




# Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

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## 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 the *User's Guide*.

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June 2004

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## Jumpers and Connectors

Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Jumpers—A General Explanation](#)
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- [Disabling a Forgotten Password](#)

This section provides detailed 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.

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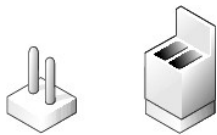
### Jumpers—A General Explanation

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 Jumpers



**⚠ CAUTION:** Ensure that the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.

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

[Figure A-2](#) shows the location and default settings of the system jumper blocks. See [Table A-1](#) for information about the system jumper designations, default settings, and functions.

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### System Board Jumpers

[Figure A-2](#) shows the location of the configuration jumpers on the system board. [Table A-1](#) lists the settings for the jumpers.

**🔧 NOTE:** Lift up the memory module airflow shroud for easy access to the jumpers.

Figure A-2. System Board Jumpers

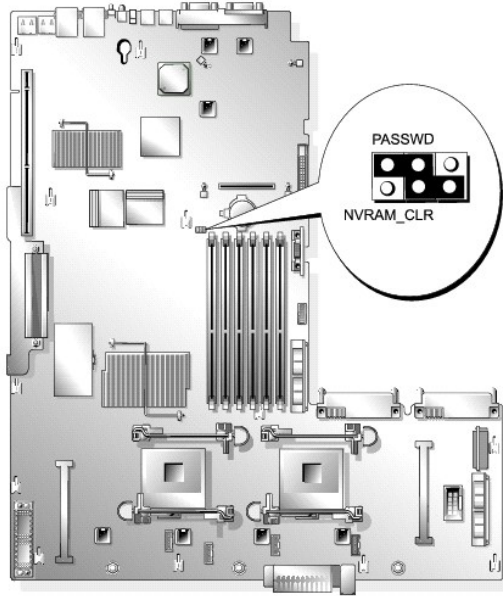






Table A-1. System Board Jumper Settings

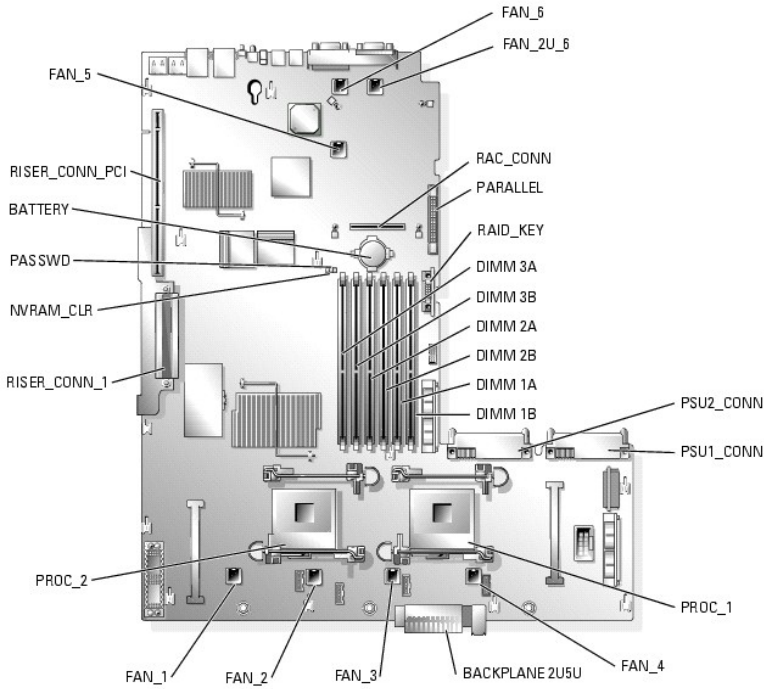
Jumper	Setting	Description
PASSWD	 (default)	The password feature is enabled.
		The password feature is disabled.
NVRAM_CLR	 (default)	The configuration settings are retained at system boot.
		The configuration settings are cleared at the next system boot. (If the configuration settings become corrupted to the point where the system will not boot, install the jumper and boot the system. Remove the jumper before restoring the configuration information.)

**NOTE:** For the full name of an abbreviation or acronym used in this table, see the "Glossary" in the *User's Guide*.

## System Board Connectors

See [Figure A-3](#) and [Table A-2](#) for the location and description of system board connectors.

Figure A-3. System Board Connectors



**Table A-2. System Board Connectors**

Connector	Description
BACKPLANE 2U5U	Backplane connector
BATTERY	System battery
DIMM <i>nX</i>	Memory modules (6), where <i>n</i> is the slot in the bank and <i>X</i> is the bank
FAN_ <i>n</i>	Cooling fans: <ul style="list-style-type: none"> <li>  1 — optional microprocessor 2</li> <li>  2, 3, 4 — microprocessor 1</li> <li>  5, 2U_6 — system fans</li> </ul>
PROC <i>n</i>	Microprocessors (2)
PSU <sub><i>n</i></sub> _CONN	Power supply connectors (2)
RAC_CONN	Remote access control (RAC) card
RAID_KEY	Hardware key for optional integrated RAID controller
RISER_CONN_1	Riser board connector
RISER_CONN_PCI	Riser board PCI bus connector
PARALLEL	Parallel connector
<b>NOTE:</b> For the full name of an abbreviation or acronym used in this table, see the "Glossary" in the <i>User's Guide</i> .	

## Expansion-Card Riser-Board Components and PCI Buses

[Figure A-4](#) shows the components on the PCI-X expansion-card riser board, including the expansion-card slots and buses. [Table 6-1](#) lists the PCI bus and operating speed for each expansion-card slot. [Figure A-5](#) shows the components on the optional PCI-X/PCIe expansion-card riser board, including the expansion-card slots and buses. [Table 6-2](#) lists the PCI bus and operating speed for each expansion-card slot.

**Figure A-4. PCI-X Expansion-Card Riser Board Components**

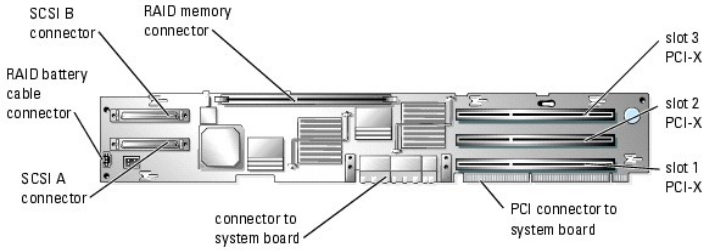
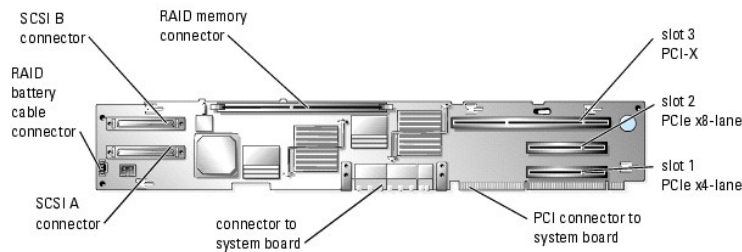


Figure A-5 shows the components on the optional PCI-X/PCIe expansion-card riser board, including the expansion-card slots and buses. Table 6-2 lists the PCI bus and operating speed for each expansion-card slot.

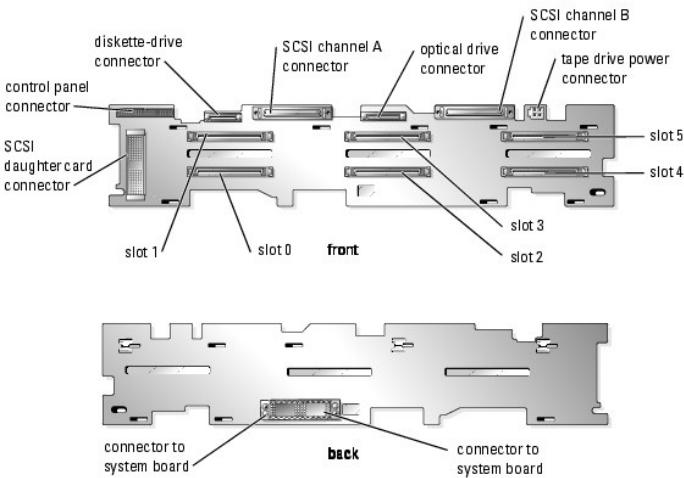
Figure A-5. Optional PCI-X/PCIe Expansion-Card Riser Board Components



## SCSI Backplane Board Connectors

Figure A-6 shows the location of the connectors on the SCSI backplane board.

Figure A-6. SCSI Backplane Board Components



## 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 the *User's Guide*. The password jumper enables these password features or disables them and clears any password(s) currently in use.


**NOTICE:** See "Protecting Against Electrostatic Discharge" in the safety instructions in your *Product Information Guide*.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."

3. Lift up the memory module shroud.
4. Remove the jumper plug from the password jumper.  
See [Figure A-2](#) to locate the password jumper (labeled "PASSWD") on the system board.
5. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."

6. Reconnect your system and peripherals to their electrical outlets, 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.

7. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
  8. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
  9. Install the jumper plug on the password jumper.
  10. Lower the memory module shroud.
  11. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
  12. Reconnect your system and peripherals to their electrical outlets, and turn on the system.
  13. Assign a new system and/or setup password.  
To assign a new password using the System Setup program, see "Assigning a System Password" in the *User's Guide*.
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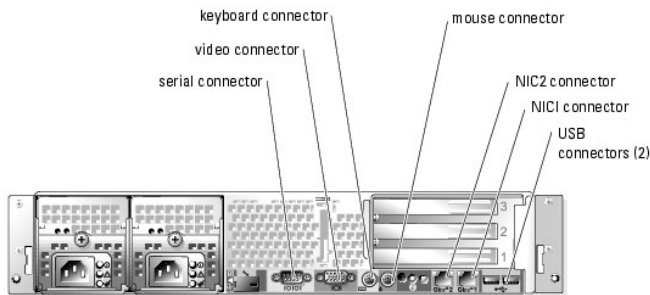
## I/O Connectors

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Serial 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
	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

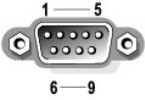
The default designation of the integrated serial connector is COM1. When you add an expansion card containing a serial connector that has the same designation as the integrated connector, the system's autoconfiguration feature remaps (reassigns) the integrated serial connector to the next available designation. 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-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

## PS/2-Compatible Keyboard and Mouse Connectors

The PS/2-compatible keyboard and mouse cables attach to 6-pin, miniature DIN connectors. [Figure B-3](#) illustrates the pin numbers for these connectors and [Table B-3](#) defines the pin assignments for these connectors.

**Figure B-3. PS/2-Compatible Keyboard and Mouse Connector Pin Numbers**



**Table B-3. Keyboard and Mouse Connector Pin Assignments**

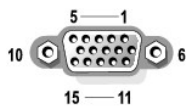
Pin	Signal	I/O	Definition
1	KBDATA or MFDATA	I/O	Keyboard data or mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	KBCLK or MFCLK	I/O	Keyboard clock or mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

## 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 on the system front or back panel. [Figure B-4](#) 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-4. Video Connector Pin Numbers**



**Table B-4. Video Connector Pin Assignments**

Pin	Signal	I/O	Definition



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. [Figure B-5](#) 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-5. USB Connector Pin Numbers**



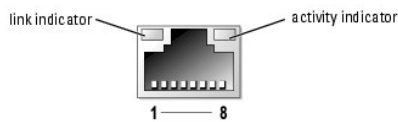
**Table B-5. USB Connector Pin Assignments**

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 Connectors

Each of the system's integrated NIC's function as a separate network expansion card while providing fast communication between servers and workstations. [Figure B-6](#) illustrates the pin numbers for the NIC connector and [Table B-6](#) defines the pin assignments for the connectors.

**Figure B-6. 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

## 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.

- 1 Use Category 5 or greater wiring and connectors.
- 1 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.

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## Introduction

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Other Documents You May Need](#)
- [Obtaining Technical Assistance](#)

Your high-speed system offers significant service and upgrade features. The system includes the following service features to make troubleshooting and repair easy and effective:


- 1 Embedded remote access hardware, which monitors temperatures and voltages throughout the system and notifies you if the system overheats, if a system cooling fan malfunctions, or if a power supply fails
- 1 Redundant, hot-pluggable cooling fans
- 1 Redundant, hot-pluggable power supplies
- 1 System diagnostics, which checks for hardware problems (if the system can boot)

System upgrade options are offered, including:

- 1 An additional microprocessor
- 1 Additional system memory
- 1 A variety of PCI, PCI Express (PCIe), and PCI-X expansion-card options (including RAID controller cards)
- 1 An integrated RAID controller that can be activated with an additional memory module, key, and battery

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## 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.

- 1 The *Rack Installation Guide* or *Rack Installation Instructions* included with your rack solution describes how to install your system into a rack.
- 1 The *Getting Started Guide* provides an overview of initially setting up your system.
- 1 The *User's Guide* provides information about system features and technical specifications.
- 1 The *Installation and Troubleshooting Guide* describes how to troubleshoot the system and install or replace system components.
- 1 Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- 1 Operating system documentation describes how to install (if necessary), configure, and use the operating system software.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 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.

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

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## Obtaining Technical Assistance

If at any time you do not understand a procedure described in this guide or if your system does not perform as expected, a number of tools are provided to help you. For more information on these help tools, see "[Getting Help](#)."

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## Indicators, Messages, and Codes

Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Indicators on the Optional Bezel](#)
- [Front-Panel Indicators and Features](#)
- [SCSI Hard-Drive Indicator Codes](#)
- [Back-Panel Indicators and Features](#)
- [Power Indicator Codes](#)
- [NIC Indicator Codes](#)
- [LCD Status Messages](#)
- [System Messages](#)
- [System Beep Codes](#)
- [Warning Messages](#)
- [Diagnostics Messages](#)
- [Alert 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:

- 1 System indicators
- 1 System messages
- 1 Beep codes
- 1 Warning messages
- 1 Diagnostics messages
- 1 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.

---

### Indicators on the Optional Bezel

The optional locking system bezel 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. The back-panel indicator connector allows an indicator to be attached that will also function the same as the bezel indicator. See [Figure 2-3](#).

[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 indicator	Amber indicator	Description
Off	Off	Power is not available to the system
Off	Blinking	The system has detected an error.
On	Off	Power is on, and the system is operational.
Blinking	Off	The indicator has been activated to identify the system in a rack.

**NOTE:** While the system is being identified, the blue indicator blinks even though an error has been detected. After the system is identified, the blue indicator stops blinking and the amber indicator resumes blinking.

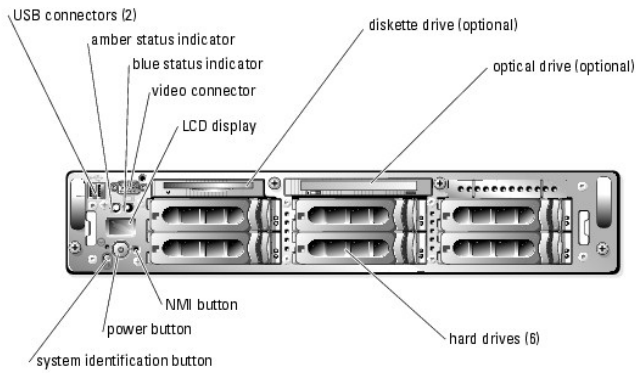
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### Front-Panel Indicators and Features

Additional indicators are located behind the bezel. The front-panel status LCD provides information using an alphanumeric character display. See "[LCD Status Messages](#)."

[Figure 2-1](#) shows the front-panel indicators and features of the system. [Table 2-2](#) describes the front-panel features.

**Figure 2-1.** Front-Panel Features



**NOTE:** Hard drives bays are numbered 0 through 5 starting at the lower leftmost drive bay.

**Table 2-2. Front-Panel LED Indicators, Buttons, and Connectors**

Indicator, Button, or Connector	Icon	Description
blue system status indicator		Does not operate when the optional bezel is removed. The LCD display indicates the status.
amber system status indicator		Does not operate when the optional bezel is removed. The LCD display indicates the status.
LCD display		Provides system ID, status information, and system error messages.  The LCD display lights up during normal system operation. Both the systems management software and the identification buttons located on the front and back of the system can cause the LCD to flash blue to identify a particular system.  The LCD display flashes amber when the system needs attention due to a problem with power supplies, fans, system temperature, or hard drives.  <b>NOTE:</b> If the system is connected to AC power and an error has been detected, the LCD display flashes amber regardless of whether the system has been powered on.
power-on indicator, power button		The power-on indicator lights when the system power is on. The power-on indicator blinks when power is available to the system, but the system is not powered on.  The power button controls the DC power supply output to the system.  <b>NOTE:</b> If you turn off the system using the power button and the system is running an ACPI-compliant operating system, the system performs a graceful shutdown before the power is turned off. If the system is not running an ACPI-compliant operating system, the power is turned off immediately after the power button is pressed.
system identification button		The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed, the blue system status indicator on the front and back blinks until one of the buttons is pushed again.
USB connectors		Connects USB 2.0-compliant devices to the system.
NMI button		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.
video connector		Connects a monitor to the system.

## SCSI Hard-Drive Indicator Codes

If RAID is activated, two indicators on each of the hard-drive carriers provide information on the status of the SCSI hard drives. RAID can be enabled either by using ROMB on the optional riser card or by using a RAID card connected to the backplane. See [Figure 2-2](#) and [Table 2-3](#). The SCSI backplane firmware controls the drive power-on/fault indicator.

**Figure 2-2. SCSI Hard-Drive Indicators**

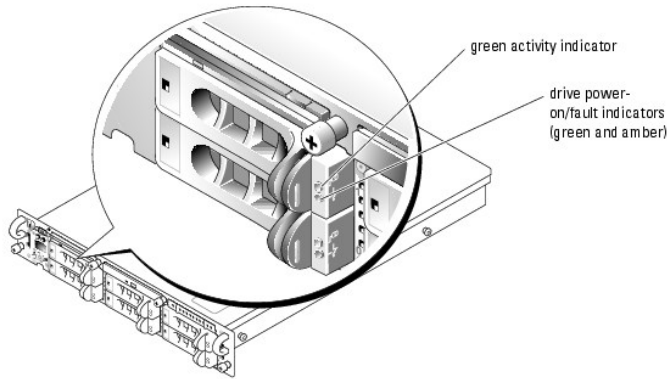


Table 2-3 lists the drive indicator patterns. Different patterns are displayed as drive events occur in the system. For example, if a hard-drive fails, the "drive failed" pattern appears. After the drive is selected for removal, the "drive being prepared for removal" pattern appears, followed by the "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 RAID is not activated, only the "drive online" indicator pattern appears. The drive-activity indicator also blinks when the drive is being accessed.

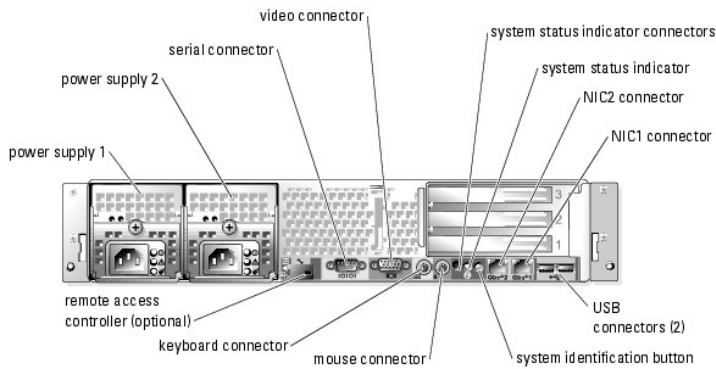
**Table 2-3. Hard-Drive Indicator Patterns**

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.

## Back-Panel Indicators and Features

Figure 2-3 shows the back-panel features of the system. Table 2-4 describes the back-panel features.

**Figure 2-3. Back-Panel Features**



**Table 2-4. Back-Panel Features**

Component	Description
Power supply indicators	Provides information on power status. See " <a href="#">Power Indicator Codes.</a> "
NIC indicators	Provides information on NIC status. See " <a href="#">NIC Indicator Codes.</a> "

System status indicator connector	Connects to an indicator that can signify when the system is operating correctly or when the system needs attention. See " <a href="#">Indicators on the Optional Bezel.</a> "
System identification indicator	Signifies when the system is operating correctly or when the system needs attention, and can identify a particular system.
System identification button	Can be used to identify a particular system.

## Power Indicator Codes

The system has indicators on the front panel and the power supplies that signify system power status.

### Power-Button 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 2-5](#) lists the power button indicator codes.

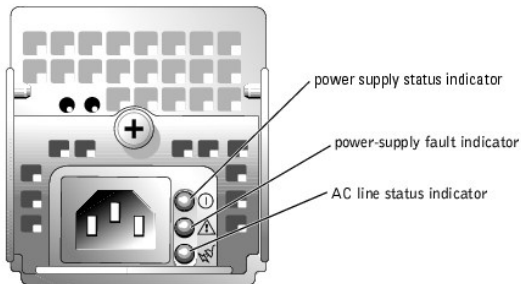
**Table 2-5. Power-Button Indicator Codes**

Indicator	Indicator Code
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 more information on standby states, see your operating system documentation.

### Redundant Power-Supply Indicator Codes

The indicators on the optional redundant power supplies show whether power is present or whether a power fault has occurred. See [Figure 2-4](#), [Table 2-6](#) lists the power-supply indicator codes.

**Figure 2-4. Redundant Power-Supply Indicators**



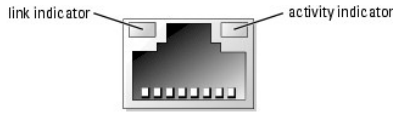
**Table 2-6. Power-Supply Indicator Codes**

Indicator	Indicator Code
Power-on	Green indicates that the power supply is operational.
Fault	Red indicates a problem with the power supply (fan failure, voltage error, etc.).
Power present	Green indicates that power is present at the power supply and that the system is connected to a power source.

## NIC Indicator Codes

Each NIC on the back panel has an indicator that provides information on network activity and link status. See [Figure 2-5](#), [Table 2-7](#) lists the NIC indicator codes on the back panel.

**Figure 2-5. NIC Indicators**



**Table 2-7. NIC Indicator Codes**

Indicator	Indicator Code
Link and activity indicators are off	The NIC is not connected to the network.
Link indicator is green	The NIC is connected to a valid link partner on the network.
Activity indicator is amber blinking	Network data is being sent or received.

## LCD Status Messages

The system's bezel indicator can signify when the system is operating correctly or when the system needs attention. When the bezel indicator signifies an error condition, remove the bezel to see further information provided by the status LCD.

The LCD can display two lines of alphanumeric characters. The display codes are presented in two color combinations:

- 1 White characters on a blue background — Information only; no action is required.
- 1 Amber characters on a black background — The system needs attention.

[Table 2-8](#) lists the LCD status messages that can occur and the probable cause for each message. The LCD messages refer to events recorded in the SEL. For information on the SEL and configuring system management settings, see the systems management software documentation.

**CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

**Table 2-8. LCD Status Messages**

Line 1 Message	Line 2 Message	Causes	Corrective Actions
<i>SYSTEM ID</i>	SYSTEM NAME	<p><i>SYSTEM ID</i> is a unique name, five characters or less, defined by the user.</p> <p><i>SYSTEM NAME</i> is a unique name, 16 characters or less, defined by the user.</p> <p>The system ID and name display under the following conditions:</p> <ul style="list-style-type: none"> <li>1 The system is powered on.</li> <li>1 The power is off and active POST errors are displayed.</li> </ul>	<p>This message is for information only.</p> <p>You can change the system ID and name in the System Setup program. See your system's <i>User's Guide</i> for instructions.</p>
E0000	OVRFLW CHECK LOG	<p>LCD overflow message.</p> <p>A maximum of three error messages can display sequentially on the LCD. The fourth message displays as the standard overflow message.</p>	Check the SEL for details on the events.
E0119	TEMP AMBIENT	Ambient system temperature is out of acceptable range.	See " <a href="#">Troubleshooting System Cooling Problems</a> " in "Troubleshooting Your System."
E0119	TEMP BP	Backplane board is out of acceptable temperature range.	
E0119	TEMP CPU <i>n</i>	Specified microprocessor is out of acceptable temperature range.	See " <a href="#">Troubleshooting System Cooling Problems</a> " in "Troubleshooting Your System." If the problem persists, ensure that the microprocessor heat sinks are properly installed (see " <a href="#">Processors</a> " in "Installing System Options").
E0119	TEMP SYSTEM	System board is out of acceptable temperature range.	See " <a href="#">Troubleshooting System Cooling Problems</a> " in "Troubleshooting Your System."
E0212	VOLT 3.3	System power supply is out of acceptable voltage range; faulty or improperly installed power supply.	See " <a href="#">Troubleshooting Power Supplies</a> " in "Troubleshooting Your System."
E0212	VOLT 5		
E0212	VOLT 12		
E0212	VOLT BATT	Faulty battery; faulty system board.	See " <a href="#">Troubleshooting the System Battery</a> " in "Troubleshooting Your System."
E0212	VOLT BP 12	Backplane board is out of acceptable voltage	Ensure that the power cables are securely connected to the backplane



E0212	VOLT BP 3.3	range.	board (see "Installing Drives"). If the problem persists, see " <a href="#">Troubleshooting Power Supplies</a> " in "Troubleshooting Your System."
E0212	VOLT BP 5		
E0212	VOLT CPU VRM	Microprocessor VRM voltage is out of acceptable range; faulty or improperly installed microprocessor VRM; faulty system board.	This message is not applicable to this system.
E0212	VOLT NIC 1.8V	Integrated NIC voltage is out of acceptable range; faulty or improperly installed power supply; faulty system board.	See " <a href="#">Troubleshooting Power Supplies</a> " in "Troubleshooting Your System."
E0212	VOLT NIC 2.5V		
E0212	VOLT PLANAR REG	System board is out of acceptable voltage range; faulty or improperly installed system board.	
E0276	CPU VRM n	Specified microprocessor VRM is faulty, unsupported, improperly installed, or missing.	These messages are not applicable to this system.
E0276	MISMATCH VRM n		
E0280	MISSING VRM n		
E0319	PCI OVER CURRENT	Faulty or improperly installed expansion card.	See " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
E0412	RPM FAN n	Specified cooling fan is faulty, improperly installed, or missing.	See " <a href="#">Troubleshooting a Fan</a> " in "Troubleshooting Your System."
E0780	MISSING CPU 1	Microprocessor is not installed in socket PROC_1.	Install a microprocessor in socket PROC_1 (see " <a href="#">Processors</a> " in "Installing System Options"). To identify microprocessor socket PROC_1, see <a href="#">Figure A-3</a> .
E07F0	CPU IERR	Faulty or improperly installed microprocessor.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System."
E07F1	TEMP CPU n HOT	Specified microprocessor is out of acceptable temperature range and has halted operation.	See " <a href="#">Troubleshooting System Cooling Problems</a> " in "Troubleshooting Your System." If the problem persists, ensure that the microprocessor heat sinks are properly installed (see " <a href="#">Processors</a> " in "Installing System Options").
E07F4	POST CACHE	Faulty or improperly installed microprocessor.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System."
E07F4	POST CPU REG		
E07F4	POST CPU SMI	SMI handler failed to initialize; faulty system board.	See " <a href="#">Getting Help</a> ."
E07FA	TEMP CPU n THERM	Specified microprocessor is out of acceptable temperature range and is operating at a reduced speed, or frequency.	See " <a href="#">Troubleshooting System Cooling Problems</a> " in "Troubleshooting Your System." If the problem persists, ensure that the microprocessor heat sinks are properly installed (see " <a href="#">Processors</a> " in "Installing System Options").
E0876	POWER PS n	No power available from the specified power supply; specified power supply is improperly installed or faulty.	See " <a href="#">Troubleshooting Power Supplies</a> " in "Troubleshooting Your System."
E0880	INSUFFICIENT PS	Insufficient power is being supplied to the system; power supplies are improperly installed, faulty, or missing.	See " <a href="#">Troubleshooting Power Supplies</a> " in "Troubleshooting Your System."
E0CB2	MEM SPARE ROW	Correctable errors threshold was met in a memory bank; errors were remapped to the spare row.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0CF1	MBE DIMM Bank n	Memory modules installed in the specified bank are not the same type and size; faulty memory module (s).	Ensure that all banks contain memory modules of the same type and size and that they are properly installed. If the problem persists, see " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0CF1	POST MEM 64K	Parity failure in the first 64 KB of main memory.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0CF1	POST NO MEMORY	Main-memory refresh verification failure.	Ensure that all banks contain memory modules of the same type and size and that they are properly installed. If the problem persists, see " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0CF5	LOG DISABLE SBE	Multiple single-bit errors on a single memory module.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0D76	DRIVE FAIL	Faulty or improperly installed hard drive or RAID controller.	See " <a href="#">Troubleshooting SCSI Hard Drives</a> " and " <a href="#">Troubleshooting a RAID Controller Card</a> " in "Troubleshooting Your System."
E0F04	POST CMOS	CMOS write/read failure; faulty system board.	See " <a href="#">Getting Help</a> ."
E0F04	POST CPU SPEED	Microprocessor speed control sequence failure.	See " <a href="#">Getting Help</a> ."
E0F04	POST DMA INIT	DMA initialization failure; DMA page register write/read failure.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0F04	POST DMA REG	Faulty system board.	See " <a href="#">Getting Help</a> ."
E0F04	POST KYB CNTRL	Faulty keyboard controller; faulty system board.	See " <a href="#">Getting Help</a> ."
E0F04	POST MEM RFSH	Main-memory refresh verification failure.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0F04	POST PIC REG	Master or slave PIC register test failure.	See " <a href="#">Getting Help</a> ."
E0F04	POST SHADOW	BIOS-shadowing failure.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E0F04	POST SHD TEST	Shutdown test failure.	
E0F04	POST SIO	Super I/O chip failure; faulty system board.	See " <a href="#">Getting Help</a> ."
E0F04	POST TIMER	Programmable interval timer test failure; faulty system board.	See " <a href="#">Getting Help</a> ."
E0FOB	POST ROM CHKSUM	Faulty or improperly installed expansion card.	See " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
E0F0C	VID MATCH CPU n	Specified microprocessor is faulty, unsupported, improperly installed, or missing.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System."

E10F3	LOG DISABLE BIOS	BIOS disabled logging errors.	Check the SEL for details on the errors.
E13F2	IO CHANNEL CHECK	Faulty or improperly installed expansion card; faulty system board.	See " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
E13F4	PCI PARITY		
E13F5	PCI SYSTEM		
E13F8	CPU BUS INIT	Faulty or improperly installed microprocessor or system board.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System." If the problem persists, see " <a href="#">Getting Help</a> ."
E13F8	CPU BUS PARITY	Faulty system board.	See " <a href="#">Getting Help</a> ."
E13F8	CPU MCKERR	Machine check error; faulty or improperly installed microprocessor; faulty system board.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System."
E13F8	HOST BUS	Faulty system board.	See " <a href="#">Getting Help</a> ."
E13F8	HOST TO PCI BUS		
E13F8	MEM CONTROLLER	Faulty or improperly installed memory module; faulty system board.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
E1580	POWER CONTROL	Faulty system board.	See " <a href="#">Getting Help</a> ."
E20F1	OS HANG	Operating system watchdog timer timed out.	Restart your system. If the problem persists, see your operating system documentation.
EFFF0	RAC ERROR	Remote access controller firmware failure; faulty system board.	See " <a href="#">Getting Help</a> ."
EFFF1	POST ERROR	BIOS error.	Update the BIOS firmware (see " <a href="#">Getting Help</a> ").
EFFF2	BP ERROR	Faulty or improperly installed backplane board.	Ensure that the interface cables are securely connected to the backplane board (see " <a href="#">Installing Drives</a> "). If the problem persists, see " <a href="#">Getting Help</a> ."
<b>NOTE:</b> For the full name of an abbreviation or acronym used in this table, see the "Glossary" in the <i>User's Guide</i> .			

## Solving Problems Described by LCD Status Messages

When a single message appears on the status LCD, locate the code in [Table 2-8](#) and perform the suggested corrective action. The code on the LCD can often specify a very precise fault condition that is easily corrected. For example, if the code E0780 MISSING CPU 1 appears, you know that a microprocessor is not installed in socket 1.

In contrast, you might be able to determine the problem if multiple related errors occur. For example, if you receive a series of messages indicating multiple voltage faults, you might determine that the problem is a failing power supply.

## Removing LCD Status Messages

For faults associated with sensors, such as temperature, voltage, fans, and so on, the LCD message is automatically removed when that sensor returns to a normal state. For example, if temperature for a component goes out of range, the LCD displays the fault; when the temperature returns to the acceptable range, the message is removed from the LCD. For other faults, you must take action to remove the message from the display:


- 1 Clear the SEL — You can perform this task remotely, but you will lose the event history for the system.
- 1 Chassis intrusion — When you remove the cover, the system assumes that you are servicing the bad component; the LCD clears when you replace the cover.
- 1 Power cycle — Turn off the system and disconnect it from the electrical outlet; wait approximately ten seconds, reconnect the power cable, and restart the system.


Any of these actions will remove fault messages, and return the status indicators and LCD colors to the normal state. Messages will reappear under the following conditions:

- 1 The sensor returns to a normal state but fails again, resulting in a new SEL entry.
- 1 The system is reset and new error events are detected.
- 1 A failure is recorded from another source that maps to the same display entry.

## System Messages

System messages appear on the screen to notify you of a possible problem with the system. [Table 2-9](#) 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 2-9](#), 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.

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

**Table 2-9. System Messages**

Message	Causes	Corrective Actions
Address mark not found	Faulty optical/diskette drive subsystem or hard-drive subsystem; faulty system board.	See " <a href="#">Troubleshooting a Diskette Drive</a> ," " <a href="#">Troubleshooting an Optical Drive</a> ," and " <a href="#">Troubleshooting SCSI Hard Drives</a> " in "Troubleshooting Your System."
Alert! Current configuration does not support redundant memory. Redundant memory is disabled.	Memory modules installed are not the same type and size in all banks; faulty memory module(s).	Ensure that all banks contain memory modules of the same type and size and that they are properly installed. If the problem persists, see " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Amount of available memory limited to 256 MB!	<b>OS Install Mode</b> is enabled in the System Setup program.	Disable <b>OS Install Mode</b> in the System Setup program. See "Using the System Setup program" in the <i>User's Guide</i> .
Auxiliary device failure	Loose or improperly connected mouse or keyboard cable; faulty mouse or keyboard.	See " <a href="#">Troubleshooting the Mouse</a> " and " <a href="#">Troubleshooting the Keyboard</a> " in "Troubleshooting Your System."
BIOS Update Attempt Failed!	Remote BIOS update attempt failed.	Retry the BIOS update. If problem persists, see " <a href="#">Getting Help</a> ."
CD-ROM drive not found	<b>IDE CD-ROM Controller</b> option is enabled in the System Setup program, but the optical drive is not detected.	If the system does not have an optical drive, disable the <b>IDE CD-ROM Controller</b> option in the System Setup program. See "Using the System Setup program" in the <i>User's Guide</i> .  If the system has an optical drive, ensure that it is properly connected. See " <a href="#">Troubleshooting an Optical Drive</a> " in "Troubleshooting Your System."
CPUs with different cache sizes detected	Microprocessors with different cache sizes are installed.	Ensure that all microprocessors have the same cache size and that they are properly installed. See " <a href="#">Processors</a> " in "Installing System Options."
Decreasing available memory	Faulty or improperly installed memory modules.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Diskette drive n seek failure	Incorrect configuration settings in the System Setup program.  Faulty or improperly installed diskette drive.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in the <i>User's Guide</i> .  See " <a href="#">Troubleshooting a Diskette Drive</a> " in "Troubleshooting Your System."
Diskette read failure	Faulty or improperly inserted diskette.	Replace the diskette.
Diskette subsystem reset failed	Faulty or improperly installed diskette drive.	See " <a href="#">Troubleshooting a Diskette Drive</a> " in "Troubleshooting Your System."
ECC memory error	Faulty or improperly installed memory modules.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Embedded RAID error	Embedded RAID firmware responds with an error.	See " <a href="#">Getting Help</a> ."
Embedded RAID Firmware is not present	Embedded RAID Firmware does not respond.	See " <a href="#">Getting Help</a> ."
Error: Incorrect memory configuration.  Ensure memory in slots DIMM1_A and DIMM1_B, DIMM2_A and DIMM2_B, DIMM3_A and DIMM3_B match identically in size, speed, and rank.	Unmatched DIMM pairs are detected.	Ensure that the memory modules are installed in matched pairs. See " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components."
Error: Incorrect memory configuration.  Memory slots DIMM3_A and DIMM3_B only support single rank DIMMs. Remove the dual rank DIMMs from slots DIMM3_A and DIMM3_B.	Dual-rank memory modules are installed in memory slots DIMM3_A and DIMM3_B. These memory slots do not support dual-rank memory modules.	Remove the memory modules from slots DIMM3_A and DIMM3_B. See " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components."
Error: Incorrect memory configuration.  Memory slots DIMM3_A and DIMM3_B must be empty if Dual Rank memory DIMMs are in slots DIMM2_A and DIMM2_B.	Memory modules are installed in memory slots DIMM3_A and DIMM3_B. These memory slots must be empty if dual rank DIMMs are installed in memory slots DIMM2_A and DIMM2_B.	Remove the memory modules from slots DIMM3_A and DIMM3_B. See " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components."
Error: Incorrect memory configuration.  Move DIMM3_A and DIMM3_B into DIMM2_A and DIMM2_B.	Memory modules are not populated from lowest-number bank to highest-number bank.	Move memory modules from memory slots DIMM3_A and DIMM3_B into memory slots DIMM2_A and DIMM2_B. See " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components."
Error: Incorrect memory configuration.  Swap the DIMMs in slots DIMM1_A and DIMM1_B with DIMMs in slots DIMM2_A and DIMM2_B.	Memory slots DIMM1_A and DIMM1_B must be populated with dual-rank DIMMs if dual-rank DIMMs are populated in the system.	Swap the memory modules in DIMM1_A and DIMM1_B with the memory modules in slots DIMM2_A and DIMM2_B. See " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components."
Error: Maximum PCI option ROM count exceeded!	Too many expansion cards have ROM enabled in the System Setup program.	Disable ROM for some of the expansion cards. See "Using the System Setup Program" in the <i>User's Guide</i> .
Gate A20 failure	Faulty keyboard controller; faulty system board.	See " <a href="#">Getting Help</a> ."
Hard disk controller failure	Incorrect configuration settings in System Setup program; improperly installed hard drive, or loose interface or power cable; faulty hard-drive controller subsystem.	Run the System Setup program to correct the drive type. See "Using the System Setup Program" in the <i>User's Guide</i> . If the problem persists, see " <a href="#">Troubleshooting SCSI Hard Drives</a> " in "Troubleshooting Your System."
Hard disk read failure		

I/O parity interrupt at <i>address</i>	Faulty or improperly installed expansion card.	See " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
Invalid configuration information - please run SETUP program	Incorrect configuration settings in System Setup program; NVRAM_CLR jumper is installed; faulty system battery.	Check the System Setup configuration settings. See "Using the System Setup Program" in the <i>User's Guide</i> . Remove the NVRAM_CLR jumper. See <a href="#">Figure A-2</a> for jumper location. If the problem persists, see " <a href="#">Troubleshooting the System Battery</a> " in "Troubleshooting Your System."
Invalid NVRAM configuration, resource re-allocated	System configuration data has been ignored.	Check the System Setup configuration settings. See "Using the System Setup Program" in the <i>User's Guide</i> .
Invalid SCSI configuration  SCSI cable detected on connector SC5IB of the SCSI backplane, daughter card not present	A SCSI cable is connected to the channel B connector on the SCSI backplane board; SCSI backplane daughter card is not installed.	If a cable is connected to the SC5IB backplane board connector, the SCSI backplane daughter card must be installed. Install the backplane daughter card. See " <a href="#">Installing a SCSI Backplane Daughter Card</a> " in "Installing Drives."
Keyboard controller failure	Faulty keyboard controller; faulty system board.	See " <a href="#">Getting Help</a> ."
Keyboard clock line failure	Loose or improperly connected keyboard cable; faulty keyboard; faulty keyboard controller.	See " <a href="#">Troubleshooting the Keyboard</a> " in "Troubleshooting Your System."
Keyboard data line failure		
Keyboard failure		
Keyboard stuck key failure		
Memory address line failure at <i>address</i> , read value expecting value	Faulty or improperly installed memory modules.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Memory double word logic failure at <i>address</i> , read value expecting value		
Memory high address line failure at <i>start address</i> to <i>end address</i>		
Memory high data line failure at <i>start address</i> to <i>end address</i>		
Memory odd/even logic failure at <i>start address</i> to <i>end address</i>		
Memory write/read failure at <i>address</i> , read value expecting value		
Memory parity failure at <i>start address</i> to <i>end address</i>	Faulty or improperly installed memory modules.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Memory parity error at <i>address</i>		
No boot device available	Faulty or missing optical/diskette drive subsystem, hard drive, or hard-drive subsystem.	Use a bootable diskette, CD, or hard drive. If the problem persists, see " <a href="#">Troubleshooting a Diskette Drive</a> ," " <a href="#">Troubleshooting an Optical Drive</a> ," and " <a href="#">Troubleshooting SCSI Hard Drives</a> " in "Troubleshooting Your System."
No boot sector on hard-disk	No operating system on hard drive.	Check the hard-drive configuration settings in the System Setup program. See "Using the System Setup Program" in the <i>User's Guide</i> .
No PXE-capable device available	<F12> pressed during POST and no PXE devices are detected.	Check the configuration settings in the System Setup program for the NICs. See "Using the System Setup Program" in the <i>User's Guide</i> . If the problem persists, see " <a href="#">Troubleshooting a NIC</a> " in "Troubleshooting Your System."
No timer tick interrupt	Faulty system board.	See " <a href="#">Getting Help</a> ."
Not a boot diskette	No operating system on 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. If the problem persists, see " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
PCIe Degraded Link Width Error: Embedded Bus# <i>nn</i> /Dev# <i>nn</i> /Func <i>n</i>  Expected Link Width is <i>n</i>  Actual Link Width is <i>n</i>	Faulty or improperly installed PCIe card or expansion-card cage.	Reseat the PCIe cards and the expansion-card cage. See " <a href="#">Expansion-Card Cage</a> " and " <a href="#">Expansion Cards</a> ." If the problem persists, see " <a href="#">Getting Help</a> ."
PCIe Degraded Link Width Error: Slot <i>n</i>  Expected Link Width is <i>n</i>  Actual Link Width is <i>n</i>	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See " <a href="#">Expansion Cards</a> ." If the problem persists, see " <a href="#">Getting Help</a> ."
PCIe Training Error: Embedded Bus# <i>nn</i> /Dev# <i>nn</i> /Func <i>n</i>	Faulty or improperly installed PCIe card or expansion-card cage.	Reseat the PCIe cards and the expansion-card cage. See " <a href="#">Expansion-Card Cage</a> " and " <a href="#">Expansion Cards</a> ." If the problem persists, see " <a href="#">Getting Help</a> ."
PCIe Training Error: Slot <i>n</i>	Faulty or improperly installed PCIe card in the specified slot number.	Reseat the PCIe card in the specified slot number. See " <a href="#">Expansion Cards</a> ." If the problem persists, see " <a href="#">Getting Help</a> ."
Plug & Play Configuration Error Embedded <i>xxx</i>	Error encountered in initializing PCI device; faulty system board.	Install the NVRAM_CLR jumper and reboot the system. See <a href="#">Figure A-2</a> for jumper location. If the problem persists, see " <a href="#">Troubleshooting Expansion Cards</a> " in "Troubleshooting Your System."
Plug & Play Configuration Error PCI_ <i>n</i>	Error encountered in initializing PCI adapter.	
Primary backplane is not present	Faulty or improperly installed SCSI backplane board.	See " <a href="#">Getting Help</a> ."

Processor n internal error	Faulty microprocessor; faulty system board.	See " <a href="#">Troubleshooting the Microprocessors</a> " in "Troubleshooting Your System."
Processor bus parity error		
Processor in socket 1 not installed!	No microprocessor installed in primary microprocessor socket.	Install a microprocessor in the primary microprocessor socket. See " <a href="#">Processors</a> " in "Installing System Options."
Remote access controller error	Embedded remote access memory may be temporarily corrupted.	To clear the embedded remote access memory, shut down the system, disconnect the power cords, wait approximately 30 seconds, reconnect the power cords, and restart the system. If the problem persists, see " <a href="#">Getting Help</a> ."
Remote access controller is not present		
SCSI cable not present on connector A or B of the primary backplane	SCSI cable is loose, improperly connected, or faulty.	Check the SCSI cable connection. If problem persists, add or replace SCSI cable. See " <a href="#">Getting Help</a> ."
Shutdown failure	Shutdown test failure.	See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Spare bank enabled	Memory spare bank enabled	You can enable memory spare bank using the System Setup program if the memory is configured to support this feature. For more information, see " <a href="#">General Memory Module Installation Guidelines</a> " in "Installing System Components," and Using the System Setup Program" in your <i>User's Guide</i> .
System backplane error	Faulty or improperly installed SCSI backplane board.	See " <a href="#">Getting Help</a> ."
System halted! Must power down	Wrong password entered too many times.	Information only.
The amount of system memory has changed	Memory has been added or removed or a memory module may be faulty.	If memory has been added or removed, this message is informative and can be ignored. If memory has not been added or removed, check the SEL to determine if single-bit or multi-bit errors were detected and replace the faulty memory module. See " <a href="#">Troubleshooting System Memory</a> " in "Troubleshooting Your System."
Time-of-day clock stopped	Faulty battery.	See " <a href="#">Troubleshooting the System Battery</a> " in "Troubleshooting Your System."
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 the <i>User's Guide</i> . If the problem persists, replace the system battery. See " <a href="#">Replacing the System Battery</a> " in "Installing System Options."
Timer chip counter 2 failed	Faulty system board.	See " <a href="#">Getting Help</a> ."
Unsupported CPU combination	Microprocessor(s) is not supported by the system.	Install a supported microprocessor combination. See " <a href="#">Processors</a> " in "Installing System Options."
Unsupported CPU stepping detected		
Unsupported DIMM detected in the RAID DIMM slot!	RAID memory module is not supported by the system.	Install a correct version of the RAID memory module. See " <a href="#">Activating the Integrated RAID Controller</a> " in "Installing Drives."
Unsupported RAID key detected!	RAID hardware key is not supported by the system.	Install the RAID hardware key for your specific system. See " <a href="#">Activating the Integrated RAID Controller</a> " in "Installing Drives."
Utility partition not available	The <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 <i>User's Guide</i> .
The VRM for the processor in socket n is not installed.	Specified microprocessor VRM is faulty, unsupported, improperly installed, or missing.	This message is not applicable to this system.
Warning: Detected mode change from RAID to SCSI x of the embedded RAID subsystem.	Type of controller has changed from optional RAID (when available) to SCSI since previous system boot.	Back up information on the hard drives before changing the type of controller used with the drives.
Warning: Detected mode change from SCSI to RAID x of the embedded RAID subsystem.	Type of controller has changed from SCSI to optional RAID (when available) since previous system boot.	Back up information on the hard drives before changing the type of controller used with the drives.
Warning: Detected missing RAID hardware for the embedded RAID subsystem. Data loss will occur! Press Y to switch mode to SCSI, press any other key to disable both channels. Press Y to confirm the change; press any other key to cancel.	Type of controller has changed since previous system boot.	Back up information on the hard drives before changing the type of controller used with the drives.
Warning: Firmware is out-of-date, please update.	Firmware error.	Update the firmware. See " <a href="#">Getting Help</a> ."
Warning! No microcode update loaded for processor X	BIOS error.	Update the BIOS firmware. See " <a href="#">Getting Help</a> ."
Write fault	Faulty diskette, optical/diskette drive assembly, hard drive, or hard-drive subsystem.	See " <a href="#">Troubleshooting a Diskette Drive</a> ," " <a href="#">Troubleshooting an Optical Drive</a> ," and " <a href="#">Troubleshooting SCSI Hard Drives</a> " in "Troubleshooting Your System."
Write fault on selected drive		
<b>NOTE:</b> For the full name of an abbreviation or acronym used in this table, see the "Glossary" in the <i>User's Guide</i> .		

## 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 2-10](#). 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."](#)

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

**Table 2-10. System Beep Codes**


Code	Cause	Corrective Action
1-1-2	CPU register test failure.	Replace microprocessor 1. See <a href="#">"Processors"</a> in "Installing System Board Options." If the problem persists, replace microprocessor 2.
1-1-3	CMOS write/read failure; faulty system board.	See <a href="#">"Getting Help."</a>
1-1-4	BIOS error.	Reflash the BIOS firmware. See <a href="#">"Getting Help."</a>
1-2-1	Programmable interval-timer failure; faulty system board.	See <a href="#">"Getting Help."</a>
1-2-2	DMA initialization failure.	See <a href="#">"Troubleshooting System Memory"</a> 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.	See <a href="#">"Getting Help."</a>
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.	See <a href="#">"Troubleshooting the Keyboard"</a> in "Troubleshooting Your System."
3-3-1	CMOS failure.	See <a href="#">"Getting Help."</a>
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.	
4-2-2	Shutdown test failure.	
4-2-3	Gate A20 failure.	
4-2-4	Unexpected interrupt in protected mode.	See <a href="#">"Troubleshooting Expansion Cards"</a> in "Troubleshooting Your System."
4-3-1	Improperly installed or faulty memory modules.	See <a href="#">"Troubleshooting System Memory"</a> in "Troubleshooting Your System."
4-3-2	No memory modules installed in bank 1.	Install memory modules in bank 1 of the same type and size. See <a href="#">"Installing Memory Modules"</a> in "Installing System Options."
4-3-3	Faulty system board.	See <a href="#">"Getting Help."</a>
4-3-4	Time-of-day clock stopped.	See <a href="#">"Troubleshooting the System Battery"</a> in "Troubleshooting Your System."
4-4-1	Super I/O chip failure; faulty system board.	See <a href="#">"Getting Help."</a>
4-4-2	BIOS-shadowing failure.	See <a href="#">"Troubleshooting System Memory"</a> in "Troubleshooting Your System."
4-4-3	Microprocessor speed control sequence failure.	See <a href="#">"Troubleshooting the Microprocessors"</a> in "Troubleshooting Your System."
4-4-4	Cache test failure; faulty microprocessor.	

**NOTE:** For the full name of an abbreviation or acronym used in this table, see the "Glossary" in the *User's Guide*.

---

## 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.

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## Finding Software Solutions

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Before You Begin](#)
- [Troubleshooting Errors and Conflicts](#)

Software problems can be caused by:

- 1 Improper installation or configuration of an application
- 1 Application conflicts
- 1 Input errors
- 1 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

- 1 Scan the software media with antivirus software.
- 1 Read the software documentation before you run the installation utility.
- 1 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 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. [Table 3-1](#) lists the IRQ assignment defaults.

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

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## Running System Diagnostics

Dell™ PowerEdge™ 2850 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 Advanced Testing Options](#)
- [Error Messages](#)

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:

- 1 Run tests individually or collectively.
  - 1 Control the sequence of tests.
  - 1 Repeat tests.
  - 1 Display, print, or save test results.
  - 1 Temporarily suspend testing if an error is detected or terminate testing when a user-defined error limit is reached.
  - 1 View help messages that briefly describe each test and its parameters.
  - 1 View status messages that inform you if tests are completed successfully.
  - 1 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 can be run either from the utility partition on your hard drive or from a set of diskettes that you create using the *Dell OpenManage Server Assistant* CD.

- ➡ **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).

#### From the Utility Partition

1. As the system boots, press <F10> during POST.
2. From the utility partition main menu under **Run System Utilities**, select **Run System Diagnostics**.

#### From the Diagnostics Diskettes

1. Create a set of diagnostics diskettes from the *Dell OpenManage Server Assistant* CD. See "Using the Dell OpenManage Server Assistant CD" in your *User's Guide* for information on creating the diskettes.
2. Insert the first diagnostics diskette.
3. Reboot the system.

If the system fails to boot, see "[Getting Help](#)."

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

To select an option from the **Diagnostics** menu, highlight the option and press <Enter>, or press the key that corresponds to the highlighted letter in the option.

[Table 4-1](#) provides a brief explanation of testing options.

**Table 4-1. System Diagnostics Testing Options**

Testing Option	Function
Quick Tests	Performs a quick check of the system. Select <b>Test All Devices</b> and then select <b>Quick Tests</b> . This option runs device tests that do not require user interaction. Use this option to quickly identify the source of your problem.
Test One Device	Tests a particular device.
Extended Tests	Performs a more thorough check of the system. Select <b>Test All Devices</b> and then select <b>Extended Tests</b> .
Advanced Testing	Checks a particular area of the system.
Information and Results	Displays test results.
Program Options	Sets various test parameters.
Device Configuration	Displays an overview of the devices in the system.
Exit to MS-DOS	Exits the diagnostics and returns to the <b>System Utilities</b> menu.

## Using the Advanced Testing Options

When you select **Advanced Testing** from the **Diagnostics** menu, the main screen of the diagnostics appears and displays the following information:

- 1 Two lines at the top of the screen identify the diagnostics utility, the version number, and the system's service tag number.
- 1 The left side of the screen under **Device Groups** lists the diagnostic device groups in the order that they are tested if you select **All** under the **Run Tests** submenu. Press the up- or down-arrow keys to highlight a particular device group. Press the left- or right-arrow keys to select the options on the menu. As you move from one menu option to another, a brief explanation of the highlighted option appears at the bottom of the screen.
- 1 The right side of the screen under **Devices for Highlighted Group** lists the specific devices within a particular test group.
- 1 The menu area consists of two lines at the bottom of the screen. The first line lists the menu options that you can select; press the left- or right-arrow key to highlight an option. The second line provides information about the highlighted option.

For more information about a device group or device, highlight the Help option and press <Enter>. Press <Esc> to return to the previous screen.

## Error Messages

When you run a system diagnostics test, you may receive an error message during testing. Record the message on a copy of the Diagnostics Checklist. For a copy of the Diagnostics Checklist and instructions for obtaining technical assistance, see "[Getting Help](#)."

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## Troubleshooting Your System

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [Safety First—For You and Your System](#)
- [Start-Up Routine](#)
- [Checking the Equipment](#)
- [Troubleshooting External Connections](#)
- [Troubleshooting Basic I/O Functions](#)
- [Troubleshooting a NIC](#)
- [Responding to a Systems Management Software Alert Message](#)
- [Inside the System](#)
- [Troubleshooting a Wet System](#)
- [Troubleshooting a Damaged System](#)
- [Troubleshooting the System Battery](#)
- [Troubleshooting Power Supplies](#)
- [Troubleshooting System Cooling Problems](#)
- [Troubleshooting System Memory](#)
- [Troubleshooting a Diskette Drive](#)
- [Troubleshooting an Optical Drive](#)
- [Troubleshooting an External SCSI Tape Drive](#)
- [Troubleshooting SCSI Hard Drives](#)
- [Troubleshooting an Integrated RAID Controller](#)
- [Troubleshooting a RAID Controller Card](#)
- [Troubleshooting Expansion Cards](#)
- [Troubleshooting the Microprocessors](#)

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

---

## 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](#) for the front-panel connectors on your system and [Figure 2-3](#) for the back-panel connectors.

---

## Troubleshooting the Video Subsystem

### Problem

- 1 Monitor is not working properly.
- 1 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

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

### Action

1. Ensure that the keyboard is properly connected to the system.
2. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
3. Press each key on the keyboard, and examine the keyboard and its cable for signs of damage.
4. 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

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

### Action

1. Ensure that the mouse is properly connected to the system.
2. Run the appropriate online diagnostic test. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."

If the test fails, continue to the next step.

3. 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.

4. Swap the faulty mouse with a working mouse.

If the problem is resolved, replace the faulty mouse. See "[Getting Help](#)."

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

If the problem is not resolved, see "[Getting Help](#)."

---

## Troubleshooting Basic I/O Functions

### Problem

1. Error message indicates a problem with the serial port.
1. Device connected to the 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

1. 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

1. System message indicates a problem with a USB device.
1. 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.
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 interface cable. See "[Getting Help](#)."

If the problem is resolved, replace the USB device. See "[Getting Help](#)."

If the problem persists, see "[Getting Help](#)."

---

## Troubleshooting a NIC

### Problem

1. 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 "[NIC Indicator Codes](#)" in "Indicators, Messages, and Codes."
  1. If the link indicator does not light, check all cable connections.
  1. 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.
  1. Change the autonegotiation setting, if possible.
  1. 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 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.

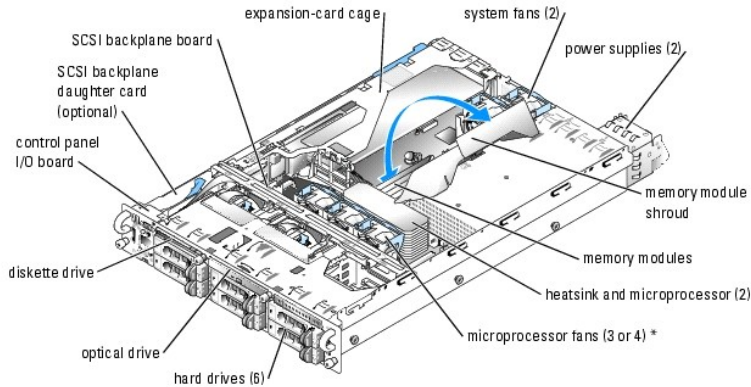
---

## Inside the System

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

In [Figure 5-1](#), the covers and bezel are removed to provide an interior view of the system.

**Figure 5-1. Inside the System**



\* single-processor systems require three front fans; dual-processor systems require four front fans

The system board holds the system's control circuitry and other electronic components. Several hardware options, such as the microprocessors and memory, are installed directly on the system board. The expansion-card cage accommodates up to three full-length PCI, PCIe, or PCI-X expansion cards.

The system provides space for a 3.5-inch diskette drive and an optical drive. The optical drive and the diskette drive trays connect to the controllers on the system board through the SCSI backplane board. For more information, see "[Installing Drives.](#)"

The hard-drive bays provide space for up to six 1-inch SCSI hard drives. The hard drives connect to a controller on the system board or a RAID controller card through the SCSI backplane board. For more information, see "[Installing Drives.](#)"

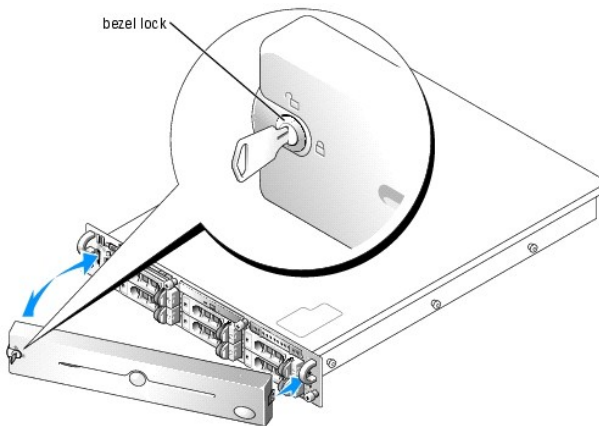
During an installation or troubleshooting procedure, you may be required to change a jumper setting. For more information, see "[Jumpers and Connectors.](#)"

## Removing the Bezel

The bezel has a system status indicator. A lock on the bezel restricts access to the power button, diskette drive, optical drive, hard drive(s), and the interior of the system.

1. Using the system key, unlock the bezel.
2. Press the tab at the left end of the bezel.
3. Rotate the left end of the bezel away from the system to release the right end of the bezel.
4. Pull the bezel away from the system. See [Figure 5-2](#).

**Figure 5-2. Removing the Bezel**



## Replacing the Bezel



1. Fit the tabs on the right end of the bezel into the corresponding slots in the front panel.
2. Rotate the left end of the bezel toward the system to secure the left end of the bezel.
3. Using the system key, lock the bezel.

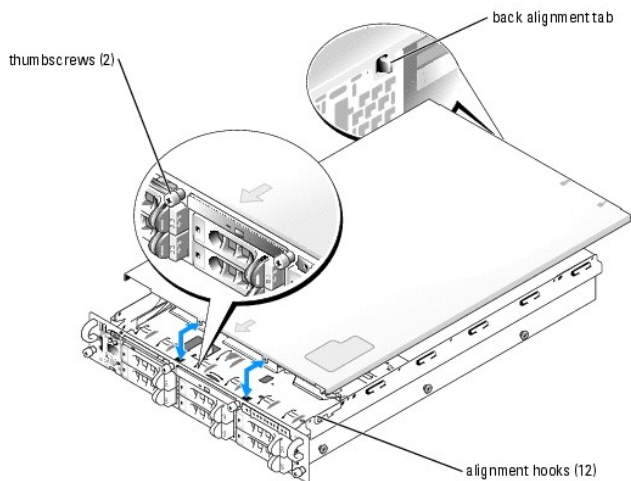
## Opening the System

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

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

1. Remove the bezel. See "[Removing the Bezel](#)."
2. Loosen the two thumbscrews that secure the cover to the chassis. See [Figure 5-3](#).
3. Slide the top cover backward and grasp the cover at both sides.
4. Carefully lift the cover away from the system.

Figure 5-3. Removing the Cover



## Closing the System

1. Ensure that no tools or parts are left inside the system and that any cables are routed so that they will not be damaged by the cover.
2. Align the cover with the cover alignment hooks on the sides of the chassis, and slide the cover forward. See [Figure 5-3](#).  
When the cover is properly closed, the back alignment tab protrudes from the slot on the back of the cover.
3. Tighten the two thumbscrews that secure the cover to the chassis.
4. Replace the bezel. See "[Replacing the Bezel](#)."

---

## Troubleshooting a Wet System

### Problem

1. Liquid spilled on the system.

- 1 Excessive humidity.

#### Action

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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 Options."
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 Options."
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

- 1 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. 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:
  - 1 Expansion cards
  - 1 Power supplies
  - 1 Fans
  - 1 Drive-carrier connections to the SCSI backplane board, if applicable

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 System Diagnostics](#)."

If the tests fail, see "[Troubleshooting Your System](#)."

---

## Troubleshooting the System Battery

### Problem

- 1 System message indicates a problem with the battery.
- 1 System Setup program loses system configuration information.
- 1 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 Options."

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 Power Supplies


### Problem

- 1 System-status indicators are amber.
- 1 Power-supply fault indicators are amber.
- 1 Front-panel status LCD indicates a problem with the power supply.


### Action

1. Run the appropriate online diagnostics test. See "[Using Server Administrator Diagnostics](#)" in "Running the System Diagnostics."
2. Locate the faulty power supply.

The power supply's fault indicator is lit. See "[Redundant Power-Supply Indicator Codes](#)" in "Indicators, Messages, and Codes."

 **NOTE:** You can hot-plug the power supplies. One power supply must be installed for the system to operate. The system is in the redundant mode when two power supplies are installed. Remove and install only one power supply at a time in a system that is powered on. Operating the system with only one power supply installed and without a power supply blank installed for extended periods of time can cause the system to overheat.

3. Ensure that the power supply is properly installed by removing and reinstalling it. See "[Power Supplies](#)" in "Installing System Options."

 **NOTE:** After installing a power supply, allow several seconds for the system to recognize the power supply and to determine if it is working properly. The power indicator turns green to signify that the power supply is functioning properly. See "[Redundant Power-Supply Indicator Codes](#)" in "Indicators, Messages, and Codes."

4. If reseating the power supply did not resolve the problem, remove the faulty power supply. See "[Removing a Power Supply](#)" in "Installing System Options."
5. Install a new power supply. See "[Replacing a Power Supply](#)" in "Installing System Options."

If the problem persists, see "[Getting Help](#)."

---

## Troubleshooting System Cooling Problems

### Problem

- 1 Systems management software issues a fan-related error message.

### Action

Ensure that none of the following conditions exist:


- 1 Ambient temperature is too high.
- 1 External airflow is obstructed.
- 1 Cables inside the system obstruct airflow.
- 1 An individual cooling fan has failed. See "[Troubleshooting a Fan](#)."

## Troubleshooting a Fan

### Problem

- 1 System-status indicator is amber.
- 1 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. 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](#)."

 **CAUTION:** The cooling fans are hot-pluggable. To maintain proper cooling while the system is on, only replace one fan at a time.

3. Ensure that the faulty fan is properly seated in its connector and that its handle is closed. See "[System Fans](#)" in "Installing System Options."

 **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 "[System Fans](#)" in "Installing System Options."

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

- 1 Faulty memory module.
- 1 Faulty system board.
- 1 Front-panel status LCD indicates a problem with system memory.

### Action

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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 "[Removing the Bezel](#)."
  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 "[Installing Memory Modules](#)" in "Installing System Options."  
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 Options."
  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](#)."

 **NOTE:** Several configurations for the memory modules exist; see "[Installing Memory Modules](#)" in "Installing System Options."


    - c. Swap the memory modules in bank 1 with a working pair of modules of the same size, speed, and rank. See "[Installing Memory Modules](#)" in "Installing System Options."
    - 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 a Diskette Drive

### Problem

1. Error message indicates a diskette drive problem.

### Action

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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 drive is configured correctly. See "Using the System Setup Program" in the *User's Guide*.


2. Open or remove the bezel. See "[Removing the Bezel](#)."
  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 diskette drive interface cable is securely connected to the diskette drive and the system board.
  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.
  10. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.
  11. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.
  12. Open the system. See "[Opening the System](#)."
  13. Remove all expansion cards installed in the system. See "[Removing an Expansion Card](#)" in "Installing System Options."
  14. Close the system. See "[Closing the System](#)."
  15. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
  16. 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](#)."
  17. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
  18. Open the system. See "[Opening the System](#)."
  19. Reinstall one of the expansion cards you removed in [step 13](#). See "[Installing an Expansion Card](#)" in "Installing System Options."
  20. Close the system. See "[Closing the System](#)."
  21. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
  22. Run the appropriate online diagnostic test to see whether the diskette drive works correctly.
  23. Repeat [step 17](#) through [step 23](#) 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

- 1 System cannot read data from a CD in an optical drive.
- 1 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. 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 or SCSI 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 or remove the bezel. See "[Removing the Bezel](#)."
  6. Turn off the system and attached peripherals, and disconnect the system from the electrical
  7. Open the system. See "[Opening the System](#)."
  8. Ensure that the optical-drive interface cable is securely connected to the optical drive and to the controller.
  9. Ensure that a 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 is not resolved, see "[Getting Help](#)."
- 

## Troubleshooting an External SCSI Tape Drive

### Problem

1. Defective tape drive
1. Defective tape cartridge
1. Missing or corrupted tape-backup software or tape drive device driver
1. Defective SCSI controller

### Action

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Remove the tape cartridge you were using when the problem occurred, and replace it with a tape cartridge that you know works.
2. Ensure that the SCSI device drivers for the tape drive are installed and are configured correctly. See the documentation that came with your tape drive.
3. Reinstall the tape-backup software as instructed in the tape-backup software documentation.
4. Ensure that the tape drive's interface/DC power cable is connected to the tape drive and SCSI controller card.
5. 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.
6. Run the appropriate online diagnostics tests. See "[Using Server Administrator Diagnostics](#)" in "Running System Diagnostics."
7. Open or remove the bezel. See "[Removing the Bezel](#)."
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. Ensure that the SCSI controller card is firmly seated in its connector. See "[Installing an Expansion Card](#)" in "Installing System Options."

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 SCSI Hard Drive (System With a SCSI Backplane)

#### Problem

- 1 Device driver error.
- 1 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. 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 documentation.

If the tests fail, continue to the next step.

2. If the integrated SCSI host adapter controls the SCSI hard drives, restart the system and press <Ctrl><a> to enter the SCSI configuration utility program.

 **NOTE:** If your system has an optional RAID controller card installed, restart the system and 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. Verify that the device drivers are installed and configured correctly. See the operating system documentation.
5. Remove the hard drive and install it in another drive bay.
6. If the problem is resolved, reinstall the hard drive in the original bay. See "[Installing a SCSI Hard Drive](#)" 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 "[Installing a SCSI Hard Drive](#)" in "Installing Drives."

If the problem persists, the SCSI backplane board has a defective connector. See "[Getting Help.](#)"

7. 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. Verify that the SCSI cable is securely connected to the SCSI host adapter.

The SCSI cable may be connected to the SCSI host adapter on the system board or to a SCSI host adapter card installed in an expansion slot.

- d. Close the system. See "[Closing the System.](#)"
8. Format and partition the hard drive. See the operating system documentation.
  9. If possible, restore the files to the drive.



If the problem persists, see "[Getting Help](#)."

---

## Troubleshooting an Integrated RAID Controller

### Problem

- 1 Error message indicates an integrated RAID controller problem.

### Action

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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. Enter the System Setup program and ensure that the integrated RAID controller is enabled. See "Using the System Setup Program" in your *User's Guide*.
3. Ensure that the RAID controller is configured properly. See the RAID documentation for information about configuration settings.

If the problem is not resolved, continue to the next step.

4. Remove the bezel. See "[Removing the Bezel](#)."
5. Turn off the system and attached peripherals, and disconnect the system from its electrical outlet.
6. Open the system. See "[Opening the System](#)."
7. Ensure that the following RAID components are properly installed:
  - 1 Memory module
  - 1 Hardware key
  - 1 Battery

See "[Activating the Integrated RAID Controller](#)" in "Installing Drives."

8. Close the system. See "[Closing the System](#)."
9. Reconnect the system to its electrical outlet, and turn on the system and attached peripherals.

If the problem is not resolved, continue to the next 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](#)."

**⚠ CAUTION:** Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See the *Product Information Guide* for more information.

12. Replace the RAID battery. See "[Activating the Integrated RAID Controller](#)" in "Installing Drives."
13. Close the system. See "[Closing the System](#)."
14. Reconnect the system to its 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

- 1 Error message indicates a RAID controller problem.
- 1 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. 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 "[Removing the Bezel](#)."
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 a RAID Controller Card](#)" in "Installing System Options."
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 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

- 1 Error message indicates a problem with an expansion card.
- 1 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. 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. Open or remove the bezel. See "[Removing the Bezel](#)."
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 each expansion card is firmly seated in its connector. See "[Installing an Expansion Card](#)" in "Installing System Options."
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, go 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. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Options."
  11. Close the system. See "[Closing the System.](#)"
  12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
  13. Run the appropriate online diagnostic test.  
If the tests fail, see "[Getting Help.](#)"
  14. For each expansion card you removed in [step 10](#), 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 Microprocessors

### Problem

- 1 Error message indicates a processor problem.
- 1 Front-panel status LCD indicates a problem with the processors or system board.
- 1 A heat sink is not installed for each processor.

### Action

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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 each processor and heat sink are properly installed. See "[Processors](#)" in "Installing System Options."
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. Remove processor 2, leaving only processor 1 installed. See "[Processors](#)" in "Installing System Options."  
To locate the processors, see [Figure A-3](#).  
If only one processor is installed, see "[Getting Help.](#)"

11. Close the system. See "[Closing the System](#)."
  12. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
  13. Run the appropriate online diagnostic test.  
If the tests complete successfully, go to [step 19](#).
  14. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
  15. Open the system. See "[Opening the System](#)."
  16. Replace processor 1 with another processor of the same capacity. See "[Processors](#)" in "Installing System Options."
  17. Close the system. See "[Closing the System](#)."
  18. Run the appropriate online diagnostic test.  
If the tests complete successfully, replace processor 1. See "[Getting Help](#)."
  19. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
  20. Open the system. See "[Opening the System](#)."
  21. Reinstall the processors that you removed in [step 10](#). See "[Processors](#)" in "Installing System Options."
  22. Close the system. See "[Closing the System](#)."
  23. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.  
If the problem persists, see "[Getting Help](#)."
- 

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## Installing System Options

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [System Fans](#)
- [Power Supplies](#)
- [Expansion-Card Cage](#)
- [Expansion Cards](#)
- [System Memory](#)
- [Processors](#)
- [System Battery](#)
- [Installing an Optional RAC Card](#)

This section describes how to remove and replace the following components:

- 1 Expansion cards
- 1 Memory upgrades
- 1 Microprocessor upgrades
- 1 RAC card

This section also includes instructions for replacing the fans, power supplies, and system battery, if necessary.

---

## System Fans

The system includes the following hot-pluggable cooling fans:

- 1 Two rear system fans
- 1 Three front fans for one microprocessor or four front fans for two microprocessors

## Removing a Cooling Fan

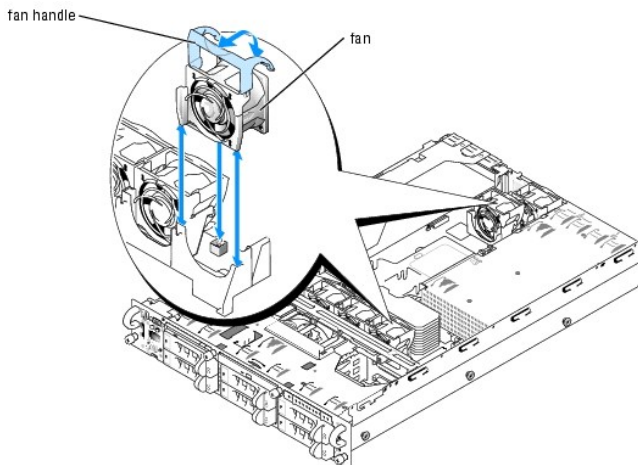
**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

**🔧 NOTE:** The procedure for removing each individual fan is the same.

**🔄 NOTICE:** The cooling fans are hot-pluggable. To maintain proper cooling while the system is on, replace only one fan at a time.

1. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
2. Raise the fan handle and pull the fan straight up to clear the chassis. See [Figure 6-1](#).

Figure 6-1. Removing and Installing a Cooling Fan



## Replacing a Cooling Fan

**NOTE:** The procedure for installing each individual fan is the same.

1. Ensure that the fan handle is upright and lower the fan into its retention base until the fan is fully seated. Then lower the fan handle until it snaps into place. See [Figure 6-1](#).
  2. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
- 

## Power Supplies

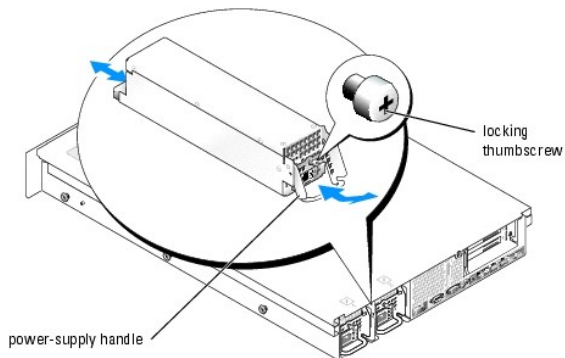
The system is available with optional two hot-pluggable power supplies.

### Removing a Power Supply

**NOTICE:** The power supplies are hot-pluggable. The system requires one power supply to be installed for the system to operate normally. The system is in the redundant mode when two power supplies are installed. Remove and replace only one power supply at a time in a system that is powered on.

1. Loosen the locking thumbscrew.
2. Rotate the power-supply handle up until the power supply is released from the chassis. See [Figure 6-2](#).
3. Pull the power supply straight out to clear the chassis. See [Figure 6-2](#).

**Figure 6-2. Removing and Installing a Power Supply**



### Replacing a Power Supply

1. With the power-supply handle in the extended position, slide the new power supply into the chassis. See [Figure 6-2](#).
2. Rotate the handle down until it is completely flush with the power-supply faceplate, and then tighten the locking thumbscrew. See [Figure 6-2](#).

**NOTE:** After installing a new power supply, allow several seconds for the system to recognize the power supply and determine whether it is working properly. The power-on indicator will turn green to signify that the power supply is functioning properly. See [Figure 2-4](#).

---

## Expansion-Card Cage

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

### Removing the Expansion-Card Cage

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

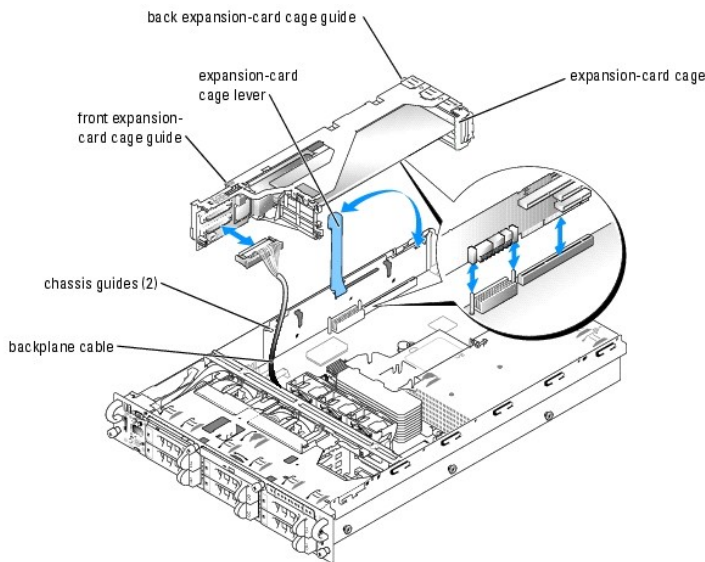
1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Disconnect all expansion-card cables.
4. Rotate the expansion-card cage lever up to a 90-degree angle until the cage is released from the chassis. See [Figure 6-3](#).

**🔍 NOTE:** The expansion-card cage lever pauses at a 45-degree angle, but is not unlocked. Continue rotating the lever to a 90-degree angle to unlock the cage.

5. Lift the cage straight up to clear the chassis. See [Figure 6-3](#).
6. Disconnect the backplane cable(s) from the riser board.

**🕒 NOTICE:** If two SCSI data cables are connected to the riser card, carefully note their relative locations so that you can reinstall them correctly.

**Figure 6-3. Removing and Installing the Expansion-Card Cage**



## Replacing the Expansion-Card Cage

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Reconnect the backplane cable(s) to the riser board.
  2. With the expansion-card cage lever rotated to a 90-degree angle, align the guides on each end of the expansion-card cage with the guides on the chassis wall, and lower the cage. See [Figure 6-3](#).
  3. Rotate the expansion-card cage lever down until the handle is flush with the top of the cage to secure the cage in the chassis. See [Figure 6-3](#).
  4. Reconnect all expansion-card cables.
  5. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
-


## Expansion Cards

The system is available with a PCI-X riser board or an optional PCI-X/PCI Express (PCIe) riser board. The PCI-X riser board provides three PCI-X expansion slots and the PCI-X/PCIe riser board provides one PCI-X expansion slot, one PCIe x4-lane expansion slot, and one PCIe x8-lane expansion slot.

## Expansion Card Installation Guidelines

### PCI-X Riser Board Expansion Slots

Slot 1 and slot 2 share the same bus. Slot 3 is on a separate bus. You can install expansion cards of different operating speeds on the same bus; however, the bus will operate at the slowest operating speed of the cards on that bus. For example, if one card on the bus has an operating speed of 66 MHz and the other card has an operating speed of 100 MHz, the bus can operate only at 66 MHz. Also, if a PCI card is installed on the same bus with a PCI-X card, the bus runs in PCI mode.

 **NOTE:** The expansion-card slots are not hot-pluggable.

To identify expansion slots, see [Figure A-4](#), [Table 6-1](#) lists the operating speed for the PCI-X riser board expansion-card slots.


**Table 6-1. PCI-X Riser Board Expansion Slot Speeds**


Slot	Operating Speed
1	33, 66, 100, or 133 MHz
2	33, 66, 100, or 133 MHz
3	33, 66, 100, or 133 MHz

**NOTE:** Slot 3 supports half-length expansion cards only.

### Optional PCI-X/PCIe Riser Board Expansion Slots

The optional PCI-X/PCIe riser board provides one PCIe x4-lane slot, one PCIe x8-lane slot, and one PCI-X 100-MHz slot.

 **NOTE:** Although the PCIe x4-lane expansion slot is physically a PCIe x8 connector, it functions only as a PCIe x4-lane slot.

 **NOTE:** The expansion-card slots are not hot-pluggable.


To identify expansion slots, see [Figure A-5](#), [Table 6-2](#) lists the PCI bus and operating speed for the optional PCI-X/PCI-e riser board expansion-card slots. The three expansion card slots are on separate buses.

**Table 6-2. Optional PCI-X/PCIe Riser Board Expansion Slot Speeds**

Slot	Operating Speed
1	2GB per second
2	4GB per second
3	33, 66, or 100 MHz

**NOTE:** Slot 3 supports half-length expansion cards only.

## Installing an Expansion Card

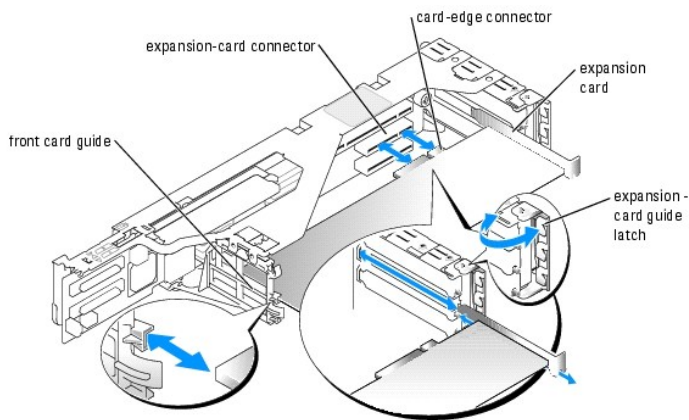
 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

1. Unpack the expansion card and prepare it for installation.  
For instructions, see the documentation accompanying the card.
2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."



4. Disconnect all expansion-card cables.
5. Remove the expansion-card cage. See ["Removing the Expansion-Card Cage."](#)
6. Position the expansion-card cage so that the riser board lies horizontally or vertically on your work surface.  
  
**NOTE:** The horizontal or vertical orientation of the riser board depends on the type of card that you are installing. The horizontal orientation of the riser board shown in [Figure 6-4](#) is for reference only.
7. Open the expansion-card guide latch and remove the filler bracket. See [Figure 6-4](#).
8. Install the expansion card:
  - a. If the expansion card is full length, align its front edge with the front card guide. See [Figure 6-4](#).
  - b. Position the expansion card so that the card-edge connector aligns with the expansion-card connector on the expansion-card riser board.
  - c. Insert the card-edge connector firmly into the expansion-card connector until the card is fully seated.
  - d. When the card is seated in the connector, close the expansion-card latch. See [Figure 6-4](#).

**Figure 6-4. Installing an Expansion Card**



9. Replace the expansion-card cage. See ["Replacing the Expansion-Card Cage."](#)
10. Reconnect all expansion-card cables, including those for the new card.  
  
See the documentation that came with the card for information about its cable connections.

**NOTE:** If the expansion card you are installing is of a different operating speed as the card already installed on the same PCI bus, all expansion cards on that bus will operate at the slower speed.


11. Close the system. See ["Closing the System"](#) in ["Troubleshooting Your System."](#)

## 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. 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. Open the system. See ["Opening the System"](#) in ["Troubleshooting Your System."](#)
3. Disconnect all expansion-card cables.
4. Remove the expansion-card cage. See ["Removing the Expansion-Card Cage."](#)
5. Position the expansion-card cage so that the riser board lies horizontally on your work surface.
6. Release the expansion card:

- a. Open the expansion-card latch. See [Figure 6-4](#).
  - b. Grasp the expansion card by its top corners, and carefully remove it from the expansion- card connector.
7. If you are removing the card permanently, install a metal filler bracket over the empty expansion slot opening and close the expansion-card latch.

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

8. Replace the expansion-card cage. See "[Replacing the Expansion-Card Cage](#)."
9. Reconnect all expansion-card cables.
10. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."


---

## System Memory

The six memory module sockets can accommodate from 256 MB to 16GB of registered ECC PC2-3200 (DDR 2 400) memory. The memory sockets are located on the system board under the memory module shroud adjacent to the power supply bays. See [Figure A-3](#).

You can upgrade the system memory by installing combinations of 256-, 512-MB, 1-GB, 2-GB, and 4-GB (when available) registered memory modules. You can purchase memory upgrade kits from Dell.

 **NOTE:** The memory modules must be PC2-3200 compliant.

 **NOTICE:** If you remove your original memory modules from the system during a memory upgrade, keep them separate from any new memory modules that you may have, even if you purchased the new memory modules from Dell. Use only registered ECC DDR II memory modules.

The memory module sockets are arranged in three banks on two channels (A and B). The memory module banks are identified as follows:

- 1 Bank 1: DIMM1\_A and DIMM1\_B
- 1 Bank 2: DIMM2\_A and DIMM2\_B
- 1 Bank 3: DIMM3\_A and DIMM3\_B

## General Memory Module Installation Guidelines

- 1 If only one memory module is installed, it must be a 256 MB module installed in socket DIMM\_1A.
- 1 If two or more memory modules are installed, they must be installed in pairs of matched memory size, speed, and technology.
- 1 The system supports both single-ranked and dual-ranked memory modules.

Memory modules marked with a 1R are single ranked and modules marked with a 2R are dual ranked.

- 1 If you install both single-ranked and dual -ranked memory modules, the dual-ranked memory modules must be installed in bank 1, regardless of capacity.

 **NOTE:** Dual-rank memory modules with less capacity take precedence over single-ranked memory modules with greater capacity.

- 1 If bank 2 contains dual-ranked memory modules, then bank 3 must be unpopulated.
- 1 Dual-ranked memory modules are not supported in bank 3.

## Spare Bank Support

If six memory modules of the same size are installed, the memory modules in bank 3 (DIMM3\_A and DIMM3\_B) can function as a spare bank. The following restrictions apply when configuring memory for spare bank support:

- 1 All six memory modules must be single-rank modules.
- 1 All six memory modules must have the same capacity.

## Memory Mirroring Support

The system supports memory mirroring if identical memory modules are installed in bank 1 and bank 2, and no memory modules are installed in bank 3.

[Table 6-3](#) and [Table 6-4](#) show examples of different memory configurations. [Table 6-4](#) lists the various allowable combinations of single- and dual-ranked memory modules

**Table 6-3. Sample Memory Configurations**

Total Memory	DIMM_1A	DIMM_1B	DIMM_2A	DIMM_2B	DIMM_3A	DIMM_3B
256 MB	256 MB	none	none	none	none	none
1 GB	256 MB	256 MB	256 MB	256 MB	none	none
1 GB	512 MB	512 MB	none	none	none	none
2 GB	512 MB	512 MB	512 MB	512 MB	none	none
2 GB	1 GB	1 GB	none	none	none	none
3 GB	1 GB	1 GB	512 MB	512 MB	none	none
3 GB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
4 GB	1 GB	1 GB	1 GB	1 GB	none	none
4 GB	1 GB	1 GB	512 MB	512 MB	512 MB	512 MB
6 GB	2 GB	2 GB	1 GB	1 GB	none	none
6 GB	1 GB	1 GB	1 GB	1 GB	1 GB	1 GB
8 GB	2 GB	2 GB	2 GB	2 GB	none	none
8 GB	4 GB	4 GB	none	none	none	none
12 GB	2 GB	2 GB	2 GB	2 GB	2 GB	2 GB
16 GB	4 GB	4 GB	4 GB	4 GB	none	none

Table 6-4. Allowable Memory Module Configurations – Single-Ranked and Dual-Ranked Memory Modules

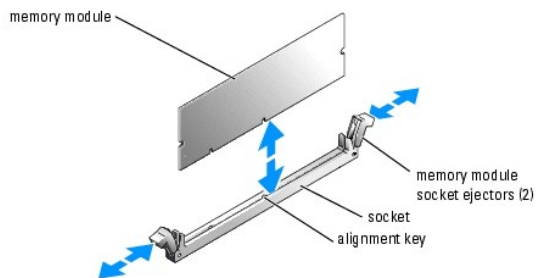
DIMM1_A	DIMM1_B	DIMM2_A	DIMM2_B	DIMM3_A	DIMM3_B
Single Rank	none	none	none	none	none
Single Rank	Single Rank	none	none	none	none
Dual Rank	Dual Rank	none	none	none	none
Single Rank	Single Rank	Single Rank	Single Rank	none	none
Dual Rank	Dual Rank	Dual Rank	Dual Rank	none	none
Dual Rank	Dual Rank	Single Rank	Single Rank	none	none
Single Rank	Single Rank	Single Rank	Single Rank	Single Rank	Single Rank
Dual Rank	Dual Rank	Single Rank	Single Rank	Single Rank	Single Rank

## Installing Memory Modules


**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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. Lift up the memory module shroud.
3. Locate the memory module sockets. See [Figure A-3](#).
4. Press the ejectors on the memory module socket down and out, as shown in [Figure 6-5](#), to allow the memory module to be inserted into the socket.

Figure 6-5. Installing and Removing a Memory Module



5. Align the memory module's edge connector with the alignment key of 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.

6. 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.

7. Repeat [step 3](#) through [step 6](#) of this procedure to install the remaining memory modules. See [Table 6-3](#) and [Table 6-4](#) for sample memory configurations.
8. Lower the memory module shroud.
9. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
10. 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.
11. If the value is incorrect, one or more of the memory modules may not be installed properly. Repeat [step 1](#) through [step 10](#) of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.
12. Run the system memory test in the system diagnostics. See "[Running System Diagnostics](#)."

## Removing Memory Modules

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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. Lift up the memory module shroud.
  3. Locate the memory module sockets. See [Figure A-3](#).
  4. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket. See [Figure 6-5](#).
  5. Lower the memory module shroud.
  6. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
- 


## Processors

It is possible to upgrade your processor(s) to take advantage of future options in speed and functionality. Each 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.

The following items are included in the processor upgrade kit:

- 1 Processor
- 1 Heat sink
- 1 Front fan

## Replacing the Processor

 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

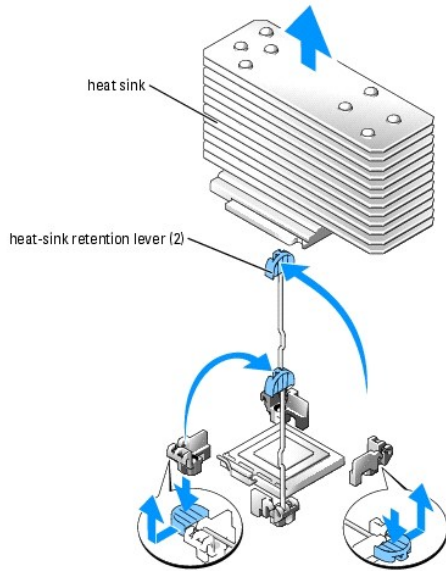
1. Open the system. See "[Opening the System](#)" in Troubleshooting Your System."
2. Lift up and remove the memory module shroud.

➡ **NOTICE:** The processor and heat sink can become extremely hot. Be sure the processor has had sufficient time to cool before handling.

3. Press the tab on the end of one of the heat-sink retention levers to disengage the lever, then lift the lever 90 degrees. See [Figure 6-6](#).

➡ **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.

**Figure 6-6. Installing and Removing the Heat Sink**



⚠ **NOTE:** When removing 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.

4. Wait 30 seconds for the heat sink to loosen from the processor.

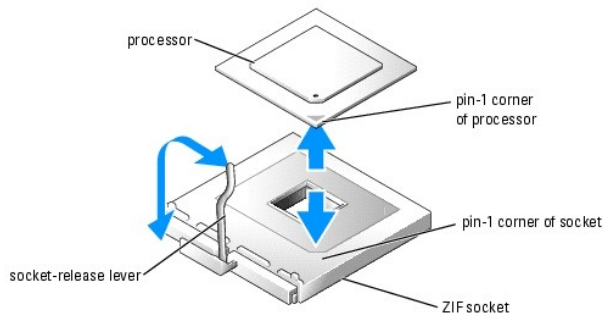
5. Repeat [step 3](#) to open the other heat sink retention lever.

6. Remove the heat sink.

- If the processor is removed from the socket with the heat sink, twist or slide the processor off of the heat sink. Do not pry the processor off of the heat sink.
- Set the heat sink upside down so as not to contaminate the thermal grease.

7. Pull the socket-release lever straight up until the processor is released from the socket. See [Figure 6-7](#).

**Figure 6-7. Installing and Removing the Processor**



8. Lift the processor out of the socket and leave the release lever up so that the socket is ready for the new processor.

➡ **NOTICE:** Be careful not to bend any of the pins when removing the processor. Bending the pins can permanently damage the processor.

9. Unpack the new processor.


If any of the pins on the processor appear bent, see "[Getting Help](#)."

10. Align the pin-1 corner of the processor with the pin-1 corner of the ZIF socket. See [Figure 6-7](#).

 **NOTE:** Identifying the pin-1 corners is critical to positioning the processor correctly.

Identify the pin-1 corner of the processor by locating the tiny gold triangle on one corner of the processor. Place this corner in the same corner of the ZIF socket identified by a corresponding triangle.

11. Install the processor in the socket.

 **NOTICE:** Positioning the processor incorrectly can permanently damage the processor and the system when you turn it on. When placing the processor in the socket, be sure that all of the pins on the processor enter the corresponding holes. Be careful not to bend the pins.

- a. If the release lever on the processor socket is not positioned all the way up, move it to that position.
- b. With the pin-1 corners of the processor and socket aligned, set the processor lightly in the socket, making sure all pins are matched with the correct holes in the socket.


Because the system uses a ZIF processor socket, do not use force, which could bend the pins if the processor is misaligned.

When the processor is positioned correctly, it drops down into the socket with minimal pressure.

- c. When the processor is fully seated in the socket, rotate the socket release lever back down until it snaps into place, securing the processor.

12. 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 in [step 6](#).

- b. Apply thermal grease evenly to the top of the processor.
- c. Place the heat sink onto the processor. See [Figure 6-6](#).
- d. Close one of the two heat sink retention levers until it locks. See [Figure 6-6](#).
- e. Repeat for the other heat sink retention lever.

13. Install the new front fan in the empty fan connector in front of the new processor. See "[System Fans](#)."

14. Replace the memory module shroud.

15. 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.

16. 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.

17. Run the system diagnostics to verify that the new processor operates correctly.


See "[Running System Diagnostics](#)" for information about running the diagnostics and troubleshooting processor problems.


---

## System Battery

The system battery is a 3.0-volt (V), coin-cell 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. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

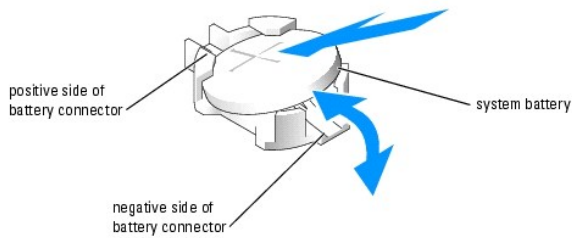
 **CAUTION:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See your *System Information Guide* for additional information.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Lift up the memory airflow shroud.
4. Locate the battery socket. See [Figure A-3](#).

➡ **NOTICE:** If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

➡ **NOTICE:** To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

5. Remove the system battery.
  - a. Support the battery connector by pressing down firmly on the positive side of the connector.
  - b. While supporting the battery connector, press the battery toward the positive side of the connector and pry it up out of the securing tabs at the negative side of the connector.



➡ **NOTICE:** To avoid damage to the battery connector, you must firmly support the connector while installing or removing a battery.

6. Install the new system battery.
  - a. Support the battery connector by pressing down firmly on the positive side of the connector.
  - b. Hold the battery with the "+" facing up, and slide it under the securing tabs at the positive side of the connector.
  - c. Press the battery straight down into the connector until it snaps into place.
7. Lower the memory airflow shroud.
8. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
9. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
10. Enter the System Setup program to confirm that the battery is operating properly. See "Using the System Setup Program" in the *User's Guide*.
11. Enter the correct time and date in the System Setup program's **Time** and **Date** fields.
12. Exit the System Setup program.
13. To test the newly installed battery, turn off the system and disconnect it from the electrical outlet for at least an hour.
14. After an hour, reconnect the system to its electrical outlet and turn it on.
15. Enter the System Setup program and if the time and date are still incorrect, see "[Getting Help](#)" for instructions on obtaining technical assistance.

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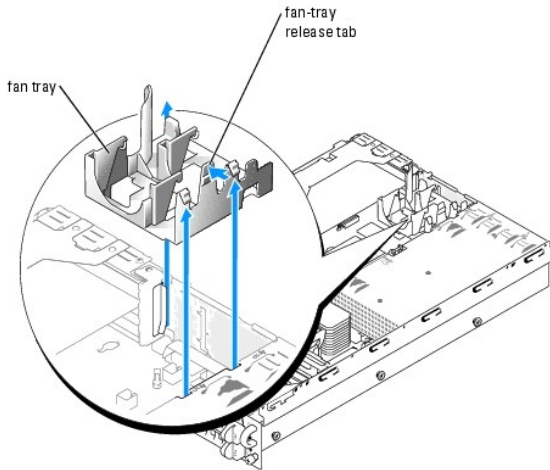
## Installing an Optional RAC Card

⚠ **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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.

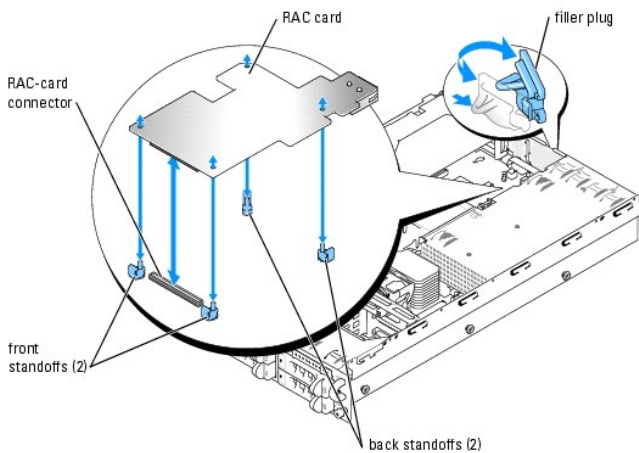
2. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
3. Remove the two system fans. See "[Removing a Cooling Fan](#)."
4. Remove the fan tray:
  - a. Press the fan-tray release tab. See [Figure 6-8](#).
  - b. Lift the fan tray straight up and out of the system.

**Figure 6-8. Removing the Rear Fan Tray**



5. Remove the plastic filler plug from the system back panel. See [Figure 6-9](#).
6. Angle the RAC card so that its NIC connector inserts through the back-panel RAC card opening, and then straighten the card.

**Figure 6-9. Installing a RAC Card**



7. Align the front edge of the RAC card with the two front plastic standoffs adjacent to the RAC system board connector, and press down the front of the card until it is fully seated. See [Figure 6-9](#).

When the front of the card is fully seated, the two front plastic standoffs snap over the front edge of the card.

8. Align the back edge of the RAC card with the two back plastic standoffs, and press down the back of the card until it is fully seated. See [Figure 6-9](#).

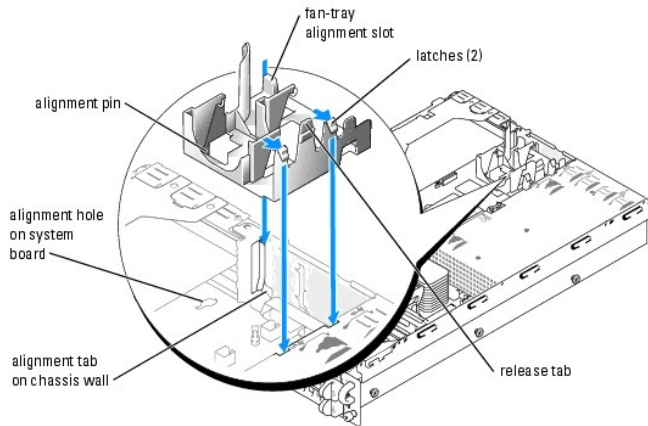
When the back of the card is fully seated, the two back plastic standoffs snap over the back edge of the card.

9. Replace the back fan tray:
  - a. Align the fan-tray alignment slot with the alignment tab on the side of the chassis wall. See [Figure 6-10](#).



- b. Align the alignment pin on the bottom of the fan tray with the alignment hole on the system board.
- c. Slide the fan tray straight down.
- d. Press the two left latches until the release tab securely snaps into its securing slot.

**Figure 6-10. Installing the Rear Fan Tray**



10. Replace the two rear system fans. See "[Replacing a Cooling Fan.](#)"
11. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
12. Reconnect the system and peripherals to their power sources, and turn them on.
13. Enter the System Setup program and verify that the setting for the SCSI controller has changed to reflect the presence of the RAID hardware. 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.

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## Installing Drives

### Dell™ PowerEdge™ 2850 Systems Installation and Troubleshooting Guide

- [SCSI Interface Cables](#)
- [SCSI Configuration Information](#)
- [External SCSI Tape Drive](#)
- [SCSI Hard Drives](#)
- [Optical and Diskettes Drives](#)
- [Activating the Integrated RAID Controller](#)
- [Installing a RAID Controller Card](#)
- [Installing a SCSI Backplane Daughter Card](#)
- [Configuring the Boot Device](#)

Your system contains up to six 1-inch SCSI hard drives. An optional optical drive and an optional diskette drive are mounted on separate trays that slide into the front panel and SCSI backplane board. This section contains instructions for replacing those drive devices.

---

## 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 Configuration Information

Although SCSI devices are installed in essentially the same way as other devices, their configuration requirements are different. To configure an external SCSI device, follow the guidelines in the following subsections.

## SCSI ID Numbers

Each device attached to a SCSI host adapter must have a unique SCSI ID number from 0 to 15.

Set the tape SCSI ID using the jumper and switch settings on the drive to prevent conflict with any other device IDs on the bus. For default SCSI ID settings, refer to the tape drive documentation.

 **NOTE:** There is no requirement that SCSI ID numbers be assigned sequentially or that devices be attached to the cable in order by ID number.

## Device Termination


SCSI logic requires that termination be enabled for the two devices at opposite ends of the SCSI chain and disabled for all devices in between. For internal SCSI devices, termination is configured automatically. For external SCSI devices, you should disable termination on all devices and use terminated cables. See the documentation provided with any optional SCSI device you purchase for information on disabling termination.

---

## External SCSI Tape Drive

This subsection describes how to configure and install an external SCSI tape drive.

## Installing an External SCSI Tape Drive

 **NOTICE:** See "Protecting Against Electrostatic Discharge" in the safety instructions in your *Product Information Guide*.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Prepare the tape drive for installation.

Ground yourself by touching an unpainted metal surface on the back of the system, unpack the drive (and controller card, if applicable), and compare the jumper and switch settings with those in the drive documentation.

See "[SCSI Configuration Information](#)," for information on setting the drive's SCSI ID number and enabling termination (if required). Change any settings necessary for your system's configuration.

3. Connect the tape drive's interface cable to the external SCSI connector on the controller card.

4. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
5. Perform a tape backup and verification test with the drive as instructed in the software documentation that came with the drive.

## Installing an Internal SCSI Tape Drive

 **NOTICE:** See "Protecting Against Electrostatic Discharge" in the safety instructions in your *Product Information Guide*.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Prepare the tape drive for installation.

Ground yourself by touching an unpainted metal surface on the back of the system, unpack the drive (and controller card, if applicable), and compare the jumper and switch settings with those in the drive documentation.

See "[SCSI Configuration Information](#)," for information on setting the drive's SCSI ID number and enabling termination (if required). Change any settings necessary for your system's configuration.

3. Insert the tape drive into hard drive bay number 5 (top right).

Hard drives bays are numbered 0 through 5 starting at the lower leftmost drive bay.

4. To use the integrated SCSI controller, connect the tape drive's SCSI interface cable to either the SCSI A or SCSI B connector on the riser board. See [Figure A-4](#) or [Figure A-5](#). To use an optional SCSI controller card, connect the tape drive's SCSI interface cable to the card's SCSI connector.
5. Connect the tape drive power cable to the tape drive power connector on the backplane. See [Figure A-6](#).
6. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
7. Perform a tape backup and verification test with the drive as instructed in the software documentation that came with the drive.

---

## SCSI Hard Drives

This subsection describes how to install and configure SCSI hard drives in the system's internal hard-drive bays.


### Before You Begin

Before attempting to remove or install a drive while the system is running, see the RAID documentation and ensure that the system is configured correctly to support hot-pluggable drive removal and insertion.

SCSI hard drives are supplied in special drive carriers that fit in the hard-drive bays.

 **NOTE:** You should only use drives that have been tested and approved for use with the SCSI backplane board.

You may need to use different programs than those provided with the operating system to partition and format SCSI hard drives. See "Installing and Configuring SCSI Drivers" in the *User's Guide* for information and instructions.

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

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

## SCSI Backplane Board Configuration

The hard-drive bays provide space for up to six 1-inch SCSI hard drives. The hard drives connect to a controller on the system board or a RAID controller card through the SCSI backplane board.

The system provides several options for hard drive configurations:

1. SCSI backplane daughter card:
  - o 1x6 configuration, without the SCSI backplane daughter card installed
  - o 2/4 split configuration, with the SCSI backplane daughter card installed

See "[Installing a SCSI Backplane Daughter Card](#)."

- 1 SCSI controller:
  - o Integrated SCSI controller
  - o Optional integrated RAID controller. See "[Activating the Integrated RAID Controller.](#)"
  - o RAID controller card. See "[Installing a RAID Controller Card.](#)"
- 1 Cabling:
  - o If a RAID controller card is not installed, connect the appropriate SCSI cables between the SCSI A and/or SCSI B connectors on riser board and the SCSI A or SCSI B connectors on backplane board to use either the integrated SCSI controller or optional integrated RAID controller in either a 1x6 or 2/4 split configuration.
  - o If a RAID controller card is installed, cables can be connected from the controller card to SCSI A and/or SCSI B backplane board connector(s). A backplane board connector that is not attached to the RAID controller card will use the integrated SCSI controller or optional integrated RAID controller if it is attached to the riser board.
  - o If a cable is connected to the SCSI B backplane board connector, the SCSI backplane daughter card must be installed to activate the 2/4 split configuration. Otherwise, the system will display an error message.

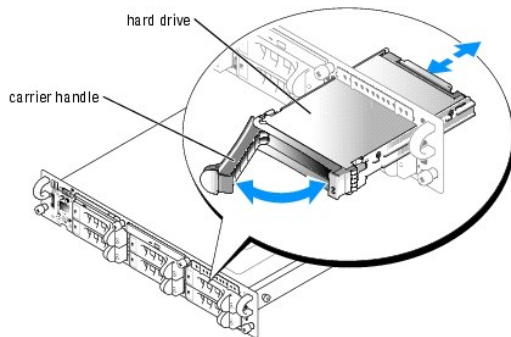
See [Figure A-6](#) to locate the connectors on the SCSI backplane board.

## Installing a SCSI Hard Drive

- ➔ **NOTICE:** When installing a hard drive, ensure that the adjacent drives are fully installed. Inserting a hard-drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
- ➔ **NOTICE:** Not all operating systems support hot-plug drive installation. See the documentation supplied with your operating system.

1. Remove the bezel. See "[Removing the Bezel](#)" in "Troubleshooting Your System."
2. Open the hard-drive carrier handle. See [Figure 7-1](#).

**Figure 7-1. Installing a SCSI Hard-Drive**



- ➔ **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 7-1](#).
4. Close the hard-drive carrier handle to lock it in place.
5. Replace the bezel. See "[Replacing the Bezel](#)" in "Troubleshooting Your System."
6. Install any required SCSI device drivers. See "Installing and Configuring SCSI Drivers" in the *User's Guide* for information.
7. If the hard drive is new, run the SCSI controllers test in system diagnostics.

## Removing a SCSI Hard Drive

- ➔ **NOTICE:** Not all operating systems support hot-plug drive installation. See the documentation supplied with your operating system.

1. Remove the bezel. See "[Removing the Bezel](#)" in "Troubleshooting Your System."
2. Take the hard drive offline and wait until the SCSI hard-drive indicator codes on the drive carrier signal that the drive may be removed safely. See [Table 2-3](#).

If the drive has been online, the drive status indicator will blink green two times a 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 7-1](#).
4. Slide the hard drive out until it is free of the drive bay. See [Figure 7-1](#).  
If you are permanently removing the hard drive, install a blank insert.
5. Replace the bezel. See "[Replacing the Bezel](#)" in "Troubleshooting Your System."

---

## Optical and Diskettes Drives

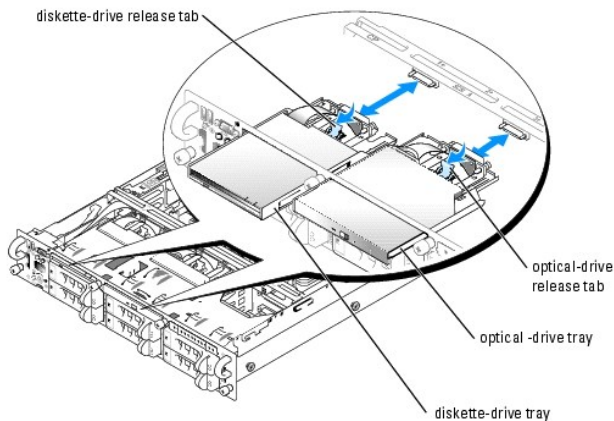
An optional optical drive and an optional diskette drive are mounted on trays that slide in the front panel and connect to the controllers on the system board through the SCSI backplane board.

### Removing the Optical Drive or Diskette Drive Tray

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. 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 its electrical outlet.
2. Remove the bezel. See "[Removing the Bezel](#)" in "Troubleshooting Your System."
3. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
4. To remove the optical drive or diskette tray, press forward on the blue tray release tab and slide the drive tray out of the system. See [Figure 7-2](#).

**Figure 7-2. Removing and Installing the Optical Drive or Diskette Drive Tray**



### Installing the Optical Drive or Diskette Drive Tray

1. Align the optical drive or diskette drive tray with its appropriate opening in the front panel.

The optical drive opening is above hard-drive slots 2 and 3 and the diskette drive opening is above hard-drive slots 0 and 1 (the hard-drives slots are identified by labels on the front panel of the system).

2. Slide in the drive tray until the tray snaps into place. See [Figure 7-2](#).
3. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."

4. Replace the bezel. See "[Replacing the Bezel](#)" in "Troubleshooting Your System."
5. Reconnect your system and peripherals to their electrical outlets, and turn on the system.

---

## Activating the Integrated RAID Controller

**⚠ CAUTION:** Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions. See the *Product Information Guide* for additional information.

**⚠ CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

**🔄 NOTICE:** To avoid possible data loss, back up all data on the hard drives before changing the mode of operation of the integrated SCSI controller from SCSI to RAID.

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 system. See "[Opening the System](#)" in "Troubleshooting Your System."
4. Push the ejectors on the RAID memory module connector down and outward to allow the memory module to be inserted into the connector. See [Figure 7-3](#).  
See [Figure A-4](#) or [Figure A-5](#) to locate the RAID memory module connector on the expansion-card riser board.

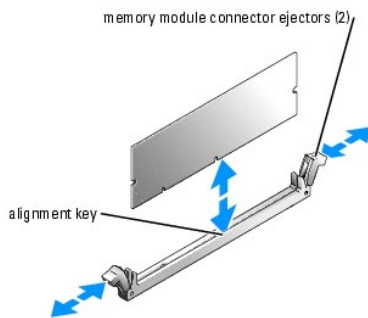
5. Align the memory module's edge connector with the alignment key, and insert the memory module in the connector. See [Figure 7-3](#).

The memory module connector has an alignment key that allows the memory module to be installed in the connector in only one way.

**🔍 NOTE:** The RAID controller memory module must be a 256MB, registered DDR2 (PC3200) memory module, rated to run at 400 MHz or faster.

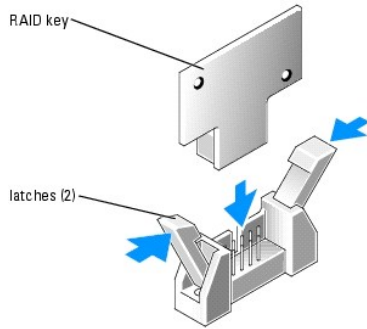
6. Press on the memory module with your thumbs while pulling up on the ejectors with your index fingers to lock the memory module into the connector.

**Figure 7-3. Installing the RAID Controller Memory Module**



7. Lift up the memory airflow shroud and locate the RAID hardware key connector on the system board. See [Figure A-3](#).
8. Push the ejectors on the RAID hardware key connector down and outward to allow the key to be inserted into the connector. See [Figure 7-4](#).
9. Insert the RAID hardware key into its connector on the system board and secure the key with the latches on each end of the connector. See [Figure 7-4](#).
10. Gently press on the hardware key with your thumbs while pulling up on the ejectors with your index fingers to lock the hardware key into the connector.
11. Lower the memory airflow shroud.

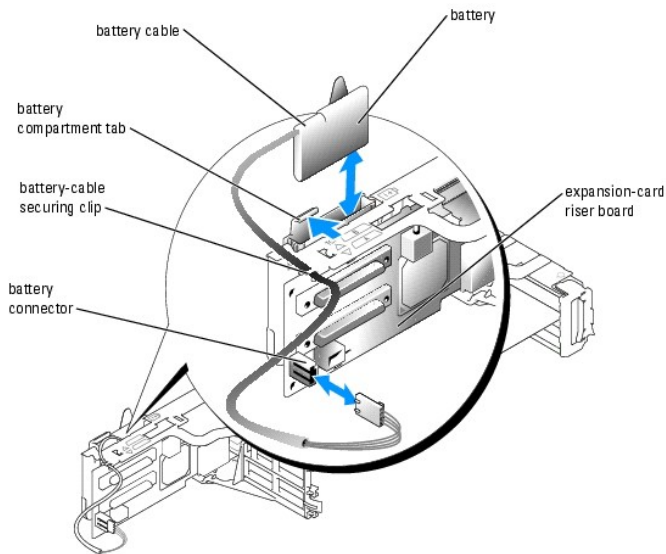
**Figure 7-4. Installing the RAID Hardware Key**



12. Gently pull and hold open the RAID battery compartment tab, route the RAID battery cable through the bottom opening, and then lower the RAID battery into the compartment. See [Figure 7-5](#).
13. Route the battery cable through the battery-cable securing clip and connect the battery cable to the RAID battery cable connector on the expansion-card riser board. See [Figure 7-5](#).

See [Figure A-4](#) or [Figure A-5](#) to locate the RAID battery cable connector on the expansion-card riser board.

**Figure 7-5. Removing and Installing the RAID Battery**



14. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
15. Reconnect the system to its electrical outlet and turn on the system, including any attached peripherals.
16. Enter the System Setup program and verify that the setting for the SCSI controller has changed to reflect the presence of the RAID hardware. Change settings of the SCSI controller to enable RAID mode. Restart the system and press y to confirm the changes. See "Using the System Setup Program" in your *User's Guide*.
17. Install the RAID software.  
See the RAID documentation for more information.

## Installing a RAID Controller Card


**CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

Follow these general guidelines when installing a RAID controller card. For specific instructions, see the documentation supplied with the RAID controller card.

1. Unpack the RAID controller card and prepare it for installation.

For instructions, see the documentation accompanying the card.

2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
4. Install the RAID controller card. See "[Installing an Expansion Card](#)" in "Installing System Options."
5. Connect SCSI interface cables supplied with the card to the SCSI A and/or SCSI B connectors on the SCSI backplane board.

 **NOTE:** Cables can be connected from the RAID controller card to SCSI A and/or SCSI B backplane board connector(s). A backplane board connector that is not attached to the RAID controller card uses the integrated SCSI controller or optional integrated RAID controller if it is attached to the riser board.


To identify the connector on the RAID controller card, see documentation for the card. See [Figure A-6](#) to locate the SCSI controller connectors on the SCSI backplane board.

Route the SCSI cables over the SCSI backplane board to the expansion-card cage.

6. Connect the external SCSI devices to the card's external connector on the system's back panel.  
If you are attaching multiple external SCSI devices, daisy-chain the devices to each other using the cables shipped with each device.
7. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
8. Reconnect the system to its electrical outlet and turn the system on, including any attached peripherals.
9. Install any required SCSI device drivers. See "Installing and Configuring SCSI Drivers" in the *User's Guide*.
10. Test the SCSI devices.  
Test a SCSI hard drive by running the **SCSI Controllers** test in the system diagnostics.

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## Installing a SCSI Backplane Daughter Card

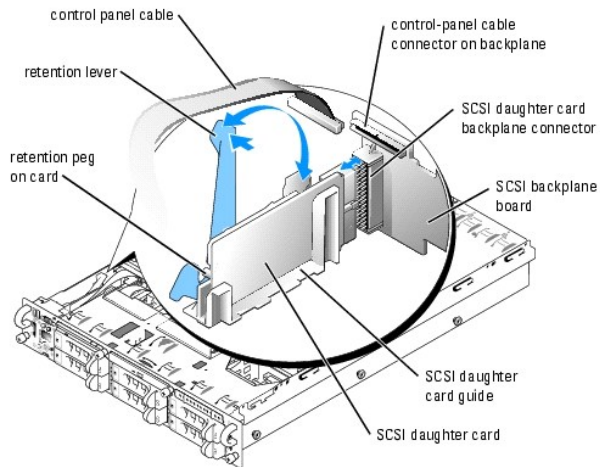
 **CAUTION:** Only trained service technicians are authorized to remove the system cover and access any of the components inside the system. See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.

To operate the SCSI backplane in a 2/4 split backplane configuration, you must install a daughter card.

1. Unpack the SCSI backplane board daughter card kit.
2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system. See "[Opening the System](#)" in "Troubleshooting Your System."
4. Disconnect the control panel cable from its backplane connector. See [Figure 7-6](#).  
The SCSI backplane daughter card connector and card guide are located in the compartment below the control panel cable.
5. The daughter card fits between the sides of the card guide. To install the daughter card in the card guide and to connect it to the backplane connector, performing the following steps:
  - a. Ensure that the retention lever is in the open position.
  - b. Hold the daughter card by its edges with the card connector facing the SCSI backplane board and the card's retention peg facing the retention lever. See [Figure 7-6](#).
  - c. Lower the card into the card guide.
  - d. Close the retention lever to slide the daughter card into the SCSI backplane connector and lock the card into place. See [Figure 7-6](#).
6. Reconnect the control panel cable to its backplane connector. See [Figure 7-6](#).

**Figure 7-6. Installing a SCSI Backplane Daughter Card**





7. Reconfigure the SCSI cable connections to the SCSI backplane as necessary to operate the backplane as a 2/4 split backplane:
  - 1 If a RAID controller card is not installed, connect the appropriate SCSI cables between the SCSI A and/or SCSI B connectors on riser board and the SCSI A or SCSI B connectors on backplane board to use either the integrated SCSI controller or optional integrated RAID controller in either a 1x6 or 2/4 split configuration.
  - 1 If a RAID controller card is installed, cables can be connected from the controller card to SCSI A and/or SCSI B backplane board connector(s). A backplane board connector that is not attached to the RAID controller card will use the integrated SCSI controller or optional integrated RAID controller if it is attached to the riser board.
  - 1 If a cable is connected to the SCSI B backplane board connector, the SCSI backplane daughter card must be installed to activate the 2/4 split configuration. Otherwise, the system will display an error message.

See [Figure A-6](#) to locate the connectors on the SCSI backplane board.
8. Close the system. See "[Closing the System](#)" in "Troubleshooting Your System."
9. Reconnect your system and peripherals to their electrical outlets, and turn on the system.

## Configuring the Boot Device

If you plan to boot the system from a hard drive, the drive must be attached to the primary (or boot) controller. The device that the system boots from is determined by the boot order specified in the System Setup program.

The System Setup program provides options that the system uses to scan for installed boot devices. See your system's *User's Guide* for information about the System Setup program.

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## Getting Help

### Dell™ PowerEdge™ 2850 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](#)
  - [Dell Contact Numbers](#)
- 

## 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](http://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](http://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:

- 1 World Wide Web

[www.dell.com/](http://www.dell.com/)

[www.dell.com/ap/](http://www.dell.com/ap/) (Asian/Pacific countries only)

[www.dell.com/jp](http://www.dell.com/jp/) (Japan only)

[www.euro.dell.com](http://www.euro.dell.com) (Europe only)

[www.dell.com/la](http://www.dell.com/la/) (Latin American countries)

[www.dell.ca](http://www.dell.ca) (Canada only)

- 1 Anonymous file transfer protocol (FTP)

[ftp.dell.com/](ftp://ftp.dell.com/)

Log in as user:anonymous, and use your e-mail address as your password.

- 1 Electronic Support Service

[support@us.dell.com](mailto:support@us.dell.com)

[apsupport@dell.com](mailto:apsupport@dell.com) (Asian/Pacific countries only)

**support.jp.dell.com** (Japan only)

**support.euro.dell.com** (Europe only)

1 Electronic Quote Service

sales@dell.com

apmarketing@dell.com (Asian/Pacific countries only)

sales\_canada@dell.com (Canada only)

1 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.

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## Dell Enterprise Training and Certification

Dell Enterprise Training and Certification is available; see [www.dell.com/training](http://www.dell.com/training) for more information. This service may not be offered in all locations.

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## 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.

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## 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](http://www.dell.com). For the telephone number to call to speak to a sales specialist, see the contact information for your region.

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## 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.

<b>Diagnostics Checklist</b>
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:

---

## Dell Contact Numbers

To contact Dell electronically, you can access the following websites:

- 1 [www.dell.com](http://www.dell.com)
- 1 [support.dell.com](http://support.dell.com) (technical support)
- 1 [premiersupport.dell.com](http://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.

Country (City)	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
----------------	---	--

International Access Code Country Code City Code		
<b>Anguilla</b>	General Support	toll-free: 800-335-0031
<b>Antigua and Barbuda</b>	General Support	1-800-805-5924
<b>Argentina (Buenos Aires)</b>	Website: <a href="http://www.dell.com.ar">www.dell.com.ar</a>	
International Access Code: 00	Tech Support and Customer Care	toll-free: 0-800-444-0733
Country Code: 54	Sales	0-810-444-3355
City Code: 11	Tech Support Fax	11 4515 7139
	Customer Care Fax	11 4515 7138
<b>Aruba</b>	General Support	toll-free: 800-1578
<b>Australia (Sydney)</b>	E-mail (Australia): <a href="mailto:au_tech_support@dell.com">au_tech_support@dell.com</a>	
International Access Code: 0011	E-mail (New Zealand): <a href="mailto:nz_tech_support@dell.com">nz_tech_support@dell.com</a>	
Country Code: 61	Home and Small Business	1-300-65-55-33
City Code: 2	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
	Corporate Sales	toll-free: 1-800-808-385
	Transaction Sales	toll-free: 1-800-808-312
	Fax	toll-free: 1-800-818-341
<b>Austria (Vienna)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: 900	E-mail: <a href="mailto:tech_support_central_europe@dell.com">tech_support_central_europe@dell.com</a>	
Country Code: 43	Home/Small Business Sales	0820 240 530 00
City Code: 1	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
<b>Bahamas</b>	General Support	toll-free: 1-866-278-6818
<b>Barbados</b>	General Support	1-800-534-3066
<b>Belgium (Brussels)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: 00	E-mail: <a href="mailto:tech_be@dell.com">tech_be@dell.com</a>	
Country Code: 32	E-mail for French Speaking Customers: <a href="http://support.euro.dell.com/be/fr/emaildell/">support.euro.dell.com/be/fr/emaildell/</a>	
City Code: 2	Technical Support	02 481 92 88
	Customer Care	02 481 91 19
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
<b>Bermuda</b>	General Support	1-800-342-0671
<b>Bolivia</b>	General Support	toll-free: 800-10-0238
<b>Brazil</b>	Website: <a href="http://www.dell.com/br">www.dell.com/br</a>	
International Access Code: 00	Customer Support, Technical Support	0800 90 3355
Country Code: 55	Tech Support Fax	51 481 5470
City Code: 51	Customer Care Fax	51 481 5480
	Sales	0800 90 3390
<b>British Virgin Islands</b>	General Support	toll-free: 1-866-278-6820
<b>Brunei</b>	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
<b>Canada (North York, Ontario)</b>	Online Order Status: <a href="http://www.dell.ca/ostatus">www.dell.ca/ostatus</a>	
International Access Code: 011	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	TechFax	toll-free: 1-800-950-1329
	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
<b>Cayman Islands</b>	General Support	1-800-805-7541
<b>Chile (Santiago)</b>	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
Country Code: <b>56</b>		
City Code: <b>2</b>		
<b>China (Xiamen)</b>	Tech Support website: <a href="http://support.dell.com.cn">support.dell.com.cn</a>	
Country Code: <b>86</b>	Tech Support E-mail: <a href="mailto:cn_support@dell.com">cn_support@dell.com</a>	
City Code: <b>592</b>	Tech 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 Experience	toll-free: 800 858 2060
	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 2222
	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
<b>Colombia</b>	General Support	980-9-15-3978
<b>Costa Rica</b>	General Support	0800-012-0435
<b>Czech Republic (Prague)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:czech_dell@dell.com">czech_dell@dell.com</a>	
Country Code: <b>420</b>	Technical Support	02 2186 27 27
City Code: <b>2</b>	Customer Care	02 2186 27 11
	Fax	02 2186 27 14
	TechFax	02 2186 27 28
	Switchboard	02 2186 27 11
<b>Denmark (Copenhagen)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail Support (portable computers): <a href="mailto:den_nbk_support@dell.com">den_nbk_support@dell.com</a>	
Country Code: <b>45</b>	E-mail Support (desktop computers): <a href="mailto:den_support@dell.com">den_support@dell.com</a>	
	E-mail Support (servers): <a href="mailto:Nordic_server_support@dell.com">Nordic_server_support@dell.com</a>	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Fax Switchboard (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Fax Switchboard (Home/Small Business)	3287 5001
<b>Dominica</b>	General Support	toll-free: 1-866-278-6821
<b>Dominican Republic</b>	General Support	1-800-148-0530
<b>Ecuador</b>	General Support	toll-free: 999-119
<b>El Salvador</b>	General Support	01-899-753-0777
<b>Finland (Helsinki)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>990</b>	E-mail: <a href="mailto:fin_support@dell.com">fin_support@dell.com</a>	
Country Code: <b>358</b>	E-mail Support (servers): <a href="mailto:Nordic_support@dell.com">Nordic_support@dell.com</a>	
City Code: <b>9</b>	Technical Support	09 253 313 60
	Technical Support Fax	09 253 313 81
	Relational Customer Care	09 253 313 38
	Home/Small Business Customer Care	09 693 791 94
	Fax	09 253 313 99

	Switchboard	09 253 313 00
<b>France (Paris) (Montpellier)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/fr/fr/emaildell/">support.euro.dell.com/fr/fr/emaildell/</a>	
Country Code: <b>33</b>	<b>Home and Small Business</b>	
City Codes: <b>(1) (4)</b>	Technical Support	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
	<b>Corporate</b>	
	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
<b>Germany (Langen)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:tech_support_central_europe@dell.com">tech_support_central_europe@dell.com</a>	
Country Code: <b>49</b>	Technical Support	06103 766-7200
City Code: <b>6103</b>	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
<b>Greece</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/gr/en/emaildell/">support.euro.dell.com/gr/en/emaildell/</a>	
Country Code: <b>30</b>	Technical Support	080044149518
	Gold Technical Support	08844140083
	Switchboard	2108129800
	Sales	2108129800
	Fax	2108129812
<b>Grenada</b>	General Support	toll-free: 1-866-540-3355
<b>Guatemala</b>	General Support	1-800-999-0136
<b>Guyana</b>	General Support	toll-free: 1-877-270-4609
<b>Hong Kong</b>	Website: <a href="http://support.ap.dell.com">support.ap.dell.com</a>	
International Access Code: <b>001</b>	E-mail: <a href="mailto:ap_support@dell.com">ap_support@dell.com</a>	
Country Code: <b>852</b>	Technical Support (Dimension™ and Inspiron™)	2969 3189
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	Gold Queue EEC Hotline	2969 3187
	Customer Advocacy	3416 0910
	Large Corporate Accounts	3416 0907
	Global Customer Programs	3416 0908
	Medium Business Division	3416 0912
	Home and Small Business Division	2969 3105
<b>India</b>	Technical Support	1600 33 8045
	Sales	1600 33 8044
<b>Ireland (Cherrywood)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>16</b>	E-mail: <a href="mailto:dell_direct_support@dell.com">dell_direct_support@dell.com</a>	
Country Code: <b>353</b>	Technical Support	1850 543 543
City Code: <b>1</b>	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/SalesFax	01 204 0103
	Switchboard	01 204 4444
<b>Italy (Milan)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/it/it/emaildell/">support.euro.dell.com/it/it/emaildell/</a>	
Country Code: <b>39</b>	<b>Home and Small Business</b>	
City Code: <b>02</b>	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	<b>Corporate</b>	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
<b>Jamaica</b>	General Support (dial from within Jamaica only)	1-800-682-3639
<b>Japan (Kawasaki)</b>	Website: <a href="http://support.jp.dell.com">support.jp.dell.com</a>	
International Access Code: <b>001</b>	Technical Support (servers)	toll-free: 0120-198-498
Country Code: <b>81</b>	Technical Support outside of Japan (servers)	81-44-556-4162
City Code: <b>44</b>	<b>Technical Support (Dimension™ and Inspiron™)</b>	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	<b>Technical Support (Dell Precision™, OptiPlex™, and Latitude™)</b>	toll-free: 0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	<b>Technical Support (Axim™)</b>	toll-free: 0120-981-690
	Technical Support outside of Japan (Axim)	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
<b>Korea (Seoul)</b>	Technical Support	toll-free: 080-200-3800
International Access Code: <b>001</b>	Sales	toll-free: 080-200-3600
Country Code: <b>82</b>	Customer Service (Seoul, Korea)	toll-free: 080-200-3800
City Code: <b>2</b>	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	Switchboard	2194-6000
<b>Latin America</b>	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
<b>Luxembourg</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:tech_be@dell.com">tech_be@dell.com</a>	
Country Code: <b>352</b>	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
<b>Macao</b>	Technical Support	toll-free: 0800 582
Country Code: <b>853</b>	Customer Service (Penang, Malaysia)	604 633 4949



	Transaction Sales	toll-free: 0800 581
<b>Malaysia (Penang)</b>	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free: 1 800 88 0193
International Access Code: 00	Technical Support (Dimension and Inspiron)	toll-free: 1 800 88 1306
Country Code: 60	Customer Service	04 633 4949
City Code: 4	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213
<b>Mexico</b>	Customer Technical Support	001-877-384-8979 or 001-877-269-3383
International Access Code: 00	Sales	50-81-8800 or 01-800-888-3355
Country Code: 52	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800 or 01-800-888-3355
<b>Montserrat</b>	General Support	toll-free: 1-866-278-6822
<b>Netherlands Antilles</b>	General Support	001-800-882-1519
<b>Netherlands (Amsterdam)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: 00	E-mail (Technical Support):	
Country Code: 31	(Enterprise): nl_server_support@dell.com	
City Code: 20	(Latitude): nl_latitude_support@dell.com	
	(Inspiron): nl_inspiron_support@dell.com	
	(Dimension): nl_dimension_support@dell.com	
	(OptiPlex): nl_optiplex_support@dell.com	
	(Dell Precision): nl_workstation_support@dell.com	
	Technical Support	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
<b>New Zealand</b>	E-mail (New Zealand): nz_tech_support@dell.com	
International Access Code: 00	E-mail (Australia): au_tech_support@dell.com	
Country Code: 64	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
<b>Nicaragua</b>	General Support	001-800-220-1006
<b>Norway (Lysaker)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: 00	E-mail Support (portable computers):	
Country Code: 47	nor_nbk_support@dell.com	
	E-mail Support (desktop computers):	
	nor_support@dell.com	
	E-mail Support (servers):	
	nordic_server_support@dell.com	
	Technical Support	671 16882
	Relational Customer Care	671 17514
	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
<b>Panama</b>	General Support	001-800-507-0962

<b>Peru</b>	General Support	0800-50-669
<b>Poland (Warsaw)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>011</b>	E-mail: <a href="mailto:pl_support_tech@dell.com">pl_support_tech@dell.com</a>	
Country Code: <b>48</b>	Customer Service Phone	57 95 700
City Code: <b>22</b>	Customer Care	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
<b>Portugal</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/pt/en/emailldell/">support.euro.dell.com/pt/en/emailldell/</a>	
Country Code: <b>351</b>	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
<b>Puerto Rico</b>	General Support	1-800-805-7545
<b>St. Kitts and Nevis</b>	General Support	toll-free: 1-877-441-4731
<b>St. Lucia</b>	General Support	1-800-882-1521
<b>St. Vincent and the Grenadines</b>	General Support	toll-free: 1-877-270-4609
<b>Singapore (Singapore)</b>	Technical Support	toll-free: 800 6011 051
International Access Code: <b>005</b>	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: <b>65</b>	Transaction Sales	toll-free: 800 6011 054
	Corporate Sales	toll-free: 800 6011 053
<b>South Africa (Johannesburg)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code:	E-mail: <a href="mailto:dell_za_support@dell.com">dell_za_support@dell.com</a>	
<b>09/091</b>	Technical Support	011 709 7710
Country Code: <b>27</b>	Customer Care	011 709 7707
City Code: <b>11</b>	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
<b>Southeast Asian and Pacific Countries</b>	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
<b>Spain (Madrid)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/es/es/emailldell/">support.euro.dell.com/es/es/emailldell/</a>	
Country Code: <b>34</b>	<b>Home and Small Business</b>	
City Code: <b>91</b>	Technical Support	902 100 130
	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	<b>Corporate</b>	
	Technical Support	902 100 130
	Customer Care	902 118 546
	Switchboard	91 722 92 00
	Fax	91 722 95 83
<b>Sweden (Upplands Vasby)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:swe_support@dell.com">swe_support@dell.com</a>	
Country Code: <b>46</b>	E-mail Support for Latitude and Inspiron: <a href="mailto:Swe-nbk_kats@dell.com">Swe-nbk_kats@dell.com</a>	
City Code: <b>8</b>	E-mail Support for OptiPlex: <a href="mailto:Swe_kats@dell.com">Swe_kats@dell.com</a>	
	E-mail Support for Servers: <a href="mailto:Nordic_server_support@dell.com">Nordic_server_support@dell.com</a>	
	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
	Fax Technical Support	08 590 05 594
	Sales	08 590 05 185
<b>Switzerland (Geneva)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	

International Access Code: 00	E-mail: Tech_support_central_Europe@dell.com	
Country Code: 41	E-mail for French-speaking HSB and Corporate Customers: <b>support.euro.dell.com/ch/fr/emaildell/</b>	
City Code: 22	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
<b>Taiwan</b>	Technical Support (portable and desktop computers)	toll-free: 00801 86 1011
International Access Code: 002	Technical Support (servers)	toll-free: 0080 60 1256
Country Code: 886	Transaction Sales	toll-free: 0080 651 228
	Corporate Sales	toll-free: 0080 651 227
<b>Thailand</b>	Technical Support	toll-free: 0880 060 07
International Access Code: 001	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: 66	Sales	toll-free: 0880 060 09
<b>Trinidad/Tobago</b>	General Support	1-800-805-8035
<b>Turks and Caicos Islands</b>	General Support	toll-free: 1-866-540-3355
<b>U.K. (Bracknell)</b>	Website: <b>support.euro.dell.com</b>	
International Access Code: 00	Customer Care website: <b>support.euro.dell.com/uk/en/ECare/Form/Home.asp</b>	
Country Code: 44	E-mail: dell_direct_support@dell.com	
	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct/PAD 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
	<b>Uruguay</b>	General Support
<b>U.S.A. (Austin, Texas)</b>	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: 011	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
	<b>Consumer (Home and Home Office)</b>	
Country Code: 1	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: <b>www.dellfinancialservices.com</b>	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	<b>Business</b>	
	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
	<b>Public (government, education, and healthcare)</b>	
	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-DELLTY (1-877-335-5889)
<b>U.S. Virgin Islands</b>	General Support	1-877-673-3355
<b>Venezuela</b>	General Support	8001-3605

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