Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

Notes, Notices, and Cautions

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

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

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

Abbreviations and Acronyms

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

Jumpers and Connectors

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

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

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

Jumpers—A General Explanation

Jumpers provide a convenient and reversible way of reconfiguring the circuitry on a printed circuit board. When reconfiguring the system, you may need to change jumper settings on circuit boards or drives.

Jumpers

Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. To change a jumper setting, pull the plug off its pin(s) and carefully fit it down onto the pin(s) indicated. Figure A-1 shows an example of a jumper.

Figure A-1. Example Jumpers
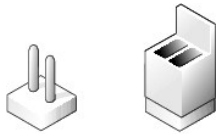
⚠ **CAUTION: Ensure that the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.**

A jumper is referred to as open or unjumpered when the plug is pushed down over only one pin or if there is no plug at all. When the plug is pushed down over two pins, the jumper is referred to as jumpered. The jumper setting is often shown in text as two numbers, such as 1–2. The number 1 is printed on the circuit board 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 the designations, default settings, and functions of the system's jumpers.

System Board Jumpers

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

Figure A-2. System Board Jumpers
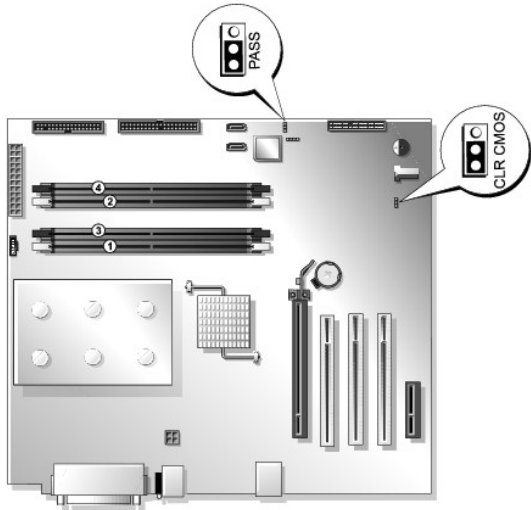
Table A-1. System Board Jumper Settings

Jumper	Setting	Description
PASS	[img] (default)	The password feature is enabled.
	[img]	The password feature is disabled.
CLR CMOS	[img] (default)	The configuration settings in NVRAM are retained at system boot.
	[img]	The configuration settings in NVRAM are cleared at next system boot.
[img] jumpered [img] unjumpered		

System Board Connectors

See Figure A-3 and Table A-2 for the location and description of system board connectors. Figure A-3 also indicates expansion slots and bus operating speeds.

Figure A-3. System Board Connectors

Table A-2. System Board Connectors

Connector	Description
BATTERY	System battery
CLR CMOS	CMOS
CPU FAN	Processor fan power
DIMM_*x*	Memory modules (4)
FLOPPY	Diskette drive
FRONT PANEL	Front-panel switches and indicators
PASS	Password
POWER	System board power
SATA0	SATA hard drive0
SATA1	SATA hard drive1
SCSI LED	SCSI hard drive activity connector for SCSI controller card
I/O expansion cards	Expansion card slots: l PCI Express [x8] l 1: 32-bit/33-MHz PCI l 2: 32-bit/33-MHz PCI l 3: 32-bit/33-MHz PCI l PCI Express [x1]
PRI IDE	Primary IDE

Disabling a Forgotten Password

The system's software security features include a system password and an admin password, which are discussed in detail in "Using the System Setup Program" in your *User's Guide*. The password jumper enables these password features or disables them and clears any password(s) currently in use.
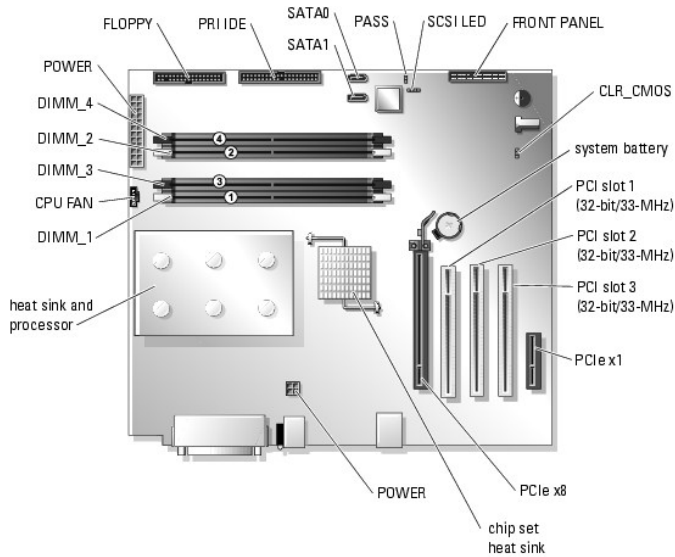
⚠ **CAUTION: See your *Product Information Guide* for complete information about safety precautions, working inside the computer, and protecting against electrostatic discharge.**

1. Turn off the system, 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 password jumper plug.

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

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

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

   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 admin password, you must install the jumper plug.

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

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

8. Install the password jumper plug.

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

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

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

11. Assign a new system and/or admin password.

    To assign a new password using the System Setup program, see "Using the System Setup Program" in your *User's Guide*.
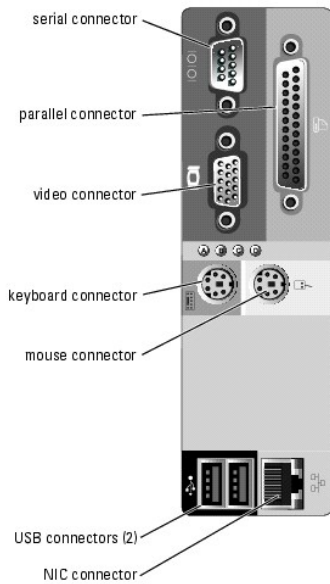
I/O Connectors
Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

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

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-1 defines the pin assignments for the connector.
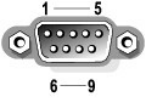
Figure B-2. Serial Connector Pin Numbers

Table B-1. Serial Connector Pin Assignments

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

Parallel Connector

The integrated parallel connector, intended primarily for use by printers that require data in parallel format, uses a 25-pin D-subminiature connector on the system's back panel. The default designation of the system's parallel connector is LPT1. If you add an expansion card containing a parallel connector configured as LPT1 (IRQ7, I/O address 378h), use the System Setup program to remap the integrated parallel connector. See "Using the System Setup Program" in the *User's Guide*. Figure B-3 illustrates the pin numbers for the parallel connector and Table B-2 defines the pin assignments for the connector.

Figure B-3. Parallel Connector Pin Numbers
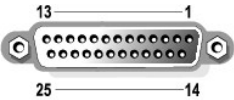
Table B-**2. Parallel Connector Pin Assignments**

Pin	Signal	I/O	Definition
1	STB#	I/O	Strobe
2	PD0	I/O	Printer data bit 0
3	PD1	I/O	Printer data bit 1
4	PD2	I/O	Printer data bit 2
5	PD3	I/O	Printer data bit 3
6	PD4	I/O	Printer data bit 4
7	PD5	I/O	Printer data bit 5
8	PD6	I/O	Printer data bit 6
9	PD7	I/O	Printer data bit 7
10	ACK#	I	Acknowledge
11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	AFD#	O	Automatic feed
15	ERR#	I	Error
16	INIT#	O	Initialize printer
17	SLIN#	O	Select in
18–25	GND	N/A	Ground

PS/2-Compatible Keyboard and Mouse Connectors

The PS/2-compatible keyboard and mouse cables attach to 6-pin, miniature DIN connectors. Figure B-4 illustrates the pin numbers for these connectors and Table B-3 defines the pin assignments for these connectors.

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

Table B-3. Keyboard and Mouse Connector Pin Assignments

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

Video Connector

You can attach a VGA-compatible monitor to the system's integrated video controller using a 15-pin high-density D-subminiature connector. Figure B-5 illustrates the pin numbers for the video connector and Table B-4 defines the pin assignments for the connector.

NOTE: Installing a video card automatically disables the system's integrated video controller.
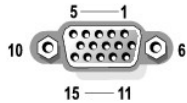
Figure B-5. Video Connector Pin Numbers

Table B-4. Video Connector Pin Assignments

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

USB Connector

The system's USB connector supports USB-compliant peripherals such as keyboards, mice, and printers and may also support USB-compliant devices such as diskette drives and CD drives. Figure B-6 illustrates the pin numbers for the USB connector and Table B-5 defines the pin assignments for the connector.

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

Figure B-6. USB Connector Pin Numbers

Table B-5. USB Connector Pin Assignments

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

Integrated NIC Connector

The system's integrated NIC functions as a separate network expansion card while providing fast communication between servers and workstations. Figure B-7 illustrates the pin numbers for the NIC connector and Table B-6 defines the pin assignments for the connector.

Figure B-7. NIC Connector
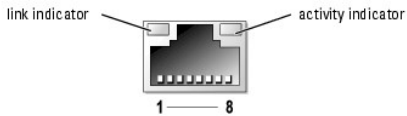
Table B-6. NIC Connector Pin Assignments

Pin	Signal	I/O	Definition
1	MX1+	O	Data out (+)
2	MX1−	O	Data out (−)
3	MX2+	I	Data in (+)
4	MX3+	N/A	No connection
5	MX3-	N/A	No connection
6	MX2−	I	Data in (−)
7	MX4+	N/A	No connection
8	MX4-	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.

- Use Category 5 or greater wiring and connectors.
- 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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Service Only Parts Replacement Procedures

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

Before You Begin

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

Recommended Tools

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

- #2 Phillips screwdriver
- Wrist grounding strap

Bezel

Removing the Bezel

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

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

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

3. Remove the screw that secures the bezel to the front panel. See Figure C-1.

4. Remove any 5.25-inch optical drives or tape drives to gain access to the bezel release tab. See "5.25-Inch Optical and Tape Drives" in "Installing Drives."

5. Release the bezel by pressing the three bezel release tabs. See Figure C-1.

   Press the bezel release tab next to the cover hinge first and then press the other two release tabs. See Figure C-1.

6. After pressing the three bezel release tabs, close the system half way and pull the bezel away from the system.

Figure C-1. Removing the Bezel

Installing the Bezel

1. Align the three bezel release tabs with the system's front panel.

2. Press the bezel onto the system until it snaps into place.

3. Install the screw that secures the bezel to the front panel. See Figure C-1.

4. Install any 5.25-inch optical or tape drives that you removed to gain access to the bezel release tab. See "5.25-Inch Optical and Tape Drives" in "Installing Drives."

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

6. Reconnect the system to the electrical outlet, and turn on the system.
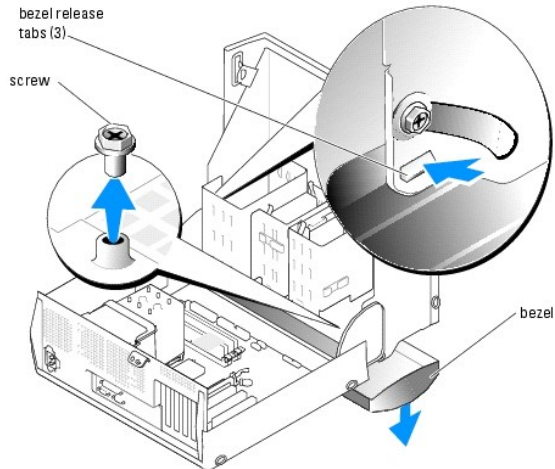
Control Panel

Removing the Control Panel

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

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

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

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

4. Disconnect the control panel cable that connects to the I/O panel. See Figure C-2.

5. Using a #2 Phillips screwdriver, remove the screw that secures the control panel to the front panel. See Figure C-2.

Figure C-2. Removing and Installing the Control Panel

I/O panel cable

screw

control panel
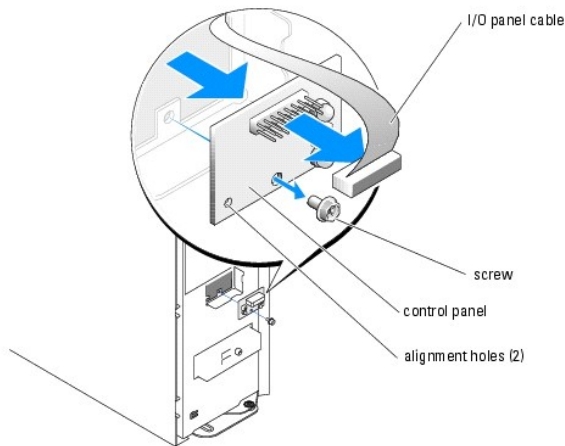
alignment holes (2)

Installing the Control Panel

1. Align the two alignment holes in the control panel with the two alignment pins on the front panel. See Figure C-2.

2. Lower the control panel onto the two alignment pins.

3. Using a #2 Phillips screwdriver, install the screw that secures the control panel to the front panel.

4. Connect the control panel cable from the I/O panel to the control panel. See Figure C-2.

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

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

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

## I/O Panel

Removing the I/O Panel

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

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

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

3. Disconnect the following cables from the I/O panel:

    l Control panel

    l Chassis intrusion switch

    l I/O panel

4. Using a #2 Phillips screwdriver, remove the screw that secures the I/O panel to the chassis. See Figure C-3.

Figure C-3. Removing and Installing the I/O Panel

5. Slide the I/O panel upward and remove the I/O panel from the system.

Installing the I/O Panel

1. Align the I/O panel with the mounting hole on the front panel. See Figure C-3.

2. Slide the I/O panel down until it stops.

3. Using a #2 Phillips screwdriver, install the screw that secures the I/O panel to the chassis.

4. Connect the following cables:

   l   I/O panel

   l   Chassis intrusion switch

   l   Control panel

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

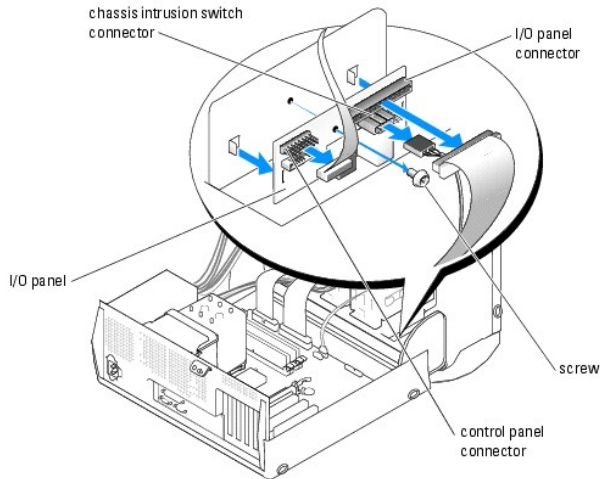6. Reconnect the system to the electrical outlet, and turn on the system.

Chassis Intrusion Switch

Removing the Chassis Intrusion Switch

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

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

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

3. Disconnect the chassis intrusion switch cable from the switch connector on the I/O panel. See Figure C-3.

4. Slide the chassis intrusion switch out of the securing bracket notch. See Figure C-4.

Figure C-4. Removing and Installing the Chassis Intrusion Switch

securing bracket notch

chassis intrusion switch

5. Remove the switch and its attached cable from the system.

Installing the Chassis Intrusion Switch

1. Align the chassis intrusion switch with the securing bracket notch. See Figure C-4.

2. Slide the switch into the securing bracket notch.

3. Connect the switch cable to the switch connector on the I/O panel. See Figure C-3.

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

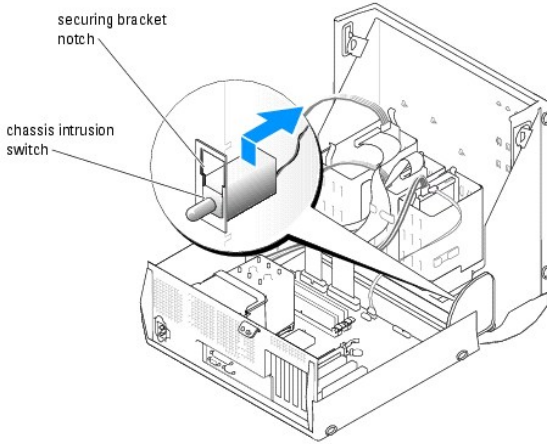5. Reconnect the system to the electrical outlet, and turn on the system.

System Board

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

⚠ CAUTION: The heat sink can get hot during operation. To avoid burns, ensure that the system has sufficient time to cool before removing the system board.

The system board and system board tray are removed and replaced as a single assembly.

Removing the System Board

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

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

3. Disconnect the following cables from the system board. See Figure A-3 in "Jumpers and Connectors":

   l Two power-supply cables from the POWER connectors

   l If applicable, diskette data cable from the FLOPPY connector

   l I/O panel cable from the FRONT PANEL connector

   l 5.25-inch device data cable from PRI IDE connector

   l Cooling fan from the CPU_FAN connector

   l If applicable, SATA hard-drive data cable(s) from SATA0 and SATA1 connector(s)

4. Remove all expansion cards and any attached cables. See "Removing an Expansion Card" in "Installing System Components."

5. Remove all memory modules. See "Removing a Memory Module" in "Installing System Components."

NOTE: Record the memory-module socket locations to ensure proper reinstallation of the memory modules.

NOTICE: The processor and heat sink can become extremely hot. Allow sufficient time for the processor and heat sink to cool before handling.

NOTICE: To prevent damaging the processor, do not pry the processor off the heat sink.

NOTICE: Use caution when removing and installing the processor. Bending or damaging the processor socket pins will permanently damage the system board.

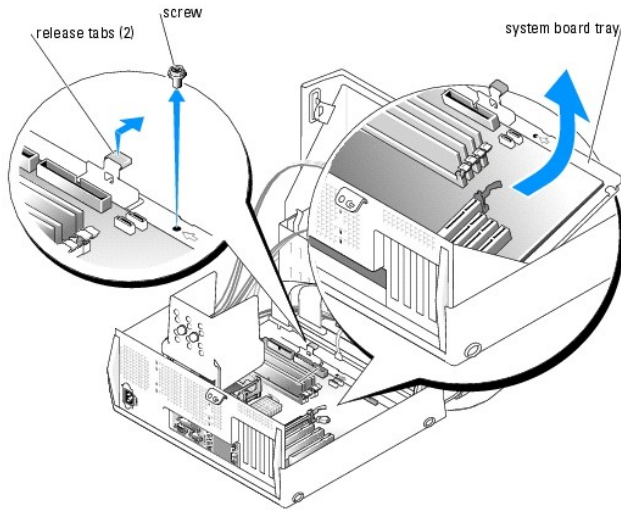6. Remove the processor. See "Replacing the Processor" in "Installing System Components."

7. Using a #2 Phillips screwdriver, remove the captive screw that secures the system board tray to the chassis. See Figure C-5.

Figure C-5. Removing and Installing the System Board

8. While pulling up on the system board tray release tab, slide the tray toward the front of the system and then remove the system board tray from the system.

9. Place the system board tray on a flat nonconductive surface.

Installing the System Board

1. While lowering the system board into the chassis, align the I/O connectors with the opening in the back panel.

2. Slide the system board backward until the system board snaps into place.

3. Using a #2 Phillips screwdriver, install the screw that secures the system board tray to the chassis. See Figure C-5.

NOTICE: To prevent damaging the processor, clean the heat sink to remove any thermal grease and then apply fresh thermal grease to the processor before installing the heat sink.

4. Install the processor. See "Replacing the Processor" in "Installing System Components."

5. Install the memory modules in the same sockets that they were removed from. See "Installing a Memory Module" in "Installing System Components."

6. Install the expansion cards and connect any cables. See "Installing an Expansion Card" in "Installing System Components."

7. Connect the following cables to the system board. See Figure A-3 in "Jumpers and Connectors":

   l Two power-supply cables from the POWER connectors

   l If applicable, diskette data cable from the FLOPPY connector

   l I/O panel cable from the FRONT PANEL connector

   l 5.25-inch device data cable from PRI IDE connector

   l Cooling fan from the CPU_FAN connector

        l   If applicable, SATA hard-drive data cable(s) from SATA0 and SATA1 connector(s)

8. Close the system. See "<u>Closing the System</u>" in "Troubleshootng Your System."

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

Introduction

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

● Other Documents You May Need

Your system includes system diagnostics, which checks for hardware problems (if the system can boot).

The following upgrade options are available:

- Processor
- Memory
- PCI or PCI-Express expansion cards
- SATA hard drives
- SCSI hard drives
- SCSI controller
- Optical drive
- Tape backup drive

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.

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

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

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

Indicators, Messages, and Codes

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- Front-Panel Indicators and Features
- Back-Panel Indicators and Features
- System Messages
- System Beep Codes
- Warning Messages
- Diagnostics 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:

- l   System indicators

- l   System messages

- l   Beep codes

- l   Warning messages

- l   Diagnostics messages

- l   Alert messages

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

Front-Panel Indicators and Features

Figure 2-1 shows the front-panel indicators for hard-drive activity and diagnostic purposes. The power button has a status indicator built into the button. Also, the optional diskette drive has an activity indicator.

Table 2-1 details the conditions associated with each front-panel indicator code. Table 2-2 details the conditions associated with the diagnostic indicator codes.

Figure 2-1. Front-Panel Indicators and Features
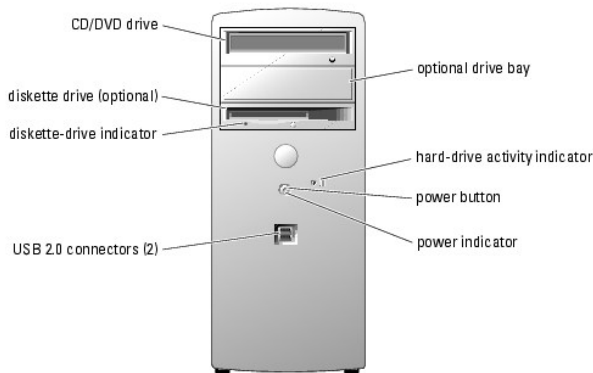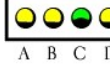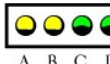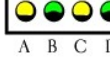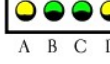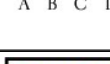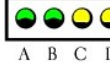
Table 2-1. Front-Panel Indicator Codes

Indicator Type	Activity Indicator	Indicator Code
Power	Off	The system is off.
	Amber blinking	The system is powering up. If the hard-drive indicator is off, the power supply may need to be replaced. If the hard-drive indicator is on, the system board is faulty. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2.
	Solid amber	The power supply is probably good. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2.
	Solid green	Indicates that the system is powered on.

	Green blinking	The system is in a low power state. Check the diagnostic indicators to see if the specific problem is identified. See Table 2-2.
Diskette drive	Green blinking	Indicates diskette-drive activity.
Hard drive	Green blinking	Indicates hard-drive activity.

The front panel also incorporates two USB 2.0 connectors. See Figure 2-1.

Table 2-2. Diagnostic Indicator Codes

Code	Causes	Corrective Action
A B C D	A possible processor failure has occurred.	Reinstall the processor. See "Processor" in "Installing System Components" and restart the system.
A B C D	Memory modules are detected, but a memory failure has occurred.	Ensure that the memory modules are proper installed. See "Memory Module Installation Guidelines." Ensure that all the connector tabs are locked. Remove and reinstall all memory modules. See "System Memory" in "Installing System Components." Restart the system.
A B C D	A possible expansion-card failure has occurred.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
A B C D	A possible video card failure has occurred.	Reinstall the video card and restart the system. See "Expansion Cards" in "Installing System Components." If the problem still exists, install a video card that you know works and restart the system. If the problem persists, see "Getting Help."
A B C D	A possible diskette or hard-drive failure has occurred.	Check all the power and data cable connections. See "Troubleshooting a Diskette Drive" or the appropriate hard-drive troubleshooting procedure ("Troubleshooting a SCSI Hard Drive" or "Troubleshooting a SATA Hard Drive") in "Troubleshooting Your System."
A B C D	A possible USB failure has occurred.	Check cable connections, reinstall all USB devices, and restart the system.
A B C D	No memory modules are detected.	Remove and reinstall all memory modules. See "System Memory" in "Installing System Components." Ensure that the memory modules are proper installed. See "Memory Module Installation Guidelines." Ensure that all the connector tabs are locked. Restart the system.
A B C D	A system board failure has occurred.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
A B C D	A possible system board resource and/or hardware failure has occurred.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Battery." If the problem persists, see "Troubleshooting System Memory." If the problem persists, see "IRQ Assignment Conflicts" in "Finding Software Solutions." If the problem persists, see "Getting Help."
A B C D	A possible expansion card failure has occurred.	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the problem persists, see "IRQ Assignment Conflicts" in "Finding Software Solutions." If the problem persists, see "Getting Help."
A B C D	Other failure has occurred.	Ensure that the cables are properly connected from the diskette drive, hard drive, CD drive, and DVD drive to the system board. If the problem persists, see "Getting Help."
A B C D	The system is in a normal operating condition after POST.	None.

🟡 = yellow	
🟢 = green	
⚪ = off	

Back-Panel Indicators and Features

Figure 2-2 shows the back-panel indicators and features. Figure 2-3 shows the indicators for the integrated network adapter and Table 2-2 details the conditions associated with the indicator codes.

Figure 2-2. Back-Panel Indicators and Features
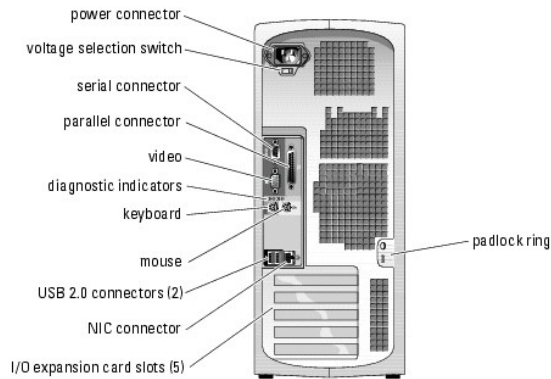
Figure 2-3. NIC Indicators
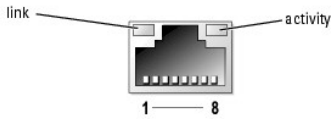
Table 2-3. NIC Indicators

Indicator Type	Indicator Code	Description
Activity	Off	When off at the same time that the link indicator is off, the NIC is not connected to the network or the NIC is disabled in the System Setup screen. See "Using the System Setup Program" in the *User's Guide*.
	Blinking	Indicates that network data is being sent or received.
Link	Off	When off at the same time that the activity indicator is off, the NIC is not connected to the network or the NIC is disabled in the System Setup screen. See "Using the System Setup Program" in the *User's Guide*.
	Yellow	1000-Mbps connection
	Orange	100-Mbps connection
	Green	10-Mbps connection

System Messages

System messages appear on the screen to notify you of a possible problem with the system. Table 2-4 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 2-4, check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-4. System Messages

Message	Causes	Corrective Actions
A filename cannot contain any of the following characters: \ / : * ? " < > |		Do not use these characters in filenames.
A required .DLL file was not found	The program that you are trying to open is missing an essential file.	Remove and then reinstall the program. See the program documentation for installation instructions.
Alert! Cover was previously removed.	The system was opened.	Information only. To reset the chassis intrusion switch, see "Using the System Setup Program" in your *User's Guide*.
Alert! CPU 0 fan failure.	The cooling fan is faulty or the fan assembly is not installed correctly.	Ensure that the processor cooling shroud is properly installed. See "Cooling Fan" in "Installing System Components."
Alert! Error initializing PCI Express slot n (or bridge).	The system encountered a problem while trying to configure a PCI Express expansion card	See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Alert! OS Install Mode enabled. Amount of available memory limited to 256MB	The **OS Install Mode** option in the System Setup program is set to **On**. This limits the amount of available memory to 256 MB because some operating systems will not complete installation with more than 2 GB of system memory.	After the operating system is installed, enter the System Setup program and set the **OS Install Mode** option to **Off**. See your *User's Guide* for details.
Alert! Previous fan failure.	The fan caused errors the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are properly installed and operating correctly.
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The system failed to complete the boot routine three consecutive times for the same error.	See "Getting Help."
Alert! Previous Processor Thermal Failure	The processor overheated the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are properly installed and operating correctly. Also, ensure that the processor heat sink is properly installed. See "Processor" in "Installing System Components."
Alert! Previous Shutdown Due to Thermal Event	The processor or hard drive overheated the last time the system was used.	Ensure that nothing is blocking the airflow vents and that all fans are working correctly. Also, ensure that the processor heat sink is properly installed. See "Processor" in "Installing System Components."
Alert! Uncorrectable Memory Error Previously Detected	One or more memory modules might be improperly seated or faulty, or the system board may be faulty.	See "Troubleshooting System Memory" and "Troubleshooting Your System." If the problem persists, see "Getting Help."
Attachment failed to respond	The diskette or hard-drive controller cannot send data to the associated drive.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
Bad command or file name		Ensure that you have spelled the command correctly, have put spaces in the proper place, and have used the correct pathname.
Bad error-correction code (ECC) on disk read	The diskette or hard-drive controller detected an uncorrectable read error.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
bb/dd/f: Error allocating IRQ for PCI Device bb/dd/f: Error allocating I/O BAR for PCI Device bb/dd/f: Error allocating Mem BAR for PCI Device bb/dd/f: Error allocating PMem BAR for PCI Device bb/dd/f: Error allocating UMB for PCI Device where bb is the bus number, dd is the device number, and f is the function number. **NOTE:** bb, dd, and f are hexadecimal numbers.	The system encountered a problem while trying to configure an expansion card or integrated on-board devices.	If the device number points to an expansion card, the card can be removed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System." If the device number points to a an on-board device, disable the device. See "Using the System Setup Program" in your *User's Guide* for details.
Controller has failed	The hard drive or the associated controller is defective.	See "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
Data error	The diskette drive or hard drive cannot read the data.	For the operating system, run the appropriate utility to check the file structure of the diskette drive or hard drive. See your operating system documentation for information on running these utilities.
Decreasing available memory	One or more memory modules might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See "System Memory" in "Installing System Components."

		See "Troubleshooting System Memory" in "Troubleshooting Your System."
`Diskette drive 0 seek failure`	A cable might be loose or the system configuration information might not match the hardware configuration.	See "Troubleshooting a Diskette Drive" in "Troubleshooting Your System."
`Diskette read failure`	The diskette might be defective, or a cable might be loose.	If the diskette-drive indicator turns on, try a different disk. See "Troubleshooting a Diskette Drive" in "Troubleshooting Your System."
`Diskette subsystem reset failed`	The diskette drive controller might be faulty.	Run the system diagnostics. See "Running System Diagnostics."
`Diskette write protected`	The diskette is write-protected.	Slide the write-protect notch to the open position.
`Drive not ready`	No diskette is in the drive.	Put a diskette in the drive.
`Gate A20 failure`	Faulty keyboard controller (faulty system board).	See "Getting Help."
`General failure`	The operating system is unable to carry out the command.	This message is usually followed by specific information. Take the appropriate action to resolve the problem.

`Hard-disk configuration error`
`Hard-disk controller failure`
`Hard-disk drive failure`
	The hard drive failed initialization.	Run the system diagnostics. See "Running System Diagnostics."
		
		See "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."

`Insert bootable media`	The operating system is trying to boot from a nonbootable diskette or CD.	Insert a bootable diskette or CD.
`Invalid configuration information - please run SETUP program`	The system configuration information does not match the hardware configuration.	Enter the System Setup program and correct the system configuration information. See your *User's Guide* for details.

`Keyboard Controller Failure`
 	
`KeyBoard Stuck Key Failure`
 	
`Keyboard failure`
	A cable or connector might be loose, or the keyboard or keyboard/mouse controller might be faulty.	See "Troubleshooting the Keyboard" in "Troubleshooting Your System."

`Memory address line failure at` *address*`, read` *value* `expecting` *value*	A memory module might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See "Troubleshooting System Memory" in "Troubleshooting Your System."
`Memory allocation error`	The software you are attempting to run is conflicting with the operating system, another program, or a utility.	Turn off the system, wait 30 seconds, restart the system, and then try to run the program again. If the error message appears again, see the software documentation for additional troubleshooting suggestions.
`Memory data line failure at` *address*`, read` *value* `expecting` *value* `Memory double word logic failure at` *address*`, read` *value* `expecting` *value* `Memory odd/even logic failure at` *address*`, read` *value* `expecting` *value* `Memory write/read failure at` *address*`, read` *value* `expecting` *value*	A memory module might be faulty or improperly seated.	Reinstall the memory modules and, if necessary, replace them. See "Troubleshooting System Memory" in "Troubleshooting Your System."
`Memory size in CMOS invalid`	The amount of memory recorded in the system configuration information does not match the memory installed in the system.	Restart the system. If the error message appears again, see "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
`No boot device available`	The system cannot find the diskette or hard drive.	If the diskette drive is your boot device, ensure that a bootable disk is in the drive. If the hard drive is your boot device, ensure that the hard drive is installed, properly seated, and partitioned as a boot device. Enter the System Setup program and verify the boot sequence information. See your *User's Guide* for details.
`No boot sector on hard-disk drive`	The system configuration information in the System Setup program might be incorrect.	Enter the System Setup program and verify the system configuration information for the hard drive. See your *User's Guide* for details. If the message continues to appear after verifying the information in the System Setup program, the operating system might have been corrupted. Reinstall the operating system. See your operating system documentation for reinstallation information.

`No timer tick interrupt`	A chip on the system board might be malfunctioning.	Run the system diagnostics. See "Running System Diagnostics."
`Non-system disk or disk error`	The diskette in the diskette drive or your hard drive does not have a bootable operating system installed on it.	Replace the diskette with one that has a bootable operating system or remove the diskette, and then restart the system. If the problem persists, see the appropriate hard drive troubleshooting procedure: "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System." If the problem persists, see "Getting Help."
`Not a boot diskette`	The operating system is trying to boot from a diskette that does not have a bootable operating system installed on it.	Insert a diskette that has a bootable operating system.
`Not enough memory or resources. Close some programs and try again`	You have too many programs open.	Close all windows and open the program that you want to use. In some cases, you might have to restart your system to restore system resources. If so, try opening the program that you want to use first
`Operating system not found`		See "Getting Help."
`Read fault`	The operating system cannot read from the diskette or hard drive, the system could not find a particular sector on the disk, or the requested sector is defective.	See "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
`Requested sector not found`	The operating system cannot read from the diskette or hard drive, the system could not find a particular sector on the disk, or the requested sector is defective.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
`Reset failed`	The disk reset operation failed.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."

`Sector not found`
 	
`Seek error`
	A faulty diskette drive or hard drive.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."

`Shutdown failure`	A chip on the system board might be malfunctioning.	Run the system diagnostics. See "Running System Diagnostics."
`The file being copied is too large for the destination drive`	The file that you are trying to copy is too large to fit on the disk.	Try copying the file to a blank diskette or using a larger capacity disk.
`Time-of-day clock stopped`	The battery might be faulty.	See "Troubleshooting the System Battery" in "Troubleshooting Your System."
`Time-of-day not set`	The time or date stored in the System Setup program does not match the system clock.	Enter the System Setup program and correct the **Date** and **Time** options. See your *User's Guide* for details. If the problem persists, see "Troubleshooting the System Battery" in "Troubleshooting Your System."
`Timer chip counter 2 failed`	A chip on the system board might be malfunctioning.	Run the system diagnostics. See "Running System Diagnostics."
`NOTICE: The [primary/secondary/primary serial] IDE [master/slave] hard drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem.`	During initial start-up, the drive detected possible error conditions.	When your system finishes booting, immediately back up your data and replace your hard drive. See "Hard Drives" in "Installing drives." If no replacement hard drive is immediately available and the drive is not the only bootable drive, enter the System Setup program and change the appropriate drive setting to **Off**. See your *User's Guide* for details. Then remove the hard drive from the system.
`Write fault`	The operating system cannot write to the diskette drive or hard drive.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
`Write fault on selected drive`	The operating system cannot write to the diskette drive or hard drive.	See "Troubleshooting a Diskette Drive" or "Troubleshooting a SATA Hard Drive" and "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System."
`x:\ is not accessible. The device is not ready`	The diskette drive cannot read the diskette.	Insert a diskette into the drive and try again.

System Beep Codes

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

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

If a beep code is emitted, write down the series of beeps and then look it up in Table 2-5. If you are unable to resolve the problem by looking up the meaning

of the beep code, use system diagnostics to identify the possible cause. If you are still unable to resolve the problem, see "Getting Help."

Table 2-5. Server Module Beep Codes

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

Warning Messages

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

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

Diagnostics Messages

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

Back to Contents Page

Finding Software Solutions

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- Before You Begin
- Troubleshooting Errors and Conflicts

Software problems can be caused by:

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

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

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

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

Before You Begin

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

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

Troubleshooting Errors and Conflicts

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

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

Input Errors

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

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

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. IRQ Assignment Defaults

IRQ Line	Assignment
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	Serial port 2 (COM2 and COM4)
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	*Available*
IRQ6	Diskette drive controller

IRQ7	Parallel port
IRQ8	Real-time clock
IRQ9	ACPI functions (used for power management)
IRQ10	*Available*
IRQ11	*Available*
IRQ12	PS/2 mouse port unless the mouse is disabled through the System Setup program
IRQ13	Math coprocessor
IRQ14	IDE CD drive controller
IRQ15	*Available*

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.

Running System Diagnostics

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- Using Server Administrator Diagnostics
- System Diagnostics Features
- When to Use the System Diagnostics
- Running the System Diagnostics
- 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 or the *Dell OpenManage Server Assistant for PowerEdge SC Products* CD. For additional information, see the *Dell OpenManage Server Administrator User's Guide.*

System Diagnostics Features

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

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

When to Use the System Diagnostics

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

Running the System Diagnostics

The system diagnostics 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 for PowerEdge SC Products* CD.

> **NOTICE:** Use the system diagnostics to test only your Dell 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 for PowerEdge SC Products* CD. See "Using the Dell OpenManage Server Assistant for PowerEdge SC Products 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.

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:

l   Two lines at the top of the screen identify the diagnostics utility, the version number, and the system's service tag number.

l   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.

l   The right side of the screen under **Devices for Highlighted Group** lists the specific devices within a particular test group.

l   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™ SC420 Systems Installation and Troubleshooting Guide

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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: 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 1-1.

Table 5-1. Start-Up Routine Indications

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

Opening the System

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

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

2. Press the power button to ground the system board.

3. If you have installed a padlock through the padlock ring on the back panel, remove the padlock.

4. Lay the system on its side as shown in Figure 5-1.

⊘ **NOTICE:** Ensure that sufficient space exists to accommodate the open cover—at least 30 cm (1 ft) of desktop space.

5. Open the system by pushing the buttons on both ends and lifting the cover open.

Closing the System

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

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

3. Close the system cover.

   a. Rotate the cover down. See Figure 5-1.

   b. Press down on the cover until the cover release latches are fully engaged.

4. If applicable, install the padlock.

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

   After you open and close the cover, the chassis intrusion detector, if enabled, causes the following message to appear on the screen at the next computer start-up:

   ```
   ALERT! Cover was previously removed.
   ```

6. To reset the chassis intrusion detector, press <Enter>. See your *User's Guide* for details.

NOTE: If a setup password has been assigned by someone else, contact your network administrator for information on resetting the chassis intrusion detector.

Figure 5-1. Opening and Closing the System

system release latch (2)
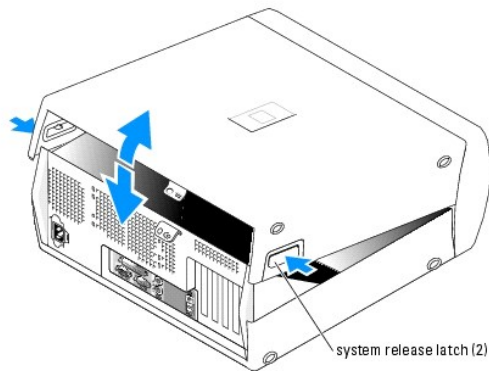
Checking the Equipment

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 and Figure 2-2 for the back panel connectors on your system.

Troubleshooting the Video Subsystem

Problem

l   Monitor is not working properly.

Action

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

2. If the problem persists, replace the monitor with a known good monitor.

3. If the problem persists, see "Getting Help."

Troubleshooting the Keyboard

Problem

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

Action

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

2. Press each key on the keyboard, and examine the keyboard and its cable for signs of damage.

3. Swap the faulty keyboard with a working keyboard.

   If the problem is resolved, replace the faulty keyboard. See "Getting Help."

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

Troubleshooting the Mouse

Problem

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

Action

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

   If the test fails, continue to the next step.

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

   If the mouse is not damaged, go to step 4.

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

3. Swap the faulty mouse with a working mouse.

   If the problem is resolved, replace the faulty mouse. See "Getting Help."

4. 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

l   Error message indicates a problem with a serial or parallel port.

l   Device connected to a serial or parallel port is not operating properly.

Action

1. Enter the System Setup program and ensure that the serial port(s) and parallel port are 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 the appropriate procedure—"Troubleshooting a Serial I/O Device" or "Troubleshooting a Parallel Printer."

Troubleshooting a Serial I/O Device

Problem

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

Action

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

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

    If the problem is resolved, replace the interface cable. 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 Parallel Printer

Problem

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

Action

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

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

    If the problem is resolved, replace the interface cable. See "Getting Help."

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

4. Turn on the system and the printer.

    If the problem is resolved, replace the printer. See "Getting Help."

    If the problem persists, see "Getting Help."

Troubleshooting a USB Device

Problem

l System message indicates a problem with a USB device.

l Device connected to a USB port is not operating properly.

Action

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

2. Turn off any USB devices.

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

4. Turn on the reconnected device.

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

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

   If the problem is resolved, replace the interface cable. See "Getting Help."

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

7. Turn on the USB device.

   If the problem is resolved, replace the USB device. See "Getting Help."

   If the problem persists, see "Getting Help."

Troubleshooting a NIC

Problem

l NIC cannot communicate with network.

Action

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

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

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

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

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

   l Change the autonegotiation setting, if possible.

   l Use another connector on the switch or hub.

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

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

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

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

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

Inside the System

In Figure 5-2, the system cover is opened to provide an interior view of the system.

Figure 5-2. Inside the System
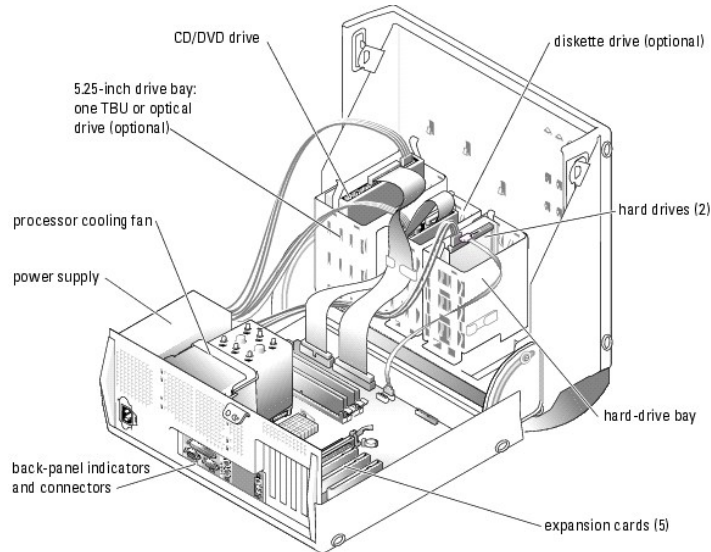
The system board can accommodate one processor, five expansion cards (three 32-bit, 33-MHz PCI, one 2.5-GHz PCI-Express [x1] and one 2.5-GHz PCI-Express [x8]), and four 400-MHz or 533-MHz DDR II SDRAM memory modules upgradable to 4 GB.

The drive bays provide space for up to two 1-inch SATA drives with the integrated SATA controller or two SCSI hard drives. The SCSI hard drives must be connected to a controller card. They also provide space for an optical drive, an optional diskette drive, or an optional tape backup unit (TBU). Power is supplied to the system board and internal peripherals through a single nonredundant power supply.

Troubleshooting a Wet System

Problem

- l   Liquid spilled on the system.
- l   Excessive humidity.

Action

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

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

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

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

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

5. If SCSI hard drives are installed, install the controller card. 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 system does not start properly, see "Getting Help."

8. 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."

9. 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

l   System was dropped or damaged.

Action

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

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

2. Ensure that the following components are properly installed:

   l   Expansion card(s)

   l   Processor

   l   Memory modules

   l   Hard drives, optical drives, and TBU

   l   Fan

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 "Getting Help."

Troubleshooting the System Battery

Problem

l   System message indicates a problem with the battery.

l   System Setup program loses system configuration information.

l   System date and time do not remain current.

📝 **NOTE:** If the system is turned off for long periods of time (for weeks or months), the NVRAM may lose its system configuration information. This situation is caused by a defective battery.

Action

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

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

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

4. Enter the System Setup program.

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

Problem

l   Power indicator is not lit.

Action

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

1. Ensure that the power cable is attached to the system and the cable is connected to an electrical outlet.

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

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

4. Locate the power supply.

5. Ensure that the power supply is properly installed by removing and reinstalling it. See "Power Supply" 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 "Front-Panel Indicators and Features" in "Indicators, Messages, and Codes."

6. If the problem is resolved, close the system. See "Closing the System."

    If the problem persists, remove the faulty power supply. See "Removing the Power Supply" in "Installing System Options."

7. Install a new power supply. See "Installing the Power Supply" in "Installing System Options."

    If the problem persists, see "Getting Help."

Troubleshooting System Cooling Problems

Problem

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

Action

Ensure that none of the following conditions exist:

l   Ambient temperature is too high.
l   External airflow is obstructed.
l   Cables inside the system obstruct airflow.
l   Processor heat sink is not installed properly. See "Processor" in "Installing System Options."
l   The processor cooling fan is not installed properly or has failed. See "Troubleshooting a Fan."

Troubleshooting a Fan

Problem

    ι   A fan-related error message.

Action

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

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

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

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

4. Ensure that the power cable is firmly attached to the fan power connector. See Figure A-3 in "Jumpers and Connectors."

    📝 **NOTE:** Wait 30 seconds for the system to recognize the fan and determine whether it is working properly.

5. If the problem is not resolved, install a new fan. See "Cooling Fan" in "Installing System Components."

6. 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

    ι   Error message during POST.
    ι   Faulty memory module.
    ι   Faulty system board.

Action

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

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

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

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

4. Ensure that the memory modules are properly installed. See "Memory Module Installation Guidelines" and "Installing a Memory Module" in "Installing System Options."

5. Remove all of the memory modules. See "Removing a Memory Module" in "Installing System Options."

📝 **NOTE:** Record the DIMM socket so that the memory modules can be properly reinstalled in step 9.

6. Install the suspected faulty memory module in DIMM_1.

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

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

9. If no memory errors occur during POST, repeat step 2 and step 3, and step 6 through step 8 for all the suspected faulty memory modules.

10. If memory errors occur, replace the faulty memory modules.

11. Reinstall the memory modules. See "Installing a Memory Module" in "Installing System Options."

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

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

14. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.

   If the problem persists, see "Getting Help."

Troubleshooting a Diskette Drive

Problem

l   Error message indicates a diskette drive problem.

Action

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

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

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

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

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

5. Ensure that the diskette drive interface cable is securely connected to the diskette drive and the system board. See Figure A-3.

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

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

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

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

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

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

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

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

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

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

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

   If the tests fail, see "Getting Help."

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

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

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

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

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

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

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

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

Troubleshooting a CD Drive

Problem

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

Action

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

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

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

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

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

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

6. Ensure that the CD interface cable is securely connected to the CD drive and to the controller.

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

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

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

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

Troubleshooting a SCSI Hard Drive

Problem

- Device driver error.
- Hard drive not recognized by the system.

Action

⚠️ **CAUTION: 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. Restart the system and enter the SCSI configuration utility.

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

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

3. Ensure that the required device drivers are installed and configured correctly. See the *Dell OpenManage Server Assistant for PowerEdge SC Products* CD.

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

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

6. Ensure that the hard-drive interface cable is properly connected between the drive and the controller card. See the documentation supplied with the controller card.

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

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

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

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

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

    If the problem persists, continue to the next step.

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

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

    If the problem persists, see "Getting Help."

Troubleshooting a SATA Hard Drive

Problem

- l Faulty hard drive
- l Damaged or improperly connected hard-drive cables

Action

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

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

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

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

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

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

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

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

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

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

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

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

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

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

    If the problem persists, see "Getting Help."

Troubleshooting a Hard Drive in a RAID Configuration

Problem

- Device driver error
- Damaged or improperly connected hard-drive cables

Action

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

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

1. Enter the System Setup program, select **Drive Controller**., and ensure that **RAID On** is enabled.

   If your system is running Red Hat® Linux, select **Drive Controller**, and ensure that **RAID Off** is enabled.

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

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

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

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

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

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

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

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

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

    If the problem persists, continue to the next step.

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

12. If possible, restore the files from the backup drive. See the operating system documentation.

13. Exit the RAID configuration utility and restart your system.

    If the problem persists, see "Getting Help."

Troubleshooting Expansion Cards

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

Problem

- l Error message indicates a problem with an expansion card.
- l Expansion card performs incorrectly or not at all.

Action

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

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

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

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

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

   If the problem persists, go to the next step.

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

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

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

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

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

12. Run the appropriate online diagnostic test.

    If the tests fail, see "Getting Help."

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

    a. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
    b. Open the system. See "Opening the System."
    c. Reinstall one of the expansion cards.
    d. Close the system. See "Closing the System."
    e. Run the appropriate diagnostic test.

       If the tests fail, see "Getting Help."

Troubleshooting the Processor

Problem

- l Error message indicates a processor problem.
- l A heat sink is not installed for the processor.

Action

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

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

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

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

⬤ **NOTICE:** Use caution when removing and installing the processor. Bending or damaging the processor socket pins or dropping any type of foreign material into the processor slot will permanently damage the system board.

4. Ensure that the processor and heat sink are properly installed. See "Processor" 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.

   If the problem persists, see "Getting Help."

Installing System Components

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- Expansion Cards
- Power Supply
- Cooling Fan
- System Memory
- Processor
- System Battery

This section describes how to install the following system components:

l   Expansion cards

l   Power supply

l   Cooling fan

l   System memory

l   Processor

l   System battery

Expansion Cards

The system supports up to five half-length PCI expansion cards (three 32-bit, 33-MHz PCI, one 2.5-GHz PCI Express [x1], and one 2.5-GHz PCI Express [x8]). See Figure A-3 for the location of the expansion card slots.

📝 **NOTE:** The PCI slots do not support 3.3-V expansion cards. Only 5-V PCI expansion cards are supported.

Installing an Expansion Card

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

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

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

3. Press the lever on the card retention arm and raise the retention arm. See Figure 6-1.

Figure 6-1. Installing an Expansion Card
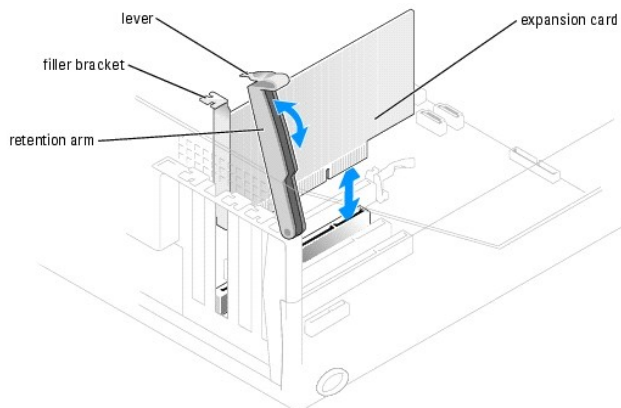
4. If you are installing a new card, remove the filler bracket.

📝 **NOTE:** Keep this bracket in case you need to remove the expansion card. Filler brackets must be installed over empty expansion-card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

5. Prepare the card for installation.

    See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your system.

    📷 **NOTE:** Some NICs automatically start the system when they are connected to a network.

6. Place the card-edge connector in the expansion-card connector and press down firmly. Ensure that the card is fully seated in the slot.

7. Lower the retention arm, ensuring that:

    a. The tops of all cards and filler brackets are flush with the alignment bar.

    b. The notch in the top of the card or filler bracket fits around the alignment guide.

8. Press the retention arm into place, securing the card(s) in the system.

    ⊘ **NOTICE:** Do not route card cables over or behind the cards. Cables routed over the cards can prevent the system cover from closing properly or cause damage to the equipment.

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

    See the documentation for the card for information about the card's cable connections.

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

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

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

Removing an Expansion Card

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

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

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

3. Press the lever on the retention arm and raise the retention arm. See Figure 6-1.

4. If necessary, disconnect any cables from the card.

5. Grasp the card by its top corners, and ease it out of its connector.

6. If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

    📷 **NOTE:** Filler brackets must be installed over empty expansion card slots to maintain FCC certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.

7. Lower the retention arm and press it into place, securing the remaining card(s) in the system. See Figure 6-1.

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

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

10. Remove the card's device driver from the operating system.

Power Supply

Removing the Power Supply

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

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

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

3. Disconnect the following cables:
   - l P1 connector to the system board
   - l P3 and P5 connectors to the SCSI or SATA drives
   - l P7 connector to the diskette drive (if applicable)
   - l P8 connector to the optical drive (if applicable)

4. Using a #1 Phillips screwdriver, loosen the two Phillips screws that secure the power supply to the back panel.

5. While pressing the power supply release button, slide the power supply toward the front of the system and then away from the chassis. See Figure 6-2.

Figure 6-2. Removing the Power Supply and Cooling Fan

Installing the Power Supply

1. Prepare the new power supply for installation.

2. Align the power supply mounting holes with the mounting holes on the back panel.

3. Slide the power supply toward the back panel until it snaps into place.

4. Using a #1 Phillips screwdriver, install the two Phillips screws that secure the power supply to the back panel.

5. Reconnect the following cables:
   - l P1 and P2 connectors to the system board
   - l P3 and P5 connectors to the SATA drives
   - l P7 connector to the diskette drive (if applicable)
   - l P8 connector to the optical drive (if applicable)

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

Cooling Fan

The processor cooling fan shroud is part of the cooling fan assembly. The fan and shroud are replaced as a unit.

Removing the Cooling Fan

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

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

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

3. Rotate the cooling shroud toward the back panel.

4. Disconnect the fan's power cable from the system board. See Figure A-3.
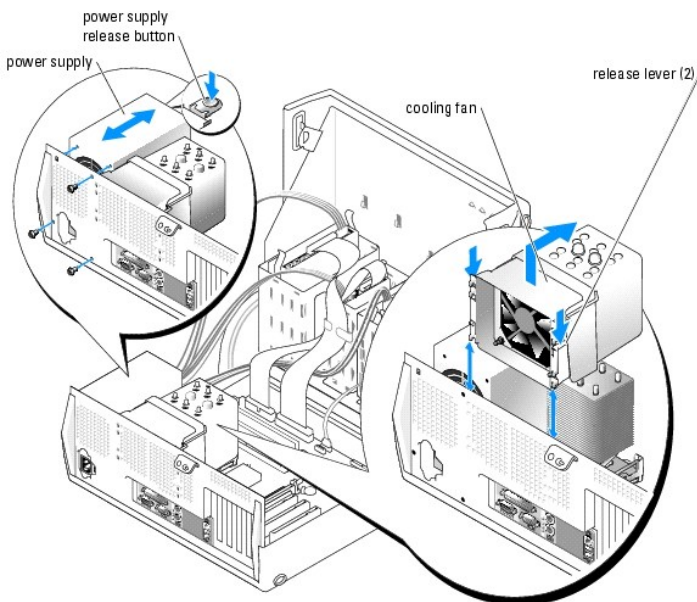
5. Using a #1 Phillips screwdriver, loosen the two Phillips screws that secure the power supply to the back panel.

6. While pressing the power supply release button, slide the power supply 2 inches (5.08 cm) toward the front of the system.

7. While pressing the two release levers on the cooling fan assembly toward the center of the system, slide the fan assembly up and out of the system. See Figure 6-2.

Replacing the Cooling Fan

1. Align the eight securing tabs of the processor cooling fan with the mounting holes in the back panel. See Figure 6-2.

2. Lower the fan assembly into the holes in the back panel and slide the assembly down until the assembly snaps into place. See Figure 6-2.

3. Connect the fan's power cable to the system board. See Figure A-3.

4. Align the power supply mounting holes with the mounting holes on the back panel.

5. Slide the power supply toward the back panel until it snaps into place.

6. Using a #1 Phillips screwdriver, install the two Phillips screws that secure the power supply to the back panel.

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

System Memory

See Figure A-3 for the location of the four memory module connectors. The four memory module connectors on the system board can accommodate from 256 MB to 4 GB of 400/533-MHz unbuffered ECC DDR II memory modules.

Memory Module Upgrade Kits

The system is upgradable to 4 GB by installing combinations of 256-MB, 512-MB, or 1-GB 400-MHz or 533-MHz unbuffered ECC DDR II memory modules. You can purchase memory upgrade kits from Dell.

Memory Module Installation Guidelines

- If only one memory module is installed, it must be installed in connector DIMM_1.

- If only one memory module is installed in connector DIMM_1, its capacity must be 256 MB.

- If more than one memory module is installed, the memory modules should be installed in *pairs of matched memory size, speed, and technology*.

- Memory modules should be installed in ordered pairs in connectors DIMM_1 and DIMM_2, and then DIMM_3 and DIMM_4.

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 unregistered or unbuffered ECC DDR II memory modules.

Table 6-1 illustrates sample memory configurations. See "Memory Module Installation Guidelines" for detailed information.

Table 6-1. Sample Memory Configurations

Total Memory	DIMM_1	DIMM_2	DIMM_3	DIMM_4
256 MB	256 MB	none	none	none
512 MB	256 MB	256 MB	none	none
1 GB	256 MB	256 MB	256 MB	256 MB
1 GB	512 MB	512 MB	none	none
1 GB	1 GB	none	none	none
2 GB	512 MB	512 MB	512 MB	512 MB
2 GB	1 GB	1 GB	none	none
3 GB	1 GB	1 GB	512 MB	512 MB
4 GB	1 GB	1 GB	1 GB	1 GB

Addressing Memory With 4-GB Configurations (Microsoft® Windows® Only)

Your system supports a maximum of 4 GB of memory using four 1-GB memory modules. Current operating systems can use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is slightly less than 4 GB.

NOTE: Depending on the type of PCI/PCIe expansion cards that are installed in your system, your system may only support a maximum of 3.4 GB of memory or less.

Certain components within the system require address space in the 4-GB range. Any address space reserved for these components cannot be used by system memory.

The following components require address space:

  l System ROM

  l Advanced Programmable Interrupt Controllers (APIC)

  l Integrated PCI devices (such as NICs) and SCSI controllers

  l PCI expansion cards

At start-up, the BIOS identifies the components that require address space. The BIOS dynamically calculates the amount of reserved address space required. The BIOS then subtracts the reserved address space from 4 GB to determine the amount of usable space.

  l If the total installed system memory is less than the usable space, all installed system memory is available for use only by the operating system.

  l If the total installed system memory is equal to or greater than the usable address space, a small portion of installed memory is available for use by the operating system.

Installing a Memory Module

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

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

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

3. Press on the securing clip at each end of the memory module connector. See Figure 6-3.

4. Align the memory module's edge connector with the alignment key in the connector.

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

5. Insert the module into the connector, and carefully press each end of the module into place.

Figure 6-3. Installing a Memory Module

cutout

memory module
securing clips (2)

alignment key

notch
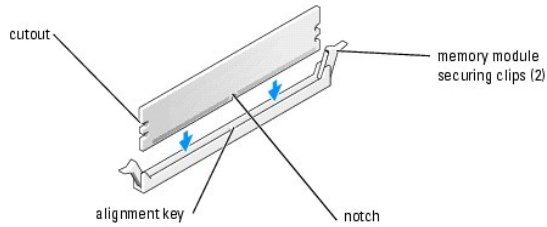
6. Pull up on the securing clips to lock the module into place.

   If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.

   When the memory module is properly seated in the connector, the securing clips on the memory module socket should align with the securing clips on the other connectors with memory modules installed.

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

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

   The system detects that the new memory does not match the existing configuration information and generates the following message:

   ```
   The amount of system memory has changed.
   Strike the F1 key to continue, F2 to run the setup utility
   ```

9. Press <F2> to enter the System Setup program and check the value for **Memory Info**. See your *User's Guide* for detailed information.

   The system should have changed the value for **Memory Info** to reflect the newly installed memory. Verify the new value. If it is correct, skip to step 13.

10. If the memory value is incorrect, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.

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

12. Ensure that the installed memory modules are seated properly in their connectors, and repeat step 6 through step 9.

13. When the **Memory Info** value is correct, press <Esc> to exit the System Setup program.

14. Run the system diagnostics to verify that the memory modules are operating properly.

Removing a Memory Module

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

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

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

3. Press out on the securing clip at each end of the memory module connector. See Figure 6-3.

4. Grasp the memory module and pull it out of the connector.

   If the module is difficult to remove, gently move the module back and forth to remove it from the connector.

Processor

To take advantage of future options in speed and functionality, you can upgrade the processor.

The processor and its associated cache memory are contained in an LGA package that is installed in a socket on the system board.

Replacing the Processor

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

⚠️ **CAUTION: The processor and heat sink can get very hot during normal operation. Ensure that they have had sufficient time to cool before you touch them.**

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

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

3. Pivot the processor cooling shroud away from the heat sink.

4. Remove the processor heat sink.

    a. Remove the two retention module clips by squeezing the tabs on the clip and lifting the retention module clip up. See Figure 6-4.

    b. On the retention module base, pull the tab away from the heat sink and rotate the heat sink away from the processor as shown in Figure 6-4.

Figure 6-4. Removing the Retention Module Clip
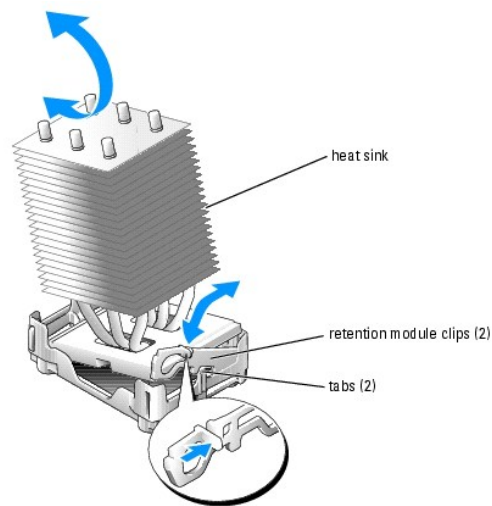
5. Push the processor socket release lever down and away from the release lever latch, and then lift the release lever until the retention latch is released. See Figure 6-5.

Figure 6-5. Removing the Processor
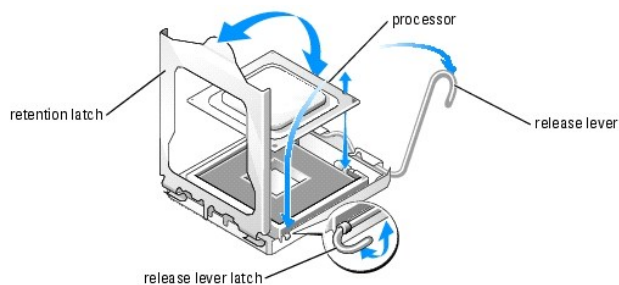
🔘 **NOTICE:** Be careful not to touch or drop any foreign materials on the processor pins when you remove the processor from the socket.

6. Pivot the retention latch away from the processor, and then remove the processor from the socket.

    Leave the release lever and retention latch in the release position so that the socket is ready for the new processor.

7. Align pin 1 (the imprinted corner) of the processor and pin 1 of the socket.

🔘 **NOTICE:** Processor pins are delicate. To avoid damage, ensure that the processor aligns properly with the socket, and do not use force when you install the processor.

NOTICE: Use caution when removing and installing the processor. Bending or damaging the processor socket pins will permanently damage the system board.

8. Remove the processor socket protective cover (if present).

9. Carefully set the processor in the socket and press it down lightly to seat it. See Figure 6-5.

10. Rotate the retention latch onto the processor, and then rotate the release lever back toward the system board until it snaps into place, securing the processor.

11. Clean the thermal grease from the bottom of the heat sink.

12. Apply the new thermal grease to the top of the processor.

13. Place one end of the heat sink under the retention module base tab, and lower the heat sink onto the processor until the heat sink snaps securely in the retention module base. See Figure 6-5.

14. While squeezing the tabs on retention module clip, lower the clip into the retention module base until it snaps into place. See Figure 6-4.

   Repeat this step for the second retention module clip.

15. Pivot the cooling shroud down until it snaps into place.

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

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

System Battery

A coin-cell battery maintains system configuration, date, and time information. The battery can last several years.

If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

The battery may need replacing if you have repeatedly reset the time and date information after turning on the system or if one of the following messages appear:

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

or

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

or

```
Battery voltage is low
```

To determine whether you need to replace the battery, see "Troubleshooting the System Battery" in "Troubleshooting Your System."

You can operate your system without a battery; however, without a battery, the configuration information is erased if the system is turned off or unplugged from the electrical outlet. In this case, you must enter the System Setup program and reset the configuration options.

CAUTION: A new battery can explode 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.

Replacing the Battery

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

1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens. See "Using the System Setup Program" in the *User's Guide.*

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

3. Locate the battery on the system board. See Figure A-3 for the battery location.

NOTICE: If you use a blunt, nonconductive object to depress the tab next to the battery, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the tab before you attempt to depress the tab. Do not pry out the battery. You may damage the system board by prying off the socket or by breaking circuit traces on the system board.

4. Remove the battery by pressing on the tab. See Figure 6-6.

Figure 6-6. Replacing the Battery
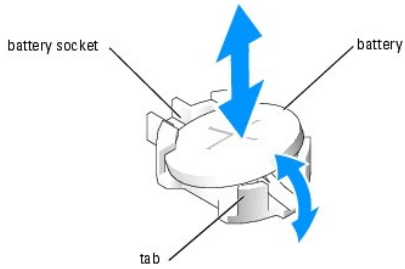
5. Install the new battery with the side labeled "+" facing up, and press down until it snaps into place.

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

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

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

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

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

10. To test the newly installed battery, turn off the system and disconnect it from electrical power for at least an hour.

11. After an hour, reconnect the system to a power source and turn it on.

12. Enter the System Setup program. If the time and date are still incorrect, see "Getting Help."

13. Properly dispose of the old battery. For more information, see your *Product Information Guide*.

Back to Contents Page

Installing Drives

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- General Installation Guidelines
- Front-Panel Inserts
- Hard Drives
- Installing a SCSI Controller Card
- Diskette Drive (Optional)
- 5.25-Inch Optical and Tape Drives

The drive bays in your system provide space for up to two SATA or SCSI hard drives, two 5.25-inch drives, and an optional diskette drive. See Figure 7-1.

Figure 7-1. Drive Locations Inside the System
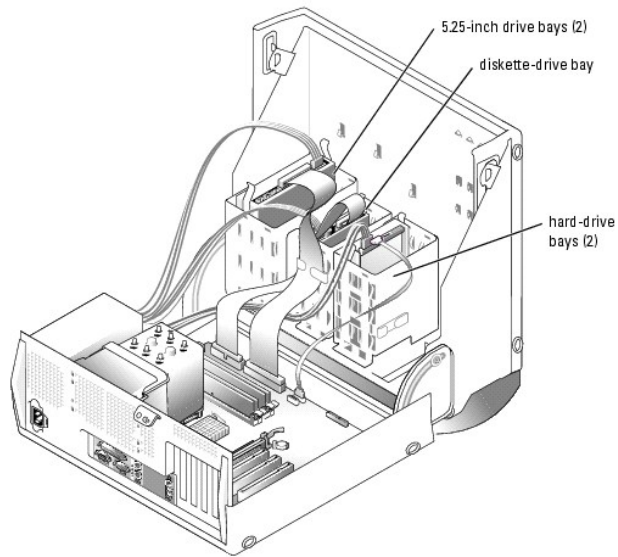
General Installation Guidelines

SCSI Installation Guidelines

Although SCSI drives are installed in essentially the same way as other drives, their configuration requirements are different. To install and configure a SCSI drive, follow the guidelines in the following subsections.

NOTE: The SCSI controller card must be installed in PCI slot 2 or slot 3.

NOTE: SCSI devices installed by Dell are configured correctly during the manufacturing process. You do not need to set the SCSI ID for these drives.

SCSI Interface Cables

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

SCSI ID Numbers

Each drive attached to a SCSI controller must have a unique SCSI ID number from 0 to 15.

- The SCSI hard drive from which the system boots is configured as SCSI ID 0.

- If you install an additional SCSI drive or change your SCSI configuration, see the documentation for each SCSI drive for information on setting the appropriate SCSI ID number.

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

SCSI Device Termination

SCSI logic requires that termination be enabled for the two drives at opposite ends of the SCSI chain and disabled for all drives in between. For internal SCSI drives, termination is configured automatically. See the documentation provided with any optional SCSI drive you purchase for information on disabling termination.

Configuring the Boot Drive

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

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

    After you open and close the cover, the chassis intrusion detector, if enabled, causes the following message to appear on the screen at the next computer start-up:

    ALERT! Cover was previously removed.

  l Reset the chassis intrusion detector by changing **Chassis Intrusion** to **Enabled** or **Enabled-Silent**.

Front-Panel Inserts

If you are installing a new 5.25-inch drive, remove the front-panel inserts to allow external access to the drive. To gain access to the front-panel insert, you might need to remove a device.

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

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

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

3. If applicable, remove a device. See the appropriate removal procedure.

4. Squeeze the insert tabs until the insert pops free of the front-panel cover. See Figure 7-2.

Figure 7-2. Removing Front-Panel Inserts
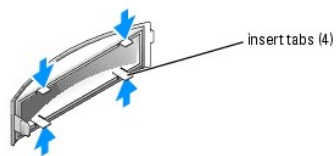
Hard Drives

Your system contains up to two SATA or SCSI non-hot-plug hard drives. The integrated SATA controller supports two SATA hard drives. If your system contains SCSI hard drives, they must be connected to an optional SCSI controller card.

The steps for removing and installing SATA and SCSI hard drives are the same.

Removing a Hard Drive

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

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

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

3. Disconnect the power and interface cables from the hard drive. See Figure 7-3 and Figure 7-4.

Figure 7-3. Removing or Installing a SCSI Hard Drive
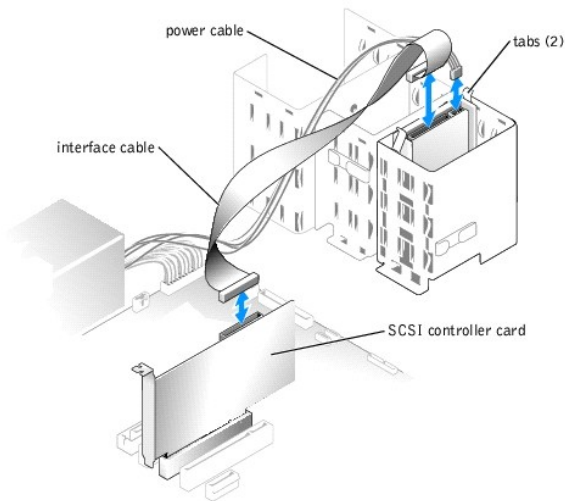
Figure 7-4. Removing or Installing a SATA Hard Drive
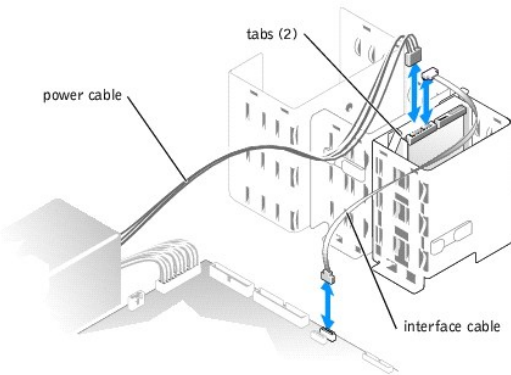
4. Press in on the tabs on each side of the drive and slide the drive up and out of the drive bay.

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

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

Installing a Hard Drive

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

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

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

3. Unpack the hard drive, and prepare it for installation.

4. Check the documentation for the drive to verify that it is configured for your system.

5. If the hard drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See Figure 7-5.

Figure 7-5. Installing Drive Rails

drive rails (2)

screws (4)

6. Slide the new drive into the drive bay until the tabs on the rails click securely into position.

7. Connect the power cable to the drive. See Figure 7-3 and Figure 7-4.

8. Connect the interface cable to the drive:

   l   Connect SATA hard drives to the SATA0 and SATA1 connectors on the system board.

   l   Connect SCSI hard drives to the SCSI controller card. See the documentation for the controller card.

   See Figure A-3 for the location of the drive interface connectors on the system board.

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

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

   If the hard drive is included in a RAID configuration, go to the next step.

   If the hard is not included in a RAID configuration, go to step 12.

11. Enter the System Setup program and ensure that:

   c.   The drive controller is enabled.

   d.   **RAID On** is enabled in the **Drive Controller** menu.

   If your system is running Red Hat Linux, ensure that **RAID On** is enabled in the **Drive Controller** menu.

   e.   Go to step 13.

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

13. Partition and logically format your drive before you go to the next step.

   See the documentation for your operating system for instructions.

14. Test the hard drive by running the system diagnostics. See "Running System Diagnostics."

15. If the drive you just installed is the primary drive, install your operating system on the hard drive.

Installing a SCSI Controller Card

See "Installing an Expansion Card" in "Installing System Components" for instructions about installing the card and routing the cables.

Diskette Drive (Optional)

The system supports an optional standard diskette drive.

Removing the Diskette Drive

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

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

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

3. Disconnect the power and interface cables from the diskette drive. See Figure 7-6.
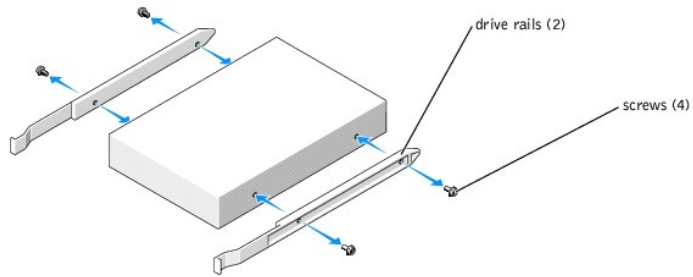
4. Press in on the tabs on each side of the drive and slide the drive up and out of the drive bay.

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

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

Installing an Optional Diskette Drive

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

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

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

3. Unpack the replacement diskette drive, and prepare it for installation.

4. Check the documentation for the drive to verify that it is configured for your system.

5. If your new diskette drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See Figure 7-5.

6. Remove the front panel insert.

7. Slide the drive into the diskette-drive bay until the tabs on the rails click securely into position.

8. Connect the power cable to the drive. See Figure 7-6.

Figure 7-6. Removing or Installing an Optional Diskette Drive
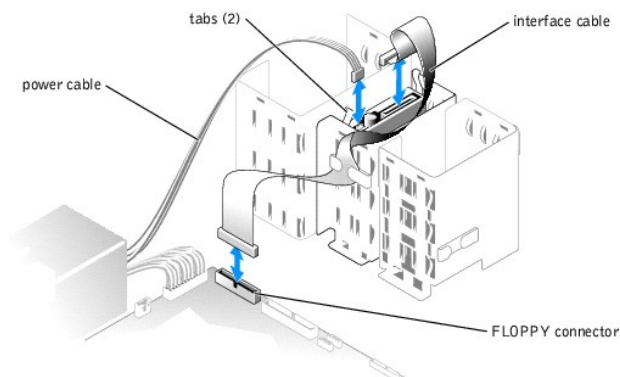
9. Connect the interface cable from the drive to the FLOPPY connector on the system board. See Figure 7-6.

   See Figure A-3 for the location of the FLOPPY connector on the system board.

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

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

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

13. Test the drive by running the system diagnostics. See "Running System Diagnostics."

5.25-Inch Optical and Tape Drives

You can install an additional 5.25-inch drive of your choice in the second 5.25-inch drive bay. See Figure 7-1. If you are installing a tape backup unit (TBU), it must be installed in the second bay.

Installing a 5.25-Inch Drive

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

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

   For instructions, see the documentation that accompanied the drive. Also, see "SCSI Installation Guidelines" for information on configuring the drive.

2. If the drive does not have the drive rails attached, attach the drive rails to the new drive by aligning the screw holes on the drive with the screw holes on the drive rails and then inserting and tightening all four screws (two screws on each rail). See Figure 7-5.

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

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

5. Remove the front-panel insert for the empty drive bay. See "Front-Panel Inserts."

6. Slide the drive into the drive bay until the tabs on the rails click securely into position.

7. Connect the power cable to the drive. See Figure 7-7.

Figure 7-7. Installing a 5.25-Inch Drive
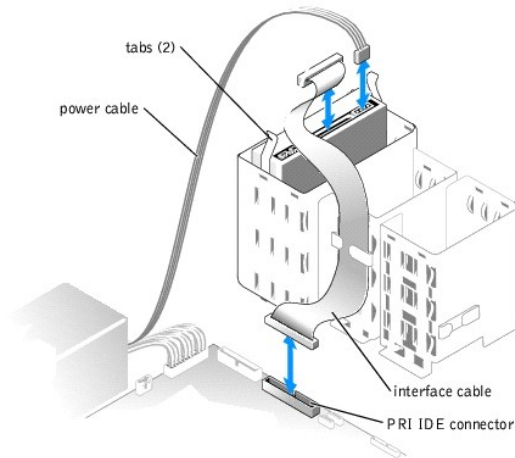
8. Connect the interface cable from the drive to the PRI IDE connector on the system board to the drive. See Figure 7-7 and Figure A-3.

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

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

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

12. Test the drive by running the system diagnostics. See "Running System Diagnostics."

Getting Help

Dell™ PowerEdge™ SC420 Systems Installation and Troubleshooting Guide

- Technical Assistance
- Dell Enterprise Training and Certification
- Problems With Your Order
- Product Information
- Returning Items for Warranty Repair or Credit
- Before You Call
- Contacting Dell

Technical Assistance

If you need assistance with a technical problem, perform the following steps:

1. Complete the procedures in "Troubleshooting Your System."

2. Run the system diagnostics and record any information provided.

3. Make a copy of the Diagnostics Checklist, and fill it out.

4. Use Dell's extensive suite of online services available at Dell Support at **support.dell.com** for help with installation and troubleshooting procedures.

   For more information, see "Online Services."

5. If the preceding steps have not resolved the problem, call Dell for technical assistance.

NOTE: Call technical support from a phone near or at the system so that technical support can assist you with any necessary procedures.

NOTE: Dell's Express Service Code system may not be available in all countries.

When prompted by Dell's automated telephone system, enter your Express Service Code to route the call directly to the proper support personnel. If you do not have an Express Service Code, open the **Dell Accessories** folder, double-click the **Express Service Code** icon, and follow the directions.

For instructions on using the technical support service, see "Technical Support Service" and "Before You Call."

NOTE: Some of the following services are not always available in all locations outside the continental U.S. Call your local Dell representative for information on availability.

Online Services

You can access Dell Support at **support.dell.com**. Select your region on the **WELCOME TO DELL SUPPORT** page, and fill in the requested details to access help tools and information.

You can contact Dell electronically using the following addresses:

- World Wide Web

  www.dell.com/

  www.dell.com/ap/ (Asian/Pacific countries only)

  www.dell.com/jp (Japan only)

  www.euro.dell.com (Europe only)

  www.dell.com/la (Latin American countries)

  www.dell.ca (Canada only)

- Anonymous file transfer protocol (FTP)

  ftp.dell.com/

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

- Electronic Support Service

  support@us.dell.com

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

support.jp.dell.com (Japan only)

support.euro.dell.com (Europe only)

l   Electronic Quote Service

sales@dell.com

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

sales_canada@dell.com (Canada only)

l   Electronic Information Service

info@dell.com

AutoTech Service

Dell's automated technical support service—AutoTech—provides recorded answers to the questions most frequently asked by Dell customers about their portable and desktop computer systems.

When you call AutoTech, use your touch-tone telephone to select the subjects that correspond to your questions.

The AutoTech service is available 24 hours a day, 7 days a week. You can also access this service through the technical support service. See the contact information for your region.

Automated Order-Status Service

To check on the status of any Dell™ products that you have ordered, you can go to **support.dell.com**, or you can call the automated order-status service. A recording prompts you for the information needed to locate and report on your order. See the contact information for your region.

Technical Support Service

Dell's technical support service is available 24 hours a day, 7 days a week, to answer your questions about Dell hardware. Our technical support staff use computer-based diagnostics to provide fast, accurate answers.

To contact Dell's technical support service, see "Before You Call" and then see the contact information for your region.

Dell Enterprise Training and Certification

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

Problems With Your Order

If you have a problem with your order, such as missing parts, wrong parts, or incorrect billing, contact Dell for customer assistance. Have your invoice or packing slip available when you call. See the contact information for your region.

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit the Dell website at **www.dell.com**. For the telephone number to call to speak to a sales specialist, see the contact information for your region.

Returning Items for Warranty Repair or Credit

Prepare all items being returned, whether for repair or credit, as follows:

1. Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.

   For the telephone number to call, see the contact information for your region.

2. Include a copy of the invoice and a letter describing the reason for the return.

3. Include a copy of any diagnostic information (including the Diagnostics Checklist) indicating the tests you have run and any error messages reported by

the system diagnostics.

4. Include any accessories that belong with the item(s) being returned (such as power cables, media such as CDs and diskettes, and guides) if the return is for credit.

5. Pack the equipment to be returned in the original (or equivalent) packing materials.

   You are responsible for paying shipping expenses. You are also responsible for insuring any product returned, and you assume the risk of loss during shipment to Dell. Collect-on-delivery (C.O.D.) packages are not accepted.

Returns that are missing any of the preceding requirements will be refused at our receiving dock and returned to you.

Before You Call

NOTE: Have your Express Service Code ready when you call. The code helps Dell's automated-support telephone system direct your call more efficiently.

Remember to fill out the Diagnostics Checklist. If possible, turn on your system before you call Dell for technical assistance and call from a telephone at or near the computer. You may be asked to type some commands at the keyboard, relay detailed information during operations, or try other troubleshooting steps possible only at the computer system itself. Ensure that the system documentation is available.

⚠️ **CAUTION: Before servicing any components inside your computer, see your *Product Information Guide* for important safety information.**

Contacting Dell

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

l **www.dell.com**

l **support.dell.com** (technical support)

l **premiersupport.dell.com** (technical support for educational, government, healthcare, and medium/large business customers, including Premier, Platinum, and Gold customers)

For specific Web addresses for your country, find the appropriate country section in the table below.

NOTE: Toll-free numbers are for use within the country for which they are listed.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Anguilla	General Support	toll-**free:** 800-335-0031
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires) International Access Code: **00** Country Code: **54** City Code: **11**	Website: **www.dell.com.ar**	
	E-mail: us_latin_services@dell.com	
	E-mail for desktop and portable computers: la-techsupport@dell.com	
	E-mail for servers and EMC: la_enterprise@dell.com	
	Customer Care	toll-**free:** 0-800-444-0730
	Tech Support	toll-**free:** 0-800-444-0733
	Tech Support Services	toll-**free:** 0-800-444-0724
	Sales	0-810-444-3355
Aruba	General Support	toll-**free:** 800-1578
Australia (Sydney) International Access Code: **0011** Country Code: **61** City Code: **2**	E-mail (Australia): au_tech_support@dell.com	
	E-mail (New Zealand): nz_tech_support@dell.com	
	Home and Small Business	1-300-65-55-33
	Government and Business	toll-**free:** 1-800-633-559
	Preferred Accounts Division (PAD)	toll-**free:** 1-800-060-889
	For servers and storage	toll-**free:** 1-800-505-095
	For desktop and portable computers	toll-**free:** 1-800-733-314
	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
Austria (Vienna)	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
International Access Code: **900**	Home/Small Business Sales	0820 240 530 00
	Home/Small Business Fax	0820 240 530 49
Country Code: **43**	Home/Small Business Customer Care	0820 240 530 14
	Preferred Accounts/Corporate Customer Care	0820 240 530 16
City Code: **1**	Home/Small Business Technical Support	0820 240 530 14
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	0820 240 530 00
Bahamas	General Support	toll-free: 1-866-278-6818
Barbados	General Support	1-800-534-3066
Belgium (Brussels)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail for French Speaking Customers: **support.euro.dell.com/be/fr/emaildell/**	
Country Code: **32**	Technical Support	02 481 92 88
	Technical Support Fax	02 481 92 95
City Code: **2**	Customer Care	02 713 15 .65
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	General Support	1-800-342-0671
Bolivia	General Support	toll-free: 800-10-0238
Brazil	Website: **www.dell.com/br**	
International Access Code: **00**	Customer Support, Technical Support	0800 90 3355
	Technical Support Fax	51 481 5470
Country Code: **55**	Customer Care Fax	51 481 5480
City Code: **51**	Sales	0800 90 3390
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei	Customer Technical Support (Penang, Malaysia)	604 633 4966
	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: **673**	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario)	Online Order Status: **www.dell.ca/ostatus**	
	AutoTech (automated technical support)	toll-free: 1-800-247-9362
International Access Code: **011**	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago)	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
Country Code: **56**		
City Code: **2**		
China (Xiamen)	Technical Support website: **support.dell.com.cn**	
	Technical Support E-mail: cn_support@dell.com	
Country Code: **86**	Technical Support Fax	818 1350
City Code: **592**	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 Advocacy	toll-free: 800 858 2060
	Customer Advocacy Fax	592 818 1308
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055

	Large Corporate Accounts Key Accounts	toll-**free: 800 858 2628**
	Large Corporate Accounts North	toll-**free: 800 858 2999**
	Large Corporate Accounts North Government and Education	toll-**free: 800 858 2955**
	Large Corporate Accounts East	toll-**free: 800 858 2020**
	Large Corporate Accounts East Government and Education	toll-**free: 800 858 2669**
	Large Corporate Accounts Queue Team	toll-**free: 800 858 2572**
	Large Corporate Accounts South	toll-**free: 800 858 2355**
	Large Corporate Accounts West	toll-**free: 800 858 2811**
	Large Corporate Accounts Spare Parts	toll-**free: 800 858 2621**
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: **00** Country Code: **420** City Code: **2**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	02 2186 27 27
	Technical Support Fax	02 2186 27 28
	Customer Care	02 2186 27 11
	Customer Care Fax	02 2186 27 14
	Switchboard	02 2186 27 11
Denmark (Copenhagen) International Access Code: 00 Country Code: **45**	Website: **support.euro.dell.com**	
	E-mail Support (portable computers): den_nbk_support@dell.com	
	E-mail Support (desktop computers): den_support@dell.com	
	E-mail Support (servers): Nordic_server_support@dell.com	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Switchboard Fax (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Switchboard Fax (Home/Small Business)	3287 5001
Dominica	General Support	toll-**free: 1-866-278-6821**
Dominican Republic	General Support	1-800-148-0530
Ecuador	General Support	toll-**free: 999-119**
El Salvador	General Support	01-899-753-0777
Finland (Helsinki) International Access Code: **990** Country Code: **358** City Code: **9**	Website: **support.euro.dell.com**	
	E-mail: fin_support@dell.com	
	E-mail Support (servers): Nordic_support@dell.com	
	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
France (Paris) (Montpellier) International Access Code: 00 Country Code: **33** City Codes: **(1) (4)**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/fr/fr/emaildell/**	
	Home and Small Business	
	Technical Support	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen)	Website: **support.euro.dell.com**	

	E-mail: tech_support_central_europe@dell.com	
International Access Code: **00**	Technical Support	06103 766-7200
Country Code: **49**	Home/Small Business Customer Care	0180-5-224400
City Code: **6103**	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
Greece	Website: **support.euro.dell.com**	
International Access Code: 00	E-mail: **support.euro.dell.com/gr/en/emaildell/**	
	Technical Support	00800-44 14 95 18
Country Code: 30	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	General Support	toll-**free:** 1-866-540-3355
Guatemala	General Support	1-800-999-0136
Guyana	General Support	toll-**free:** 1-877-270-4609
Hong Kong	Website: **support.ap.dell.com**	
International Access Code: **001**	E-mail: apsupport@dell.com	
	Technical Support (Dimension™ and Inspiron™)	2969 3188
Country Code: **852**	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	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 3155
India	Technical Support	1600 33 8045
	Sales	1600 33 8044
Ireland (Cherrywood)	Website: **support.euro.dell.com**	
International Access Code: **16**	E-mail: dell_direct_support@dell.com	
	Technical Support	1850 543 543
Country Code: **353**	U.K. Technical Support (dial within U.K. only)	0870 908 0800
City Code: **1**	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	1850 200 982
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	Fax/Sales Fax	01 204 0103
	Switchboard	01 204 4444
Italy (Milan)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/it/it/emaildell/**	
	Home and Small Business	
Country Code: **39**	Technical Support	02 577 826 90
City Code: **02**	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	General Support (dial from within Jamaica only)	1-800-682-3639

Japan (Kawasaki)	Website: **support.jp.dell.com**	
	Technical Support (servers)	toll-free: 0120-198-498
International Access Code: **001**	Technical Support outside of Japan (servers)	81-44-556-4162
	Technical Support (Dimension™ and Inspiron™)	toll-free: 0120-198-226
Country Code: **81**	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
City Code: **44**	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)	toll-free:0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (PDAs, projectors, printers, routers)	toll-free: 0120-981-690
	Technical Support outside of Japan (PDAs, projectors, printers, routers)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Switchboard	044-556-4300
Korea (Seoul)	Technical Support	toll-free: 080-200-3800
	Sales	toll-free: 080-200-3600
International Access Code: **001**	Customer Service (Seoul, Korea)	toll-free: 080-200-3800
	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: **82**	Fax	2194-6202
City Code: **2**	Switchboard	2194-6000
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600
		or 512 728-3772
Luxembourg	Website: **support.euro.dell.com**	
	E-mail: tech_be@dell.com	
International Access Code: **00**	Technical Support (Brussels, Belgium)	3420808075
Country Code: **352**	Home/Small Business Sales (Brussels, Belgium)	toll-free: 080016884
	Corporate Sales (Brussels, Belgium)	02 481 91 00
	Customer Care (Brussels, Belgium)	02 481 91 19
	Fax (Brussels, Belgium)	02 481 92 99
	Switchboard (Brussels, Belgium)	02 481 91 00
Macao	Technical Support	toll-free: 0800 582
	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: **853**	Transaction Sales	toll-free: 0800 581
Malaysia (Penang)	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free: 1 800 88 0193
	Technical Support (Dimension and Inspiron)	toll-free: 1 800 88 1306
International Access Code: **00**	Technical Support (PowerEdge and PowerVault)	toll-free: 1800 88 1386
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
Mexico	Customer Technical Support	001-877-384-8979
International Access Code: **00**		or 001-877-269-3383
Country Code: **52**	Sales	50-81-8800
		or 01-800-888-3355
	Customer Service	001-877-384-8979
		or 001-877-269-3383
	Main	50-81-8800
		or 01-800-888-3355
Montserrat	General Support	toll-free: 1-866-278-6822

Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support	020 674 45 00
	Technical Support Fax	020 674 47 66
Country Code: **31**	Home/Small Business Customer Care	020 674 42 00
	Relational Customer Care	020 674 4325
City Code: **20**	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand	E-mail (New Zealand): nz_tech_support@dell.com	
	E-mail (Australia): au_tech_support@dell.com	
International Access Code: **00**	Technical Support (for desktop and portable computers)	0800 443 563
Country Code: **64**	Technical Support (for servers and storage)	0800 505 098
	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
Nicaragua	General Support	001-800-220-1006
Norway (Lysaker)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail Support (portable computers): nor_nbk_support@dell.com	
Country Code: **47**	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
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw)	Website: **support.euro.dell.com**	
International Access Code: **011**	E-mail: pl_support_tech@dell.com	
	Customer Service Phone	57 95 700
Country Code: **48**	Customer Care	57 95 999
	Sales	57 95 999
City Code: **22**	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/pt/en/emaildell/**	
	Technical Support	707200149
Country Code: **351**	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	General Support	1-800-805-7545
St. Kitts and Nevis	General Support	toll-**free:** 1-877-441-4731
St. Lucia	General Support	1-800-882-1521
St. Vincent and the Grenadines	General Support	toll-**free:** 1-877-270-4609
Singapore (Singapore)	Technical Support (Dimension and Inspiron)	toll-**free:** 1800 394 7430
International Access Code: **005**	Technical Support (Optiplex, Latitude, and Precision)	toll-**free:** 1800 394 7488
	Technical Support (PowerEdge and PowerVault)	toll-**free:** 1800 394 7478

Country Code: **65**	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-**free: 800 6011 054**
	Corporate Sales	toll-**free: 800 6011 053**
South Africa (Johannesburg)	Website: **support.euro.dell.com**	
International Access Code:	E-mail: dell_za_support@dell.com	
	Gold Queue	011 709 7713
09/091	Technical Support	011 709 7710
Country Code: **27**	Customer Care	011 709 7707
	Sales	011 709 7700
City Code: **11**	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/es/es/emaildell/**	
	Home and Small Business	
Country Code: **34**	Technical Support	902 100 130
City Code: **91**	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Care	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: swe_support@dell.com	
	E-mail Support for Latitude and Inspiron: Swe-nbk_kats@dell.com	
Country Code: **46**	E-mail Support for OptiPlex: Swe_kats@dell.com	
City Code: **8**	E-mail Support for Servers: Nordic_server_support@dell.com	
	Technical Support	08 590 05 199
	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	20 140 14 44
	Technical Support Fax	08 590 05 594
	Sales	08 590 05 185
Switzerland (Geneva)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: Tech_support_central_Europe@dell.com	
	E-mail for French-speaking HSB and Corporate Customers: **support.euro.dell.com/ch/fr/emaildell/**	
Country Code: **41**	Technical Support (Home and Small Business)	0844 811 411
City Code: **22**	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan	Technical Support (portable and desktop computers)	toll-**free: 00801 86 1011**
International Access Code: **002**	Technical Support (servers and storage)	toll-**free: 00801 60 1256**
Country Code: **886**	Corporate Sales	toll-**free: 00801 651 227**
Thailand	Technical Support (Optiplex, Latitude, and Precision)	toll-**free: 1800 0060 07**
International Access Code: **001**	Technical Support (PowerEdge and PowerVault)	toll-**free: 1800 0600 09**
Country Code: **66**	Customer Service (Penang, Malaysia)	604 633 4949
	Sales	toll-**free: 0880 060 09**
Trinidad/Tobago	General Support	1-800-805-8035
Turks and Caicos Islands	General Support	toll-**free: 1-866-540-3355**

U.K. (Bracknell)	Website: **support.euro.dell.com**	
International Access Code: **00**	Customer Care website: **support.euro.dell.com/uk/en/ECare/Form/Home.asp**	
Country Code: **44**		
City Code: **1344**	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
Uruguay	General Support	toll-**free:** 000-413-598-2521
U.S.A. (Austin, Texas)	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
	Consumer (Home and Home Office)	
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: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-**free:** 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-**free:** 1-800-283-2210
	Business	
	Customer Service and Technical Support	toll-**free:** 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-**free:** 1-800-695-8133
	Printers and Projectors Technical Support	toll-**free:** 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-**free:** 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-**free:** 1-800-234-1490
	Dell Sales	toll-**free:** 1-800-289-3355 or toll-**free:** 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-**free:** 1-888-798-7561
	Software and Peripherals Sales	toll-**free:** 1-800-671-3355
	Spare Parts Sales	toll-**free:** 1-800-357-3355
	Extended Service and Warranty Sales	toll-**free:** 1-800-247-4618
	Fax	toll-**free:** 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-**free:** 1-877-DELLTTY (1-877-335-5889)
U.S. Virgin Islands	General Support	1-877-673-3355
Venezuela	General Support	8001-3605

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Notes, Notices, and Cautions

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

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

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

Abbreviations and Acronyms

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