI Hard Drives

Problem

- l   Device driver error.
- l   Hard drive not recognized by the system.

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

⊘ **NOTICE:** This procedure can destroy data stored on the hard drive. Before you continue, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

   For information about testing the controller, see the SCSI or RAID controller's documentation.

   If the tests fail, continue to the next step.

2. Restart the system and enter the SCSI configuration utility.

   ✍ **NOTE:** To enter the utility, press <Ctrl><a> or <Ctrl><m>, depending on the utility. See the documentation supplied with the controller for information about the configuration utility.

3. Ensure that the primary SCSI channel is enabled, and restart the system.

4. Ensure that the required device drivers are installed and configured correctly.

5. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

6. Open the system. See "Opening the System."

7. Ensure that the hard-drive interface cable is properly connected between the drive and the controller card. See the documentation supplied with the controller card.

8. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

9. Ensure that a power cable is properly connected to the drive.

10. Ensure that the hard drive is configured with a unique SCSI ID number and that the drive is terminated or not terminated as appropriate. See the documentation for the hard drive.

11. Close the system. See "Closing the System."

12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

    If the problem persists, continue to the next step.

13. Format and partition the hard drive. See the operating system documentation.

14. If possible, restore the files to the drive.

    If the problem persists, see "Getting Help."

Troubleshooting SATA Hard Drives

Troubleshooting a SATA Hard Drive

Problem

- l Faulty hard drive
- l Damaged or improperly connected hard-drive cables

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your Product Information Guide for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

⊘ **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

📝 **NOTE:** If the hard drive is used in a RAID configuration, see "Troubleshooting a SATA Hard Drive in a RAID Configuration."

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Enter the System Setup program and verify that the system is configured correctly. See "Using the System Setup Program" in your User's Guide.

3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

4. Open the system. See "Opening the System."

5. Ensure that the hard-drive interface cable is properly connected between the drive and the system board.

    To identify system board connectors, see Figure A-3.

6. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

7. Ensure that the power cable is properly connected to the drive.

8. Close the system. See "Closing the System."

9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

10. Format and partition the hard drive. See the operating system documentation.

11. If possible, restore the files to the drive.

    If the problem persists, see "Getting Help."

Troubleshooting a SATA Hard Drive in a RAID Configuration

Problem

- l Device driver error
- l Damaged or improperly connected hard-drive cables

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

🚫 **NOTICE:** This troubleshooting procedure can destroy data stored on the hard drive. Before you proceed, back up all files on the hard drive.

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Restart your system and enter the RAID configuration utility. See the RAID controller documentation.

3. Ensure that the required device drivers are installed and are configured correctly. See the RAID controller's documentation.

4. Remove the bezel. See Figure 4-2.

5. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

6. Open the system. See "Opening the System."

7. Ensure that the hard-drive interface cable is properly connected to the drive and to the controller card. See the documentation that accompanied the controller card.

8. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."

9. Ensure that the power cable is properly connected to the drive.

10. Close the system. See "Closing the System."

11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

    If the problem persists, see "Getting Help."

Troubleshooting a RAID Controller Card

📝 **NOTE:** When troubleshooting a RAID controller card, also see the documentation for your operating system and the RAID controller.

Problem

- Error message indicates a RAID controller problem.
- RAID controller performs incorrectly or not at all.

Action

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Remove the bezel. See Figure 4-2.

3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

4. Open the system. See "Opening the System."

5. Ensure that the controller card is firmly seated in its connector. See "Installing an Expansion Card" in "Installing System Components."

6. Ensure that the appropriate cables are firmly connected to their corresponding connectors on the controller card.

7. Close the system. See "Closing the System."

8. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

    If the problem persists, see the RAID controller's documentation for more information on troubleshooting.

Troubleshooting Expansion Cards

📝 **NOTE:** When troubleshooting an expansion card, see the documentation for your operating system and the expansion card.

Problem

- l Error message indicates a problem with an expansion card.
- l Expansion card performs incorrectly or not at all.

Action

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that each expansion card is firmly seated in its connector. See "Installing an Expansion Card" in "Installing System Components."

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, go to the next step.

7. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

8. Open the system. See "Opening the System."

9. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."

10. Close the system. See "Closing the System."

11. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

12. Run the appropriate online diagnostic test.

    If the tests fail, see "Getting Help."

13. For each expansion card you removed in step 9, perform the following steps:

    a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
    b. Open the system. See "Opening the System."
    c. Reinstall one of the expansion cards.
    d. Close the system. See "Closing the System."
    e. Run the appropriate diagnostic test.

       If the tests fail, see "Getting Help."

Troubleshooting the Microprocessor

Problem

- l Error message indicates a microprocessor problem.
- l A heat sink is not installed for the processor.

Action

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Run the appropriate online diagnostics test. See "Using Server Administrator Diagnostics" in "Running the System Diagnostics."

2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

3. Open the system. See "Opening the System."

4. Ensure that the processor and heat sink are properly installed. See "Replacing the Processor" in "Installing System Components."

5. Close the system. See "Closing the System."

6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the problem persists, see "Getting Help."

Installing System Components
Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Cooling Shroud
- System Battery
- Fan Assembly
- PCI Fan Module
- Power Supply
- Expansion Cards
- Riser Card
- System Memory
- Processor

This section describes how to install the following system components:

- Cooling shroud

- System battery

- Fan assembly

- Power supply

- Expansion cards

- Riser card

- System memory

- Processor

Cooling Shroud

The cooling shroud covers the processor and system battery. The shroud also directs air flow to the expansion cards and system memory.

Removing the Cooling Shroud

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. While grasping the cooling shroud, press the release latch and lift the shroud away from the fan assembly. See Figure 5-1.

3. Remove the cooling shroud.

Figure 5-1. Installing and Removing the Cooling Shroud
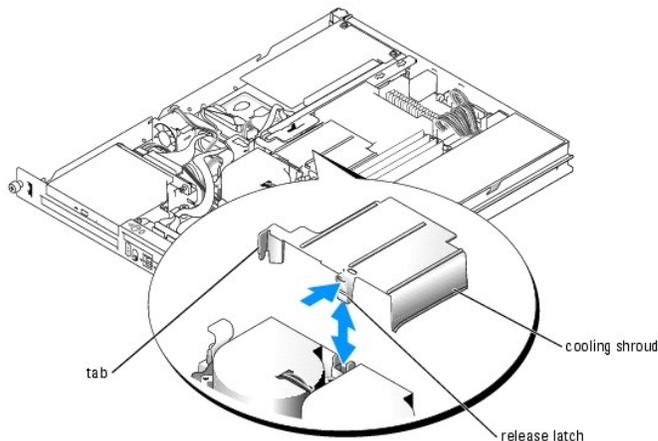
Installing the Cooling Shroud

1. Insert the tab on the side of the cooling shroud and the release latch into the fan assembly. See Figure 5-1.

2. Push the cooling shroud down until the release latch snaps into place, securing the shroud to the fan assembly.

3. Close the system. See "Closing the System" in "Troubleshooting Your System."

System Battery

Replacing the System Battery

> ⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

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*.

2. Open the system. See "Opening the System" in "Troubleshooting Your System."

3. Remove the cooling shroud. See "Removing the Cooling Shroud."

4. Remove the riser card. See "Removing the Riser Card."

5. Locate the battery on the system board. See Figure A-3 for the battery location.

6. Grasp the battery with your fingers and pull it out of the battery socket. See Figure 5-2.

7. Push the new battery into the battery socket as shown in Figure 5-2.

   > 📝 **NOTE:** The side of the battery labeled "+" must face toward the open side of the battery socket.

Figure 5-2. Replacing the Battery
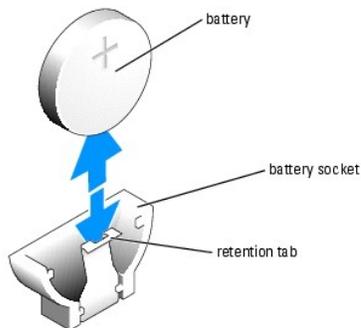
8. Reinstall the riser card. See "Installing the Riser Card."

9. Install the cooling shroud. See "Installing the Cooling Shroud."

10. Close the system. See "Closing the System" in "Troubleshooting Your System."

11. Enter the System Setup program to confirm that the battery operates properly.

12. From the main screen, select **System Time** to enter the correct time and date.

    Also, re-enter any system configuration information that is no longer displayed on the System Setup screens, and then exit the System Setup program.

13. To test the newly installed battery, see "Troubleshooting the System Battery" in "Troubleshooting Your System."

Fan Assembly

The fan assembly contains two fans and provides cooling for the processor and memory modules.

Removing the Fan Assembly

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Remove the cooling shroud. See "Removing the Cooling Shroud."

3. Disconnect the fan assembly's power cable from the system board. See Figure 5-3.

4. Disconnect the PCI fan cable from the fan assembly connector, if present.

5. Remove the data cable from hard drive 1 if installed. See Figure 5-3.

6. Pull the cables out of the fan assembly's cable tray. See Figure 5-3.

7. While pressing the two release levers on the fan assembly, lift the fan assembly off of the two securing posts and out of the chassis. See Figure 5-3.

Figure 5-3. Installing and Removing the Fan Assembly
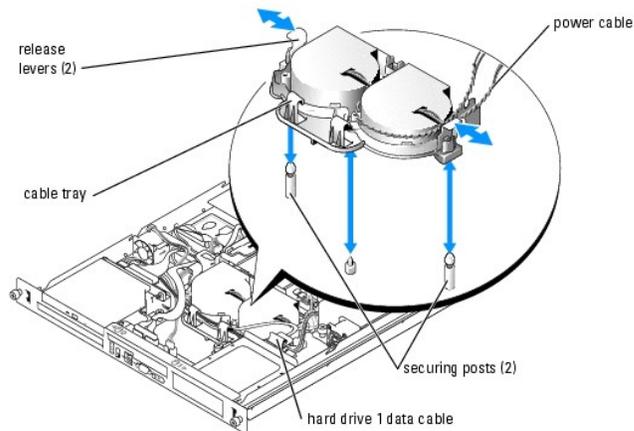
Installing the Fan Assembly

1. Align the holes in the fan assembly with the two fan assembly securing posts. See Figure 5-3.

2. Lower the fan assembly until the release levers snap onto the securing posts.

3. Route the cables in the fan assembly cable tray. See Figure 5-3.

4. Reconnect the hard drive 1 data cable to the hard drive. See Figure 5-3.

5. Reconnect the PCI fan cable to the fan assembly connector, if applicable.

6. Reconnect the fan assembly power cable to the system board.

7. Install the cooling shroud. See "Installing the Cooling Shroud."

8. Close the system. See "Closing the System" in "Troubleshooting Your System."

PCI Fan Module

The PCI fan module provides cooling for the expansion cards.

Removing the PCI Fan Module

⚠ **CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect the fan module's power cable. Depending on your system, this connector may be on the fan assembly cable or the daughter card.

3. Gently pull the fan module up and away from the alignment pin on the chassis, and remove the fan module from the system. See Figure 5-4.

Figure 5-4. Installing and Removing the PCI Fan Module
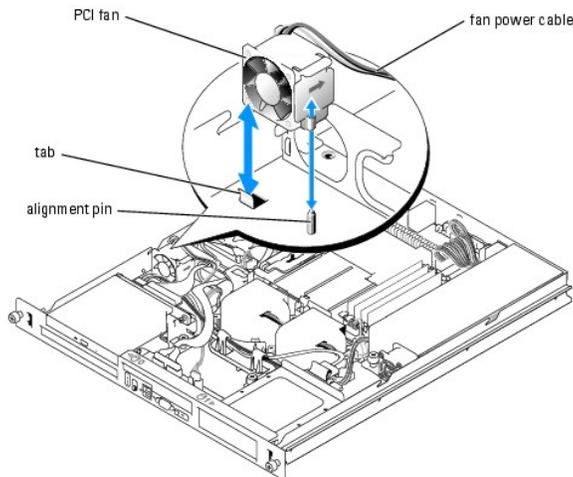
Installing the PCI Fan Module

1. With the fan power cable facing towards the rear of the system, align the fan module alignment hole with the alignment pin on the chassis. See Figure 5-4.

2. Install the PCI fan module against the tab and atop the alignment pin on the system chassis.

3. Reconnect the fan module's power cable to the connector on the fan assembly or daughter card.

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Power Supply

The system supports a single nonredundant power supply.

Removing the Power Supply

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect the following power supply cables:

    a. P3 from the hard drive cable harness

    b. P2 from system board connector 12V

    c. P1 from system board connector PWR_CONN

3. Using a #2 Phillips screwdriver, remove the screw at the front of the power supply that secures the power supply to the chassis. See Figure 5-5.

4. Slide the power supply forward and lift straight up to remove the power supply from the chassis.

Figure 5-5. Installing and Removing the Power Supply
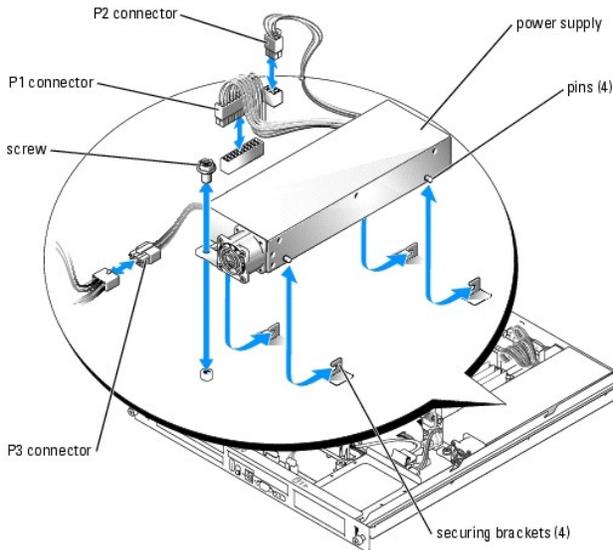
Installing the Power Supply

1. Lower the power supply into the chassis and slide it backward until the four pins on the power supply are engaged into the securing brackets.

2. Using a #2 Phillips screwdriver, install the screw at the front of the power supply that secures the power supply to the chassis.

3. Connect the following power supply cables:

    a. P3 to the hard drive cable harness

    b. P2 to the system board connector 12V

    c. P1 to the system board connector PWR_CONN

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Expansion Cards

The system is available with an optional PCIe riser card or PCI-X/PCIe riser card. The PCIe riser card provides one PCIe x4-lane expansion slot and one PCIe x8-lane expansion slot, and the PCI-X/PCIe riser card provides one PCI-X expansion slot and one PCIe x8-lane expansion slot. If you are installing a remote access controller card, it must be installed in the upper slot of a PCI-X/PCIe riser card. See "Riser Card Connectors" in "Jumpers, Switches, and Connectors" for the locations of the expansion-card slots on the two types of riser cards.

Installing an Expansion Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Remove the expansion-card retainer adjacent to the expansion card slots. See Figure 5-6.

3. Remove the filler bracket on the slot you will be using.

   ✍ **NOTE:** Keep this bracket if you need to remove the expansion card. Filler brackets must be installed over empty expansion card slots 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.

4. Insert the expansion card firmly into the expansion-card connector on the riser card until the card is fully seated.

   ✍ **NOTE:** Ensure that the expansion-card bracket is also inserted into the securing slot on the chassis's back panel.

5. Replace the expansion-card retainer. See Figure 5-6.

6. Connect any internal or external cable(s) to the expansion card.

   ✍ **NOTE:** You may need to remove the riser card in order to install certain expansion cards with internal connectors. See "Riser Card."

7. Close the system. See "Closing the System" in "Troubleshooting Your System."

Figure 5-6. Installing and Removing Expansion Cards
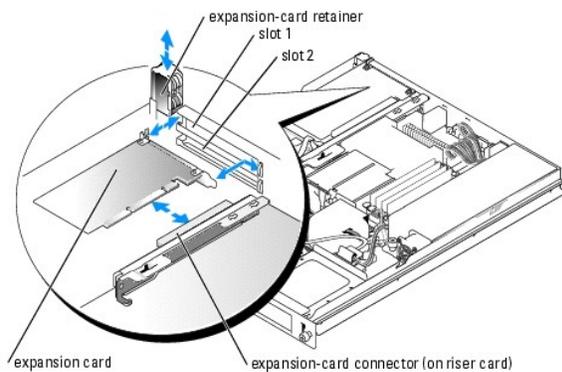

Removing an Expansion Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect any internal or external cable(s) that are connected to the expansion card.

3. Lift the expansion-card retainer adjacent to the PCI slots. See Figure 5-6.

4. Grasp the expansion card and carefully pull it away from the expansion-card connector.

   If you are removing a SCSI controller card, disconnect the cables from the card that connects to the SCSI hard drives.

5. If you are permanently removing the card, replace the metal filler bracket over the empty card-slot opening.

   ✍ **NOTE:** Filler brackets must be installed over empty expansion-card slots to maintain 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.

6. Replace the expansion-card retainer.

7. Close the system. See "Closing the System" in "Troubleshooting Your System."

Riser Card

The riser card provides two expansion-card slots. See "Expansion Cards" for detailed information on the expansion-card slots.

Removing the Riser Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Remove any expansion card(s). See "Removing an Expansion Card."

3. Using a #2 Phillips screwdriver, remove the two screws that secure the riser card to the chassis. See Figure 5-7.

4. Lift the riser card straight up and remove the riser card from the system.

Figure 5-7. Installing and Removing the Riser Card
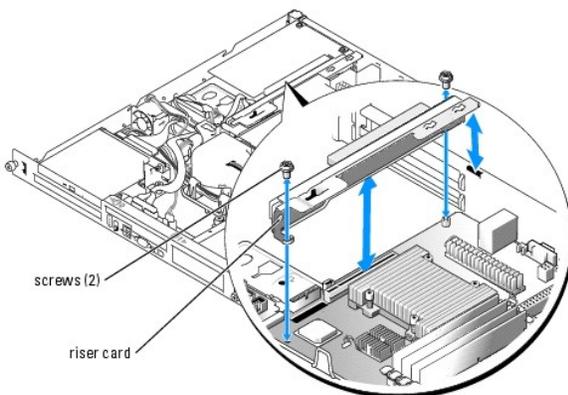
Installing the Riser Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Insert the riser card firmly into the riser card connector on the system board until the riser card is fully seated.

2. Using a #2 Phillips screwdriver, install the two screws that secure the riser card to the system board.

3. Install any expansion card(s). See "Installing an Expansion Card."

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

System Memory

The four memory module sockets are located on the system board adjacent to the power supply and can accommodate 256 MB to 8 GB of unbuffered ECC PC-3200 (DDR2 533) memory. See Figure A-3 for the location of the memory module sockets.

You can upgrade the system memory by installing combinations of 256-MB, 512-MB, 1-GB, and 2-GB unbuffered memory modules. If you receive an error

message stating that maximum memory has been exceeded, see "Indicators, Messages, and Codes" for more information. You can purchase memory upgrade kits from Dell.

NOTE: The memory modules must be PC-3200 compliant.

Memory Module Installation Guidelines

The memory module sockets are arranged in banks (1 and 2) on two channels (A and B). The memory module banks must be installed in identical pairs.

The memory module banks are identified as follows:

Bank 1: DIMM1_A and DIMM1_B

Bank 2: DIMM2_A and DIMM2_B

For example, if socket DIMM1_A contains a 256-MB memory module, then socket DIMM1_B must contain a 256-MB memory module.

Table 5-1 shows examples of different memory configurations, based on the following guidelines:

- ι If only one memory module is installed, it must be installed in the DIMM1_A socket.
- ι A bank must contain identical memory modules.
- ι Install the memory modules in bank 1 (DIMM1_*x*) before installing memory modules in bank 2 (DIMM2_*x*).
- ι Installing three memory modules is not supported.

Table 5-1. Sample Memory Module Configurations

Total Memory	DIMM1_A	DIMM2_A	DIMM1_B	DIMM2_B
256 MB	256 MB	None	None	None
512 MB	256 MB	None	256 MB	None
512 MB	512 MB	None	None	None
1 GB	256 MB	256 MB	256 MB	256 MB
1 GB	512 MB	None	512 MB	None
1.5 GB	512 MB	256 MB	512 MB	256 MB
2 GB	512 MB	512 MB	512 MB	512 MB
2 GB	1 GB	None	1 GB	None
3 GB	1 GB	512 MB	1 GB	512 MB
4 GB	1 GB	1 GB	1 GB	1 GB
4 GB	2 GB	None	2 GB	None
5 GB	2 GB	512 MB	2 GB	512 MB
6 GB	2 GB	1 GB	2 GB	1 GB
8 GB	2 GB	2 GB	2 GB	2 GB

Installing Memory Modules

CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Locate the memory module sockets. See Figure A-3.

3. Press the ejectors on the memory module socket down and out, as shown in Figure 5-8, to allow the memory module to be inserted into the socket.

4. Align the memory module's edge connector with the alignment keys of the memory module socket, and insert the memory module in the socket.

   NOTE: The memory module socket has two alignment keys that allow you to install the memory module in the socket in only one way.

5. Press down on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the memory module into the socket.

   When the memory module is properly seated in the socket, the ejectors on the memory module socket align with the ejectors on the other sockets that have memory modules installed.

6. Repeat step 2 through step 5 of this procedure to install the remaining memory modules. See Table 5-1 for valid memory configurations.

7. Close the system. See "Closing the System" in "Troubleshooting Your System."

8. (Optional) Press <F2> to enter the System Setup program, and check the **System Memory** setting on the main **System Setup** screen.

    The system should have already changed the value to reflect the newly installed memory.

9. If the value is incorrect, one or more of the memory modules may not be installed properly. Repeat step 1 through step 8 of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.

10. Run the system memory test in the system diagnostics. See "Running the System Diagnostics."

Figure 5-8. Installing and Removing a Memory Module
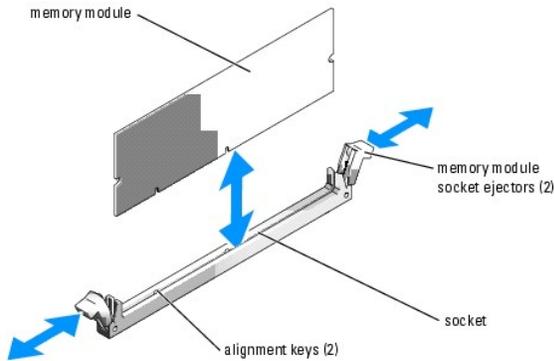
Removing Memory Modules

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Locate the memory module sockets. See Figure A-3.

3. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket. See Figure 5-8.

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Processor

You can upgrade the processor to take advantage of future options in speed and functionality. The processor and its associated internal cache memory are contained in a pin grid array (PGA) package that is installed in a ZIF socket on the system board.

Replacing the Processor

⚠️ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

⬛ **NOTICE:** Never remove the heat sink from a processor unless you intend to remove the processor. The heat sink is necessary to maintain proper thermal conditions.

✏️ **NOTE:** When you remove the heat sink, the possibility exists that the processor might adhere to the heat sink and be removed from the socket. It is recommended that you remove the heat sink while the processor is still warm.

2. Remove the cooling shroud. See "Removing the Cooling Shroud."

3. Using a #2 Phillips screwdriver, loosen the four captive screws that secure the heat sink to the system board. See Figure 5-9.

Figure 5-9. Installing and Removing the Heat Sink
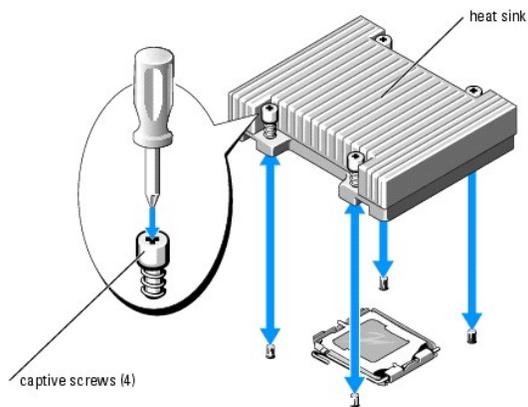
4. Wait 30 seconds for the heat sink to loosen from the processor.

5. If the heat sink has not separated from the processor, carefully rotate the heat sink in a clockwise, then counterclockwise, direction until it releases from the processor. Do not pry the heat sink off of the processor.

6. Lift the heat sink off of the processor and set the heat sink upside down so as not to contaminate the thermal grease.

7. Press down on the processor socket release lever, then pull the release lever upward to the fully open position. See Figure 5-10.

8. Open the processor cover. See Figure 5-10.

9. Lift the processor vertically out of the socket. Leave the processor cover and release lever in the open position so that the socket is ready for the new processor. See Figure 5-10.

Figure 5-10. Installing and Removing the Processor
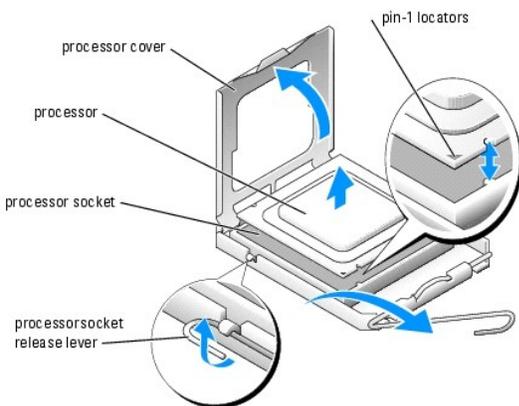
10. Unpack the new processor and heat sink.

11. Ensure that the processor socket release lever is in the fully open position.

12. Align the pin 1 corners of the processor and socket. See Figure 5-10.

⊘ **NOTICE:** You must position the processor correctly in the socket to avoid damaging the processor and the system board when you turn on the system. Be careful not to touch or bend the pins on the socket.

13. Set the processor lightly in the socket and ensure that the processor is level in the socket. When the processor is positioned correctly, press it gently to seat it in the socket.

14. Close the processor cover.

15. Rotate the release lever back down until it snaps into place, securing the processor cover.

16. Install the heat sink.

    a. Using a clean lint-free cloth, remove the existing thermal grease from the heat sink.

    NOTE: Use the heat sink that you removed earlier in this procedure.

    b. Apply thermal grease evenly to the top of the processor.

    c. Place the heat sink onto the processor. See Figure 5-9.

    d. Using a #2 Phillips screwdriver, tighten in a diagonal pattern the four captive screws that secure the heat sink to the system board. See Figure 5-9.

17. Install the cooling shroud. See "Installing the Cooling Shroud."

18. Close the system. See "Closing the System" in "Troubleshooting Your System."

    As the system boots, it detects the presence of the new processor and automatically changes the system configuration information in the System Setup program.

19. Press <F2> to enter the System Setup program, and check that the processor information matches the new system configuration.

    See your *User's Guide* for instructions about using the System Setup program.

20. Run the system diagnostics to verify that the new processor operates correctly.

    See "Running the System Diagnostics" for information about running the diagnostics and troubleshooting processor problems.

Back to Contents Page

Installing Drives

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Optical Drive
- SCSI Configuration Information
- Configuring the Boot Drive
- Hard Drives
- Installing a SCSI Controller Card

Your system contains up to two SATA or SCSI hard drives and an optional optical drive. If your system contains SCSI hard drives, they must be connected to a optional SCSI controller card. The integrated SATA controller supports up to two SATA hard drives.

Optical Drive

The optional optical drive is mounted in a bracket using two alignment pins and a spring clip on top of hard drive 0. An interposer card is connected to the back of the drive which allows the drive to be connected to the Pri-IDE connector on the system board.

Removing the Optical Drive

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect the power and interface cables from the optical drive's interposer card.

3. Pull the two captive fasteners that secure the interposer card to the hard drive 0 carrier. See Figure 6-1.

4. Disconnect the interposer card from the optical drive.

5. Press the bracket release lever that secures the optical drive to the hard drive 0 carrier. See Figure 6-1.

6. Lift and tilt the optical drive up and out of the bracket as shown in Figure 6-1.

Figure 6-1. Removing and Installing the Optional Optical Drive
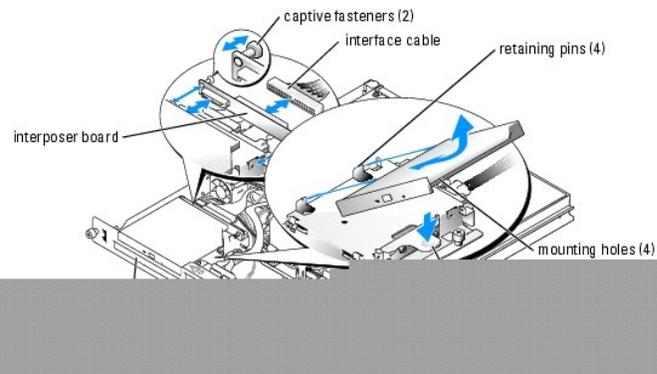
Installing the Optical Drive

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Align the optical drive's mounting holes with the retaining pins on the hard drive 0 bracket. See Figure 6-1.

2. Rotate the drive downward until it snaps into place.

3. Connect the interposer card to the optical drive.

   Push the plungers into the captive fastener barrels until they snap into place.

4. Connect the interface and power cables to the optical drive's interposer card.

5. Close the system. See "Closing the System" in "Troubleshooting Your System."

SCSI Configuration Information

Although SCSI drives are installed in essentially the same way as other drives, their configuration requirements are different. To install and configure a SCSI drive, follow the guidelines in the following subsections.

SCSI Interface Cables

SCSI interface connectors are keyed for correct insertion. Keying ensures that the pin-1 wire in the cable connects to pin 1 in the connectors on both ends. When you disconnect an interface cable, take care to grasp the cable connector, rather than the cable itself, to avoid stress on the cable.

SCSI ID Numbers

Each drive attached to a SCSI controller must have a unique SCSI ID number from 0 to 15.

   l The SCSI hard drive from which the system boots is configured as SCSI ID 0.

   l If you install optional SCSI drives or change your SCSI configuration, see the documentation for each SCSI drive for information on setting the appropriate SCSI ID number.

   NOTE: There is no requirement that SCSI ID numbers be assigned sequentially or that drives be attached to the cable in order by ID number.

Device Termination

SCSI logic requires that termination be enabled for the two drives at opposite ends of the SCSI chain and disabled for all drives in between. For internal SCSI drives, termination is configured automatically. See the documentation provided with any optional SCSI drive you purchase for information on disabling termination.

Configuring the Boot Drive

The drive or device from which the system boots is determined by the boot order specified in the System Setup program. See "Using the System Setup Program" in your *User's Guide*. To boot the system from a hard drive or drive array, the drive(s) must be connected to the appropriate controller:

   l To boot from a single SATA hard drive, the master drive (drive 0) must be connected to the SATA_PORT_0 connector on the daughter card. To identify daughter card connectors, see Figure A-3.

   l To boot from a single SCSI hard drive, the drive must be connected to the SCSI controller card. See the documentation that accompanied the controller card.

   l To boot from a SCSI RAID array, the drive must be connected to the RAID controller card. See the documentation that accompanied the controller card.

Hard Drives

Your system contains up to two non-hot-pluggable SATA or SCSI hard drives. If your system contains SCSI hard drives, they must be connected to a SCSI controller card. The cables for hard drive 1 are routed through a cable clamp mounted to the chassis.

Removing a Hard Drive

The procedures for removing and installing SATA or SCSI hard drives are the same.

   CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. If applicable, remove the optical drive.

   Remove the optical drive if you are removing hard drive 0. See "Removing the Optical Drive."

3. Disconnect the power and interface cables from the hard drive.

   The interface cables for SATA hard drives are connected to the daughter card. See Figure A-3 for the location of the daughter card connectors.

   The interface cables for SCSI hard drives are connected to a controller card.

4. Loosen the captive screw that secures the hard-drive carrier to the chassis. See Figure 6-2.

5. Slide the hard-drive carrier backward and lift the carrier out of the chassis.

Figure 6-2. Removing the Hard-Drive Carrier
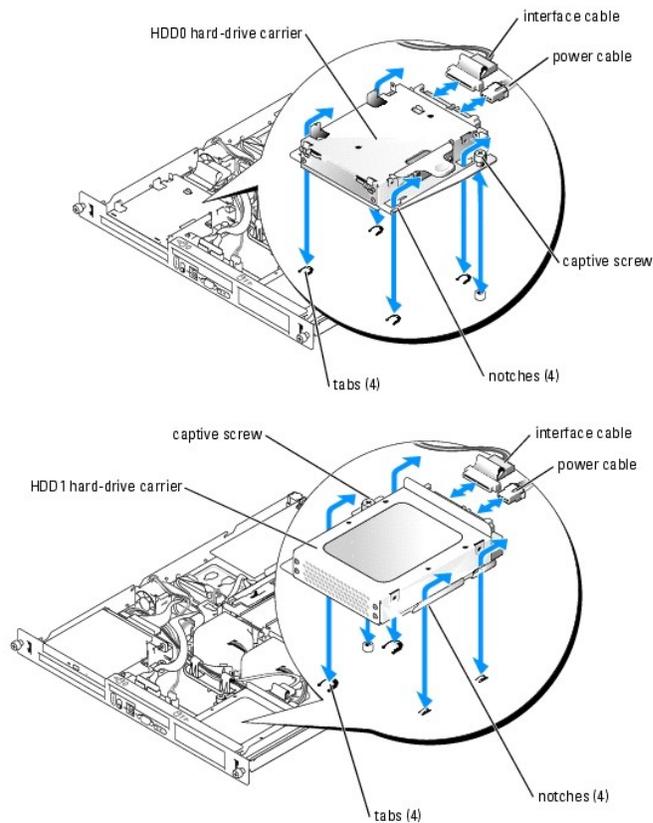
6. Using a #2 Phillips screwdriver, remove the four screws that secure the hard drive to the carrier and remove the drive from the carrier. See Figure 6-3.

Figure 6-3. Removing the Hard Drives From the Drive Carriers

HDD0 hard-drive carrier

hard drive

screws (4)

mounting holes (4)

HDD1 hard-drive carrier

hard drive

screws (4)

mounting holes (4)
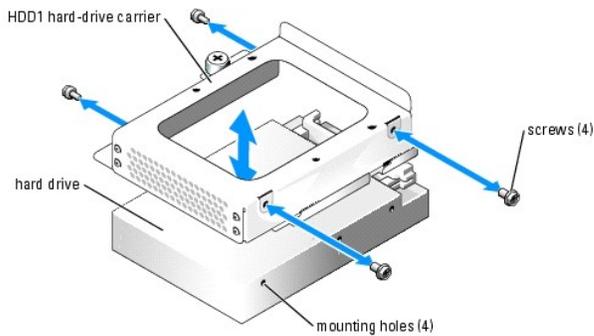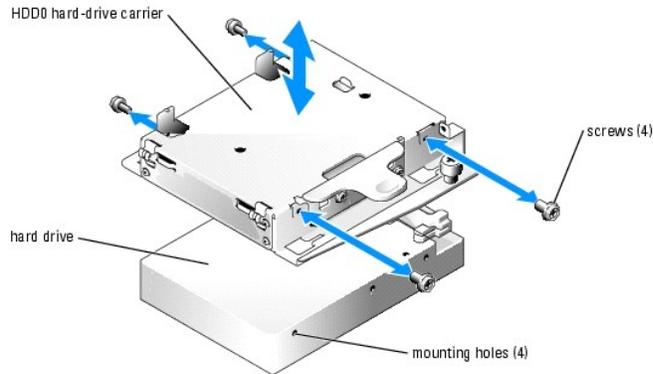
Installing a Hard Drive

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Align the hard-drive mounting holes with the holes in the drive carrier.

2. Using a #2 Phillips screwdriver, install the four screws that secure the hard drive to the carrier. See Figure 6-3.

3. Align the hard-drive carrier so that the tabs on the chassis slide into the notches in the carrier. See Figure 6-2.

4. Slide the carrier forward until it stops.

5. Tighten the captive screw that secures the hard-drive carrier to the chassis.

6. Connect the power and interface cables to the new drive.

   The interface cables for SATA hard drives are connected to the daughter card. See Figure A-3 for the location of the daughter card connectors.

   The interface cables for SCSI hard drives are connected to a SCSI controller card.

7. Install the CD drive.

   Install the CD drive if you are removing hard drive 0. See "Installing the Optical Drive."

8. Close the system. See "Closing the System" in "Troubleshooting Your System."

Installing a SCSI Controller Card

See "Installing an Expansion Card" in "Installing System Components" for general instructions about installing the controller card. See the controller card documentation for specific information on installing and configuring the card.

Service-Only Parts Replacement Procedures
Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Recommended Tools
- Control Panel Assembly
- Daughter Card
- System Board

Recommended Tools

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

- Key to the system keylock
- Wrist grounding strap
- #2 Phillips screwdriver

Control Panel Assembly

Removing the Control Panel Assembly

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect the control panel cables. See Figure 7-1.

3. Using a #2 Phillips screwdriver, remove the two screws that secure the control panel assembly to the chassis. See Figure 7-1.

4. Carefully lift the back of the control panel assembly to clear the chassis mounting studs, and remove the assembly from the system.

Figure 7-1. Removing the Control Panel Assembly
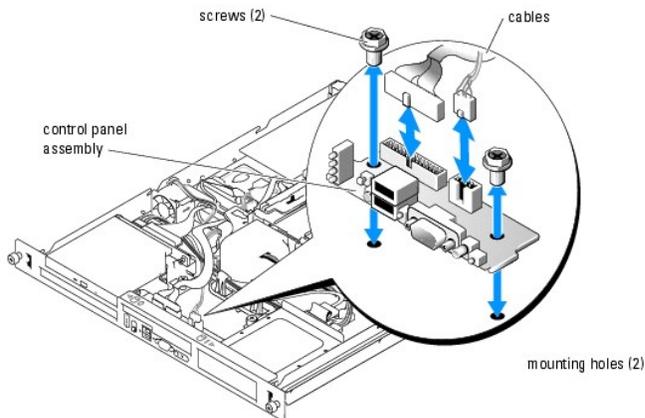
Installing the Control Panel Assembly

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Align the control panel assembly's mounting holes with the chassis mounting holes. See Figure 7-1.

2. Using a #2 Phillips screwdriver, install the two screws that secure the control panel assembly to the chassis. See Figure 7-1.

3. Connect the control panel cables. See Figure 7-1.

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Daughter Card

Removing the Daughter Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Disconnect the SATA, control panel, and optical drive cables, and disconnect the PCI fan cable if present. See Figure 7-2.

3. Using a #2 Phillips screwdriver, remove the screw that secures the daughter card to the chassis. See Figure 7-2.

4. Slide the daughter card away from the connector on the edge of the system board and remove it from the system.

Figure 7-2. Removing the Daughter Card
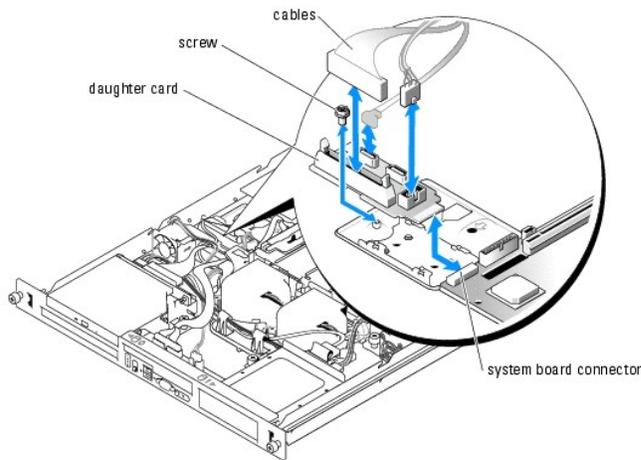
Installing the Daughter Card

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Slide the daughter card into the connector on the edge of the system board. See Figure 7-2.

2. Using a #2 Phillips screwdriver, install the screw that secures the daughter card to the chassis. See Figure 7-2.

3. Connect the optical drive, control panel, and SATA cables, and connect the PCI fan cable if applicable. See Figure 7-2.

4. Close the system. See "Closing the System" in "Troubleshooting Your System."

System Board

The system board provides interface signal routing between the system board and the two SATA hard-drive bays, the optional CD drive, and the control panel. In addition, the power supply is connected to the system board using two cables.

The system board and system board tray are removed and replaced as a single assembly.

Removing the System Board Assembly

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Open the system. See "Opening the System" in "Troubleshooting Your System."

2. Remove the cooling shroud. See "Removing the Cooling Shroud" in "Installing System Components."

3. Remove the heat sink and processor. See "Replacing the Processor" in "Installing System Components."

4. Remove the memory modules. See "Removing Memory Modules" in "Installing System Components."

    📝 **NOTE:** As you remove the memory modules, record the memory module socket locations to ensure proper installation.

5. Remove the fan module. See "Removing the Fan Assembly" in "Installing System Components."

6. If applicable, disconnect the optical drive interface cable from the daughter card connector PRI_IDE1. See Figure A-3.

7. Disconnect the two control-panel interface cables from the FRONT_PANEL connector on the system board and the USB_CONN connector on the daughter card. See Figure A-3.

8. Disconnect the hard-drive interface cables:

    a. If SCSI hard drives are installed, disconnect the interface cable from the controller card.

    b. If SATA hard drives are installed, disconnect the interface cable from the SATA_0 and SATA_1 connectors on the daughter card. See Figure A-3.

9. Remove all PCI expansion cards installed on the riser card. See "Removing an Expansion Card" in "Installing System Components."

10. Remove the riser card. See "Removing the Riser Card" in "Installing System Components."

11. Disconnect the chassis intrusion cable from the INTRUSION_SWITCH connector on the system board.

12. Disconnect the two power cables from the 12V and PWR_CONN connectors on the system board. See Figure A-3.

13. Loosen the captive screw that secures the system board tray to the chassis floor. See Figure 7-3.

14. Using the tab on the system board tray, slide the system board forward (toward the front of the system) and lift the assembly up and out of the chassis. See Figure 7-3.

15. Lay the system board tray down on a smooth, nonconductive work surface.

Figure 7-3. Removing the System Board Assembly

system board and system board tray

captive
screw
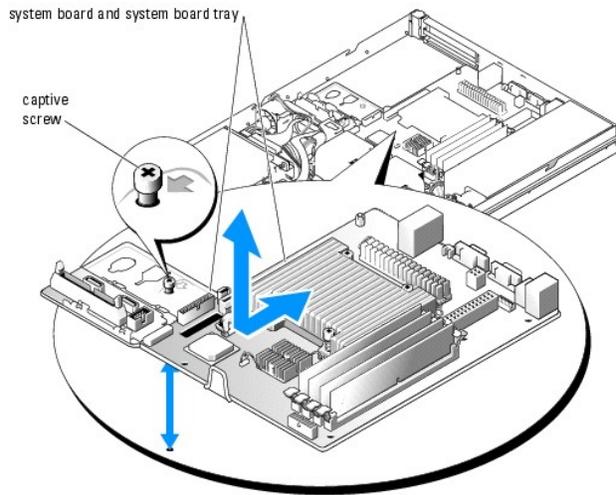
Installing the System Board Assembly

⚠ **CAUTION: Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. Before performing any procedure, see your *Product Information Guide* for complete information about safety precautions, working inside the computer and protecting against electrostatic discharge.**

1. Unpack the new system board assembly.

2. Align the system board tray so that the tabs on the chassis floor slide into the notches in the system board tray.

3. Slide the system board tray backward until it stops.

4. Using a #2 Phillips screwdriver, tighten the screw that secures the system board tray to the chassis. See Figure 7-3.

5. Install the fan module. See "Installing the Fan Assembly" in "Installing System Components."

6. Connect the two power cables to the 12V and PWR_CONN connectors on the system board. See Figure A-3.

7. Connect the chassis intrusion cable to the INTRUSION_SWITCH connector on the system board.

8. Install the riser card. See "Installing the Riser Card" in "Installing System Components."

9. Using a #2 Phillips screwdriver, tighten the two screws that secure the riser card to the system board.

10. Install any PCI expansion cards that you removed. See "Installing an Expansion Card" in "Installing System Components."

11. Connect the hard-drive interface cables:

    a. If SCSI hard drives are installed, connect the interface cable to the PCI controller card.

    b. If SATA hard drives are installed, connect the interface cable to the SATA_0 and SATA_1 connectors on the daughter card. See Figure A-3.

12. Install the processor and heat sink. See "Replacing the Processor" in "Installing System Components."

13. Install the memory modules. See "Installing Memory Modules" in "Installing System Components."

    📝 **NOTE:** Install the memory modules as noted in step 4 of the procedure in "Removing the System Board Assembly."

14. Connect the two control-panel interface cables to the FRONT_PANEL connector on the system board and the USB_CONN connector on the daughter card. See Figure A-3.

15. If applicable, connect the optical drive interface cable to the PRI_IDE1 connector on the daughter card. See Figure A-3.

16. Install the cooling shroud. See "Replacing the Processor" in "Installing System Components."

17. Close the system. See "Closing the System" in "Troubleshooting Your System."

Getting Help

Dell™ PowerEdge™ 850 Systems Installation and Troubleshooting Guide

- Technical Assistance
- Dell Enterprise Training and Certification
- Problems With Your Order
- Product Information
- Returning Items for Warranty Repair or Credit
- Before You Call
- Contacting Dell

Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the procedures in "Troubleshooting Your System."

2. Run the system diagnostics and record any information provided.

3. Make a copy of the Diagnostics Checklist, and fill it out.

4. Use Dell's extensive suite of online services available at Dell Support at **support.dell.com** for help with installation and troubleshooting procedures.

   For more information, see "Online Services."

5. If the preceding steps have not resolved the problem, call Dell for technical assistance.

NOTE: Call technical support from a phone near or at the system so that technical support can assist you with any necessary procedures.

NOTE: Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using the technical support service, see "Technical Support Service" and "Before You Call."

NOTE: Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Online Services

You can access Dell Support at **support.dell.com**. Select your region on the **WELCOME TO DELL SUPPORT** page, and fill in the requested details to access help tools and information.

You can contact Dell electronically using the following addresses:

- World Wide Web

  www.dell.com/

  www.dell.com/ap/ (Asian/Pacific countries only)

  www.dell.com/jp (Japan only)

  www.euro.dell.com (Europe only)

  www.dell.com/la (Latin American countries)

  www.dell.ca (Canada only)

- Anonymous file transfer protocol (FTP)

  ftp.dell.com/

  Log in as user:anonymous, and use your e-mail address as your password.

- Electronic Support Service

  support@us.dell.com

  apsupport@dell.com (Asian/Pacific countries only)

support.jp.dell.com (Japan only)

support.euro.dell.com (Europe only)

l　Electronic Quote Service

sales@dell.com

apmarketing@dell.com (Asian/Pacific countries only)

sales_canada@dell.com (Canada only)

l　Electronic Information Service

info@dell.com

AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop computer systems.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions.

The AutoTech service is available 24 hours a day, 7 days a week. You can also access this service through the technical support service. See the contact information for your region.

Automated Order-Status Service

To check on the status of any Dell™ products that you have ordered, you can go to **support.dell.com**, or you can call the automated order-status service. A recording prompts you for the information needed to locate and report on your order. See the contact information for your region.

Technical Support Service

Dell's technical support service is available 24 hours a day, 7 days a week, to answer your questions about Dell hardware. Our technical support staff use computer-based diagnostics to provide fast, accurate answers.

To contact Dell's technical support service, see "Before You Call" and then see the contact information for your region.

Dell Enterprise Training and Certification

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

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip available when you call. See the contact information for your region.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at **www.dell.com**. For the telephone number to call to speak to a sales specialist, see the contact information for your region.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.

   For the telephone number to call, see the contact information for your region.

2. Include a copy of the invoice and a letter describing the reason for the return.

3. Include a copy of any diagnostic information (including the Diagnostics Checklist) indicating the tests you have run and any error messages reported by

the system diagnostics.

4. Include any accessories that belong with the item(s) being returned (such as power cables, media such as CDs and diskettes, and guides) if the return is for credit.

5. Pack the equipment to be returned in the original (or equivalent) packing materials.

You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

Before You Call

NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the Diagnostics Checklist. If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer system itself. Ensure that the system documentation is available.

⚠️ **CAUTION: Before servicing any components inside your computer, see your *Product Information Guide* for important safety information.**

Diagnostics Checklist
Name:
Date:
Address:
Phone number:
Service Tag (bar code on the back of the computer):
Express Service Code:
Return Material Authorization Number (if provided by Dell support technician):
Operating system and version:
Peripherals:
Expansion cards:
Are you connected to a network? Yes No
Network, version, and network card:
Programs and versions:
See your operating system documentation to determine the contents of the system's start-up files. If possible, print each file. Otherwise, record the contents of each file before calling Dell.
Error message, beep code, or diagnostic code:
Description of problem and troubleshooting procedures you performed:

Contacting Dell

To contact Dell electronically, you can access the following websites:

- **www.dell.com**
- **support.dell.com** (technical support)
- **premiersupport.dell.com** (technical support for educational, government, healthcare, and medium/large business customers, including Premier, Platinum, and Gold customers)

For specific web addresses for your country, find the appropriate country section in the table below.

📝 **NOTE:** Toll-free numbers are for use within the country for which they are listed.

📝 **NOTE:** In certain countries, technical support specific to Dell Inspiron™ XPS computers is available at a separate telephone number listed for participating countries. If you do not see a telephone number listed that is specific for Inspiron XPS computers, you may contact Dell through the technical support number listed and your call will be routed appropriately.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in

determining which codes to use, contact a local or an international operator.

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Anguilla	General Support	toll-free: 800-335-0031
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires) International Access Code: **00** Country Code: **54** City Code: **11**	Website: **www.dell.com.ar**	
	E-mail: us_latin_services@dell.com	
	E-mail for desktop and portable computers: la-techsupport@dell.com	
	E-mail for servers and EMC® storage products: la_enterprise@dell.com	
	Customer Care	toll-free: 0-800-444-0730
	Tech Support	toll-free: 0-800-444-0733
	Tech Support Services	toll-free: 0-800-444-0724
	Sales	0-810-444-3355
Aruba	General Support	toll-free: 800-1578
Australia (Sydney) International Access Code: **0011** Country Code: **61** City Code: **2**	E-mail (Australia): au_tech_support@dell.com	
	E-mail (New Zealand): nz_tech_support@dell.com	
	Home and Small Business	1-300-655-533
	Government and Business	toll-free: 1-800-633-559
	Preferred Accounts Division (PAD)	toll-free: 1-800-060-889
	Customer Care	toll-free: 1-800-819-339
	Technical Support (portables and desktops)	toll-free: 1-300-655-533
	Technical Support (servers and workstations)	toll-free: 1-800-733-314
	Corporate Sales	toll-free: 1-800-808-385
	Transaction Sales	toll-free: 1-800-808-312
	Fax	toll-free: 1-800-818-341
Austria (Vienna) International Access Code: **900** Country Code: **43** City Code: **1**	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
	Home/Small Business Sales	0820 240 530 00
	Home/Small Business Fax	0820 240 530 49
	Home/Small Business Customer Care	0820 240 530 14
	Preferred Accounts/Corporate Customer Care	0820 240 530 16
	Home/Small Business Technical Support	0820 240 530 14
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	0820 240 530 00
Bahamas	General Support	toll-free: 1-866-278-6818
Barbados	General Support	1-800-534-3066
Belgium (Brussels) International Access Code: **00** Country Code: **32** City Code: **2**	Website: **support.euro.dell.com**	
	E-mail for French-speaking Customers: **support.euro.dell.com/be/fr/emaildell/**	
	Technical Support for Inspiron XPS computers only	02 481 92 96
	Technical Support for all other Dell computers	02 481 92 88
	Technical Support Fax	02 481 92 95
	Customer Care	02 713 15 .65
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	General Support	1-800-342-0671
Bolivia	General Support	toll-free: 800-10-0238
Brazil International Access Code: **00** Country Code: **55** City Code: **51**	Website: **www.dell.com/br**	
	Customer Support, Technical Support	0800 90 3355
	Technical Support Fax	51 481 5470
	Customer Care Fax	51 481 5480
	Sales	0800 90 3390
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei	Customer Technical Support (Penang, Malaysia)	604 633 4966

Country Code: 673	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario) International Access Code: **011**	Online Order Status: **www.dell.ca/ostatus**	
	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Technical Support (printers, projectors, televisions, handhelds, digital jukebox, and wireless)	1-877-335-5767
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago) Country Code: 56 City Code: 2	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
China (Xiamen) Country Code: 86 City Code: 592	Technical Support website: **support.dell.com.cn**	
	Technical Support E-mail: cn_support@dell.com	
	Customer Care E-mail: customer_cn@dell.com	
	Technical Support Fax	592 818 1350
	Technical Support (Dell™ Dimension™ and Inspiron)	toll-free: 800 858 2969
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	toll-free: 800 858 0950
	Technical Support (servers and storage)	toll-free: 800 858 0960
	Technical Support (projectors, PDAs, switches, routers, and so on)	toll-free: 800 858 2920
	Technical Support (printers)	toll-free: 800 858 2311
	Customer Care	toll-free: 800 858 2060
	Customer Care Fax	592 818 1308
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: **00** Country Code: **420**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	22537 2727
	Customer Care	22537 2707
	Fax	22537 2714
	Tech Fax	22537 2728
	Switchboard	22537 2711
Denmark (Copenhagen) International Access Code: **00** Country Code: **45**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/dk/da/emaildell/**	
	Technical Support for Inspiron XPS computers only	7010 0074
	Technical Support for all other Dell computers	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Switchboard Fax (Relational)	3287 1201

	Switchboard (Home/Small Business)	3287 5000
	Switchboard Fax (Home/Small Business)	3287 5001
Dominica	General Support	toll-**free:** 1-866-278-6821
Dominican Republic	General Support	1-800-148-0530
Ecuador	General Support	toll-**free:** 999-119
El Salvador	General Support	01-899-753-0777
Finland (Helsinki) International Access Code: **990** Country Code: **358** City Code: **9**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/fi/fi/emaildell/**	
	Technical Support	09 253 313 60
	Customer Care	09 253 313 38
	Fax	09 253 313 99
	Switchboard	09 253 313 00
France (Paris) (Montpellier) International Access Code: **00** Country Code: **33** City Codes: **(1) (4)**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/fr/fr/emaildell/**	
	Home and Small Business	
	Technical Support for Inspiron XPS computers only	0825 387 129
	Technical Support for all other Dell computers	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen) International Access Code: **00** Country Code: **49** City Code: **6103**	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
	Technical Support for Inspiron XPS computers only	06103 766-7222
	Technical Support for all other Dell computers	06103 766-7200
	Home/Small Business Customer Care	0180-5-224400
	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
Greece International Access Code: **00** Country Code: **30**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/gr/en/emaildell/**	
	Technical Support	00800-44 14 95 18
	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	General Support	toll-**free:** 1-866-540-3355
Guatemala	General Support	1-800-999-0136
Guyana	General Support	toll-**free:** 1-877-270-4609
Hong Kong International Access Code: **001** Country Code: **852**	Website: **support.ap.dell.com**	
	Technical Support E-mail: apsupport@dell.com	
	Technical Support (Dimension and Inspiron)	2969 3188
	Technical Support (OptiPlex, Latitude, and Dell Precision)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	Customer Care	3416 0910
	Large Corporate Accounts	3416 0907
	Global Customer Programs	3416 0908

	Medium Business Division	3416 0912
	Home and Small Business Division	2969 3105
India	Technical Support	1600 33 8045
	Sales (Large Corporate Accounts)	1600 33 8044
	Sales (Home and Small Business)	1600 33 8046
Ireland (Cherrywood) International Access Code: **16** Country Code: **353** City Code: **1**	Website: **support.euro.dell.com**	
	E-mail: dell_direct_support@dell.com	
	Technical Support for Inspiron XPS computers only	1850 200 722
	Technical Support for all other Dell computers	1850 543 543
	U.K. Technical Support (dial within U.K. only)	0870 908 0800
	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	1850 200 982
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	Fax/Sales Fax	01 204 0103
	Switchboard	01 204 4444
Italy (Milan) International Access Code: **00** Country Code: **39** City Code: **02**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/it/it/emaildell/**	
	Home and Small Business	
	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	General Support (dial from within Jamaica only)	1-800-682-3639
Japan (Kawasaki) International Access Code: **001** Country Code: **81** City Code: **44**	Website: **support.jp.dell.com**	
	Technical Support (servers)	toll-free: 0120-198-498
	Technical Support outside of Japan (servers)	81-44-556-4162
	Technical Support (Dimension and Inspiron)	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free:0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (PDAs, projectors, printers, routers)	toll-free: 0120-981-690
	Technical Support outside of Japan (PDAs, projectors, printers, routers)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Switchboard	044-556-4300
Korea (Seoul) International Access Code: **001** Country Code: **82** City Code: **2**	Technical Support	toll-free: 080-200-3800
	Sales	toll-free: 080-200-3600
	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	Switchboard	2194-6000
	Technical Support (Electronics and Accessories)	toll-free: 080-200-3801
	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093

Latin America	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600 or 512 728-3772
Luxembourg International Access Code: **00** Country Code: **352**	Website: **support.euro.dell.com**	
	E-mail: tech_be@dell.com	
	Technical Support (Brussels, Belgium)	3420808075
	Home/Small Business Sales (Brussels, Belgium)	toll-free: 080016884
	Corporate Sales (Brussels, Belgium)	02 481 91 00
	Customer Care (Brussels, Belgium)	02 481 91 19
	Fax (Brussels, Belgium)	02 481 92 99
	Switchboard (Brussels, Belgium)	02 481 91 00
Macao Country Code: **853**	Technical Support	toll-free: 0800 105
	Customer Service (Xiamen, China)	34 160 910
	Transaction Sales (Xiamen, China)	29 693 115
Malaysia (Penang) International Access Code: **00** Country Code: **60** City Code: **4**	Website: **support.ap.dell.com**	
	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free: 1 800 88 0193
	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	toll-free: 1 800 88 1306
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1800 88 1386
	Customer Service (**Penang, Malaysia)**	04 633 4949
	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213
Mexico International Access Code: **00** Country Code: **52**	Customer Technical Support	001-877-384-8979 or 001-877-269-3383
	Sales	50-81-8800 or 01-800-888-3355
	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800 or 01-800-888-3355
Montserrat	General Support	toll-free: 1-866-278-6822
Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam) International Access Code: **00** Country Code: **31** City Code: **20**	Website: **support.euro.dell.com**	
	Technical Support for Inspiron XPS computers only	020 674 45 94
	Technical Support for all other Dell computers	020 674 45 00
	Technical Support Fax	020 674 47 66
	Home/Small Business Customer Care	020 674 42 00
	Relational Customer Care	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand International Access Code: **00** Country Code: **64**	E-mail (New Zealand): nz_tech_support@dell.com	
	E-mail (Australia): au_tech_support@dell.com	
	Technical Support (for desktop and portable computers)	toll-free: 0800 446 255
	Technical Support (for servers and workstations)	toll-free: 0800 443 563
	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
Nicaragua	General Support	001-800-220-1006
Norway (Lysaker)	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/no/no/emaildell/**	
	Technical Support	671 16882

International Access Code: **00**	Relational Customer Care	671 17575
Country Code: **47**	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw)	Website: **support.euro.dell.com**	
	E-mail: pl_support_tech@dell.com	
	Customer Service Phone	57 95 700
International Access Code: **011**	Customer Care	57 95 999
Country Code: **48**	Sales	57 95 999
	Customer Service Fax	57 95 806
City Code: **22**	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/pt/en/emaildell/**	
	Technical Support	707200149
Country Code: **351**	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	General Support	1-800-805-7545
St. Kitts and Nevis	General Support	toll-**free:** 1-877-441-4731
St. Lucia	General Support	1-800-882-1521
St. Vincent and the Grenadines	General Support	toll-**free:** 1-877-270-4609
Singapore (Singapore)	Website: **support.ap.dell.com**	
	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	toll-**free:** 1800 394 7430
International Access Code: **005**	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-**free:** 1800 394 7488
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free:** 1800 394 7478
Country Code: **65**	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-**free:** 1 800 394 7412
	Corporate Sales	toll-**free:** 1 800 394 7419
Slovakia (Prague)	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	02 5441 5727
International Access Code: **00**	Customer Care	420 22537 2707
Country Code: **421**	Fax	02 5441 8328
	Tech Fax	02 5441 8328
	Switchboard (Sales)	02 5441 7585
South Africa (Johannesburg)	Website: **support.euro.dell.com**	
	E-mail: dell_za_support@dell.com	
International Access Code:	Gold Queue	011 709 7713
09/091	Technical Support	011 709 7710
	Customer Care	011 709 7707
Country Code: **27**	Sales	011 709 7700
City Code: **11**	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/es/es/emaildell/**	
	Home and Small Business	
	Technical Support	902 100 130
Spain (Madrid)	Customer Care	902 118 540
International Access Code: **00**	Sales	902 118 541
	Switchboard	902 118 541
Country Code: **34**	Fax	902 118 539
City Code: **91**	**Corporate**	
	Technical Support	902 100 130

	Customer Care	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby) International Access Code: **00** Country Code: **46** City Code: **8**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/se/sv/emaildell/**	
	Technical Support	08 590 05 199
	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	20 140 14 44
	Technical Support Fax	08 590 05 594
	Sales	08 590 05 185
Switzerland (Geneva) International Access Code: **00** Country Code: **41** City Code: **22**	Website: **support.euro.dell.com**	
	E-mail: Tech_support_central_Europe@dell.com	
	E-mail for French-speaking HSB and Corporate Customers: **support.euro.dell.com/ch/fr/emaildell/**	
	Technical Support (Home and Small Business)	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan International Access Code: **002** Country Code: **886**	Website: **support.ap.dell.com**	
	E-mail: ap_support@dell.com	
	Technical Support (OptiPlex, Latitude, Inspiron, Dimension, and Electronics and Accessories)	toll-**free: 00801 86 1011**
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free: 00801 60 1256**
	Transaction Sales	toll-**free: 00801 65 1228**
	Corporate Sales	toll-**free: 00801 651 227**
Thailand International Access Code: **001** Country Code: **66**	Website: **support.ap.dell.com**	
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-**free: 1800 0060 07**
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-**free: 1800 0600 09**
	Customer Service (Penang, Malaysia)	604 633 4949
	Corporate Sales	toll-**free: 1800 006 009**
	Transaction Sales	toll-**free: 1800 006 006**
Trinidad/Tobago	General Support	1-800-805-8035
Turks and Caicos Islands	General Support	toll-**free: 1-866-540-3355**
U.K. (Bracknell) International Access Code: **00** Country Code: **44** City Code: **1344**	Website: **support.euro.dell.com**	
	Customer Care website: **support.euro.dell.com/uk/en/ECare/Form/Home.asp**	
	E-mail: dell_direct_support@dell.com	
	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct and general)	0870 908 0800
	Global Accounts Customer Care	01344 373 186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	01344 373 185
	Preferred Accounts (500–5000 employees) Customer Care	0870 906 0010
	Central Government Customer Care	01344 373 193
	Local Government & Education Customer Care	01344 373 199
	Health Customer Care	01344 373 194
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Home and Small Business Fax	0870 907 4006
Uruguay	General Support	toll-**free: 000-413-598-2521**
	Automated Order-Status Service	toll-**free: 1-800-433-9014**
	AutoTech (portable and desktop computers)	toll-**free: 1-800-247-9362**
	Consumer (Home and Home Office)	
	Technical Support	toll-**free: 1-800-624-9896**
	Customer Service	toll-**free: 1-800-624-9897**
	DellNet™ Service and Support	toll-**free: 1-877-Dellnet**

		(1-877-335-5638)
	Employee Purchase Program (EPP) Customers	toll-**free:** 1-800-695-8133
	Financial Services website: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-**free:** 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-**free:** 1-800-283-2210
U.S.A. (Austin, Texas) International Access Code: **011** Country Code: **1**	**Business**	
	Customer Service and Technical Support	toll-**free:** 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-**free:** 1-800-695-8133
	Printers and Projectors Technical Support	toll-**free:** 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-**free:** 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-**free:** 1-800-234-1490
	Dell Sales	toll-**free:** 1-800-289-3355 or toll-**free:** 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-**free:** 1-888-798-7561
	Software and Peripherals Sales	toll-**free:** 1-800-671-3355
	Spare Parts Sales	toll-**free:** 1-800-357-3355
	Extended Service and Warranty Sales	toll-**free:** 1-800-247-4618
	Fax	toll-**free:** 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-**free:** 1-877-DELLTTY (1-877-335-5889)
U.S. Virgin Islands	General Support	1-877-673-3355
Venezuela	General Support	8001-3605