Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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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.

Initial release: Oct 2003

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Jumpers, Switches, and Connectors

Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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

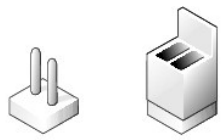
Jumpers—A General Explanation

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

Jumpers

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

Figure A-1. Example Jumper



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

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

System Board Jumpers

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

Figure A-2. System Board Jumpers

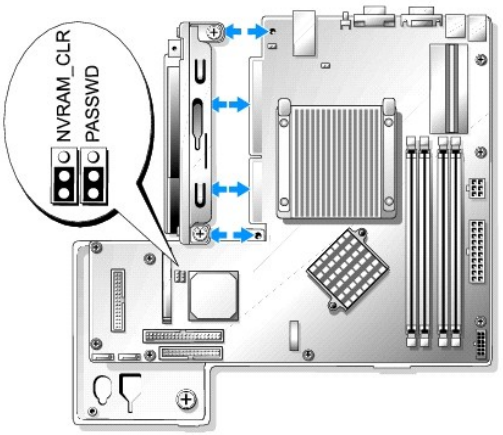


Table A-1. System Board Jumper Settings

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

System Board Connectors

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

Figure A-3. System Board Connectors

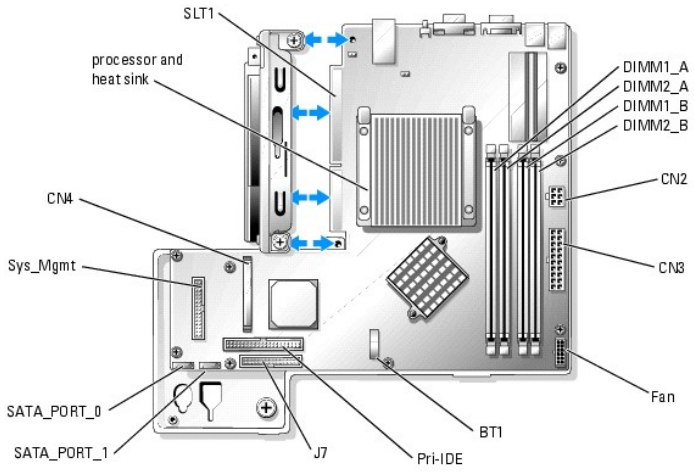


Table A-2. System Board Connectors

Connector	Description

BT1	Connector for the 3.0 V coin battery
CN2	12 V and 3.3 V power connector for the system board
CN3	+5 V and -12 V power connector for the system board
CN4	Daughter card connector (not supported)
DIMM*n*_ *x*	Memory modules (4)
J7	Control panel interface connector
Sys_Mgmt	Connector for the remote access controller (RAC)
Fan	Power connector for the fan assembly
Pri-IDE	CD drive interface connector
SATA_PORT_*n*	Connectors for the SATA hard drives
SLT1	Riser board interface connector

Riser Board Connectors

See Figure A-4 and Table A-3 for the location and description of the backplane board connectors.

Figure A-4. Riser Board Connectors

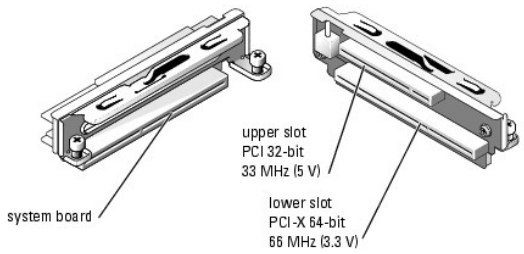


Table A-3. Riser Board Connectors

Connector	Description
Upper slot PCI 32-bit, 33 MHz (5V)	The RAC must be installed in the upper slot.
Lower slot PCI-X 64-bit, 66 MHz (3.3V)	For optimal performance, install RAID and SCSI controllers in the lower slot.
System board	System board interface connector.

Disabling a Forgotten Password

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

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "Opening the System" in "Troubleshooting Your System."
3. Remove the password jumper plug.

   See Figure A-2 to locate the password jumper on the system board.
4. Close the system. See "Closing the System" in "Troubleshooting Your System."
5. Reconnect the system to the electrical outlet, and turn on the system.

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

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

6. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
7. Open the system.
8. Install the password jumper plug.

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

9. Close the system, reconnect the system to the electrical outlet, and turn on the system.
10. Assign a new system and/or setup password.

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

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I/O Connectors

Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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I/O Connectors

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

Figure B-1. I/O Connectors

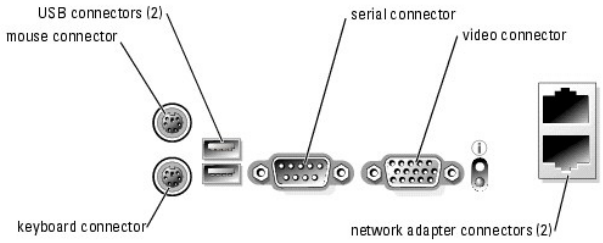

Table B-1 shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
	Serial connector
	Mouse connector
	Keyboard connector
	Video connector
	USB connector
	Network adapter connector

Serial Connector

Serial connectors support devices such as external modems, printers, and mice that require serial data transmission. Serial connectors are also used for console redirection. The serial connector uses a 9-pin D-subminiature connector.

Serial Connector Autoconfiguration

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

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

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

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

Figure B-2. Serial Connector Pin Numbers

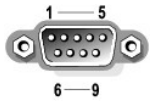

Table B-2. Serial Connector Pin Assignments

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

PS/2-Compatible Keyboard and Mouse Connectors

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

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

Table B-3. Keyboard and Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	KBDATA or MFDATA	I/O	Keyboard data or mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground

4	FVcc	N/A	Fused supply voltage
5	KBCLK or MFCLK	I/O	Keyboard clock or mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Video Connector

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

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

Figure B-4. Video Connector Pin Numbers

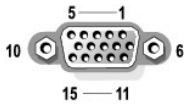

Table B-4. Video Connector Pin Assignments

Pin	Signal	I/O	Definition
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 connectors support 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-5 illustrates the pin numbers for the USB connector and Table B-5 defines the pin assignments for the connector.

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

Figure B-5. USB Connector Pin Numbers

Table B-5. USB Connector Pin Assignments

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

Integrated Network Adapter Connector

The system's integrated network adapters function as separate network expansion cards while providing fast communication between servers and workstations. Figure B-6 illustrates the pin numbers for the network connector and Table B-6 defines the pin assignments for the connector.

Figure B-6. Network Adapter Connector

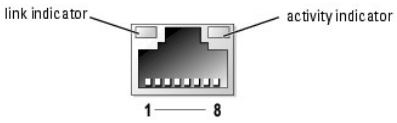

Table B-6. Network Adapter Connector Pin Assignments

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

Network Cable Requirements

The network adapters support a UTP Ethernet cable equipped with a standard RJ-45-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 about the operation of a network, see "Systems Considerations of Multi-Segment Networks" in the IEEE 802.3 standard.

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Abbreviations and Acronyms

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A

ampere(s)

AC

alternating current

ANSI

American National Standards Institute

BIOS

basic input/output system

C

Celsius

CD

compact disc

cm

centimeter(s)

CMOS

complementary metal-oxide semiconductor

CPU

central processing unit

DC

direct current

DHCP

Dynamic Host Configuration Protocol

DIMM

dual in-line memory module

DMA

direct memory access

DMI

desktop management interface

dpi

dots per inch

DRAM

dynamic random-access memory

DRAC III/XT

Dell Remote Access Card III/XT

ECC

error checking and correction

EDO

extended-data out

EMI

electromagnetic interference

EEPROM

electrically erasable programmable read-only memory

ESD

electrostatic discharge

ESDI

enhanced small-device interface

ESM

embedded server management

F

Fahrenheit

FAT

file allocation table

FCC

Federal Communications Commission

ft

feet

g

gram(s)

GB

gigabyte(s)

GUI

graphical user interface

Hz

hertz

I/O

input/output

ID

identification

IDE

integrated drive electronics

IPX

Internet packet exchange

IRQ

interrupt request

KB

kilobyte(s)

KB/sec

kilobyte(s) per second

kg

kilogram(s)

kHz

kilohertz

L2

Level 2

LAN

local area network

lb

pound(s)

LED

light-emitting diode

LVD

low voltage differential

m

meter(s)

mA

milliampere(s)

mAh

milliampere-hour(s)

MB

megabyte(s)

MHz

megahertz

mm

millimeter(s)

ms

millisecond(s)

MS-DOS®

Microsoft® Disk Operating System

mV

millivolt(s)

NAS

network attached storage

NIC

network interface controller

NIS

network information service

NiCad

nickel cadmium

NMI

nonmaskable interrupt

ns

nanosecond(s)

NTFS

NT File System

NVRAM

nonvolatile random-access memory

PCI

Peripheral Component Interconnect

PDU

power distribution unit

PGA

pin grid array

POST

power-on self-test

RAID

redundant array of independent disks

RAM

random-access memory

RAS

remote access services

ROM

read-only memory

rpm

revolutions per minute

RTC

real-time clock

SATA

serial ATA

sec

second(s)

SDRAM

synchronous dynamic random-access memory

SMBus

system management bus

SNMP

Simple Network Management Protocol

SDRAM

synchronous dynamic random-access memory

TCP/IP

Transmission Control Protocol/Internet Protocol

UART

universal asynchronous receiver-transmitter

UPS

uninterruptible power supply

UTP

unshielded twisted pair

V

volt(s)

VAC

volt(s) alternating current

VDC

volt(s) direct current

VGA

video graphics array

VRAM

video random-access memory

W

watt(s)

WH

watt-hour(s)

ZIF

zero insertion force

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Introduction

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Your system includes the following significant service and upgrade features:

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

The following system upgrade options are available:

- Processor
- Memory
- PCI expansion card

Other Documents You May Need

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

- The *Rack Installation Guide* or *Rack Installation Instructions* included with your rack solution describes how to install your system into a rack.
- The *Getting Started Guide* provides an overview of initially setting up your system.
- The *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.

Obtaining Technical Assistance

If you do not understand a procedure in this guide or if the system does not perform as expected, see "Getting Help."

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

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Indicators, Messages, and Codes

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

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

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

Front-Panel Indicators and Features

Figure 2-1 shows the front-panel indicators for the system status and hard drive activity. The power button has a status indicator built into the button. Also, the optional CD and diskette drives have activity indicators. Table 2-1 details the conditions associated with each front-panel indicator code.

Figure 2-1. Front-Panel Features

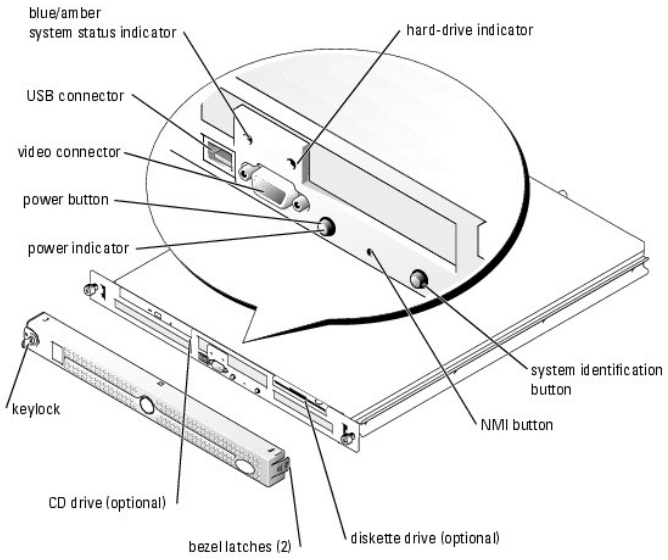

Table 2-1. Front-Panel Indicator Codes

Indicator Type	Activity Indicator	Indicator Code
Power	Off	The system is off and AC power is not connected to the system.
	Green blinking	AC power is connected to the system, but the system is not powered on.
	Green	Indicates that the system is powered on.
Blue/amber system status	Off	The system is off.
	Blue	The system is operating normally.
	Blue blinking	The system is identifying itself due to the pressing of the identification button. **NOTE:** Systems management software causes the indicator to blink to identify the system.
	Amber blinking	Indicates a fault with the system.
Hard drive	Green blinking	Indicates hard drive activity.

- The power button provides the ability to soft switch the power cycling to the system.
- The two system identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed or the system management software is used to identify the system, the blue system status indicators on the front and back of the system blink. (To stop the indicator from blinking press one of the identification buttons a second time, or use the systems management software.)

The front panel also incorporates a USB connector and a video connector. See Figure 2-1.

Back-Panel Indicators and Features

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

Figure 2-2. Back-Panel Features

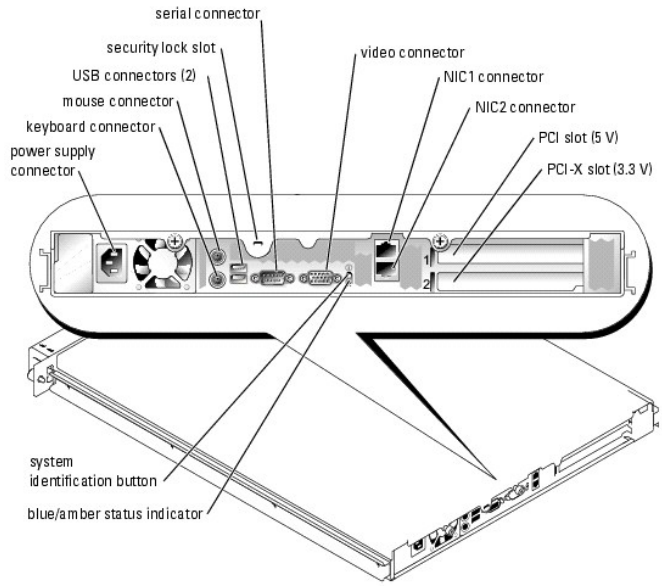

Figure 2-3. Network Adapter Indicators

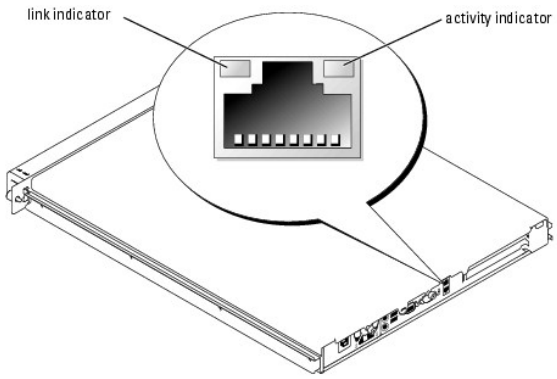

Table 2-2. Back-Panel LED Codes

LED Indicator	Normal Operation	Error Condition
Status	Off	The system is off.
	Blue	The system is operating normally.
	Blue blinking	The system is identifying itself due to the pressing of the identification button. **NOTE:** Systems management software causes the indicator to blink to identify the system.
	Amber blinking	Indicates a fault with the system.
NIC activity	Flashing amber indicates network data is being sent or received.	When this indicator is off at the same time that the link indicator is off, the network adapter is not connected to the network.
NIC link	Steady green indicates that the network adapter is connected to a valid link partner on the network.	When this indicator is off at the same time that the activity indicator is off, the network adapter is not connected to the network.

System Messages

System messages appear on the screen to notify you of a possible problem with the system. Table 2-3 lists the system messages that can occur and the probable cause and corrective action for each message.

NOTE: If you receive a system message that is not listed in Table 2-3, check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-3. System Messages

Message	Causes	Corrective Actions
Address mark not found	Faulty diskette, CD, or hard-drive subsystem; defective system board.	Ensure that the diskette, CD, and hard drive cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive(s) installed. If the problem persists, the system board may be defective. See "Troubleshooting the System Board."
Alert! Cover was previously removed!	The chassis has been opened.	Information only.
Alert! CPU fan was not detected. Alert! Memory fan was not detected. Alert! PCI fan was not detected.	Specified fan is faulty or the fan assembly is not installed correctly.	Ensure that the fan assembly is properly installed. See "Troubleshooting a Fan," in "Troubleshooting Your System."
	Unsupported or faulty	Ensure that the memory modules are properly populated. See "Memory Module Installation

Alert! DIMM(s) *n* are unsupported.	memory module(s).	Guidelines" in "Installing System Components." If the problem persist, see "Troubleshooting System Memory," in "Troubleshooting Your System."
Alert! Invalid configuration! When using a single hard disk drive, SATA Port 0 must be used.	The SATA hard drive is not connected to the correct connector on the system board.	Ensure that the drive's interface cable is connected to the SATA_PORT_0 connector on the system board. See Figure A-3 for connector locations.
Alert! Mismatched DIMMs are detected in Bank *n*. Potential for decreased performance!	The memory module installation guidelines have not been properly followed.	Ensure that the memory modules are properly populated. See "Memory Module Installation Guidelines" in "Installing System Components."
Alert! Previous CPU fan failure. Alert! Previous Memory fan failure. Alert! Previous PCI fan failure.	Specified fan failed before last system startup.	Information only.
Alert! Previous voltage failure.	The power supply failed before last system startup.	Information only.
Alert! Processor thermal probe failure detected.	The processor fan is faulty, or the fan assembly is improperly installed.	Ensure that the fan assembly is properly installed. See "Troubleshooting a Fan" in "Troubleshooting Your System."
Alert! Previous processor thermal event was detected.	The processor fan failed before the last system startup.	Information only.
Amount of available memory limited to 256MB!	**OS Install Mode** is enabled in the System Setup program.	Disable **OS Install Mode** in the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
Auxiliary device failure	Loose or improperly connected mouse or keyboard cable; faulty mouse or keyboard.	Replace the mouse. If the problem persists, replace the keyboard.
BIOS Update Attempt Failed!	Remote BIOS update attempt failed.	Retry the BIOS update. If the problem persists, see "Getting Help."
Caution! NVRAM_CLR jumper is installed on system board. Please run SETUP	Incorrect configuration settings in System Setup program; NVRAM_CLR jumper is installed; faulty system battery.	Check the System Setup configuration settings. See "Using the System Setup Program" in your *User's Guide*. Remove the NVRAM_CLR jumper. See Figure A-2 for jumper location.
Data error	Faulty diskette, diskette drive, CD drive, or hard drive.	Replace the diskette. Ensure that the diskette, CD, and hard drive cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.
Decreasing available memory	Faulty or improperly installed memory modules.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory," in "Troubleshooting Your System."
Diskette drive 0 seek failure	Incorrect configuration settings in System Setup program.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
	Faulty or improperly installed diskette, loose diskette or CD interface cable, or loose power cable.	Replace the diskette. Ensure that the diskette and CD cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," in "Troubleshooting Your System."
Diskette read failure	Faulty or improperly inserted diskette.	Replace the diskette.
Diskette subsystem reset failed	Faulty diskette or CD-drive controller.	Ensure that the diskette and CD cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."

Diskette write protected	Diskette write-protect feature enabled.	Move the write-protect tab on the diskette to disable the write-protect feature.
Drive not ready	Diskette missing or improperly inserted in diskette drive.	Reinsert or replace the diskette.
Embedded server management error	Faulty or improperly installed remote access controller (RAC) or loose cable connection.	Ensure that the RAC's cable is properly connected. Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Embedded server management is not present	Faulty or improperly installed RAC or loose cable connection.	Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Error: More than one RAC detected, system halted.	Two RACs are installed, or faulty or improperly installed RAC.	Ensure that only one RAC is installed and that it is installed in the upper slot. Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Error: Remote Access Card initialization failure.	Faulty or improperly installed RAC.	Ensure that the RAC is properly installed. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Error: RAC is not in the correct PCI slot, system halted.	The RAC is not installed in the proper PCI slot.	Ensure that the RAC is installed in the upper slot. See "Troubleshooting Expansion Cards" in "Troubleshooting Your System."
Error: RAC cannot be used with an add-in video card in this slot.	Add-in video card is installed.	Remove the add-in video card. See "Removing an Expansion Card" in "Installing System Components." To use the add-in video card, remove the RAC.
Gate A20 failure	Faulty keyboard controller (faulty system board).	See "Getting Help."
General failure	Operating system corrupted or improperly installed.	Reinstall the operating system.
Hard disk controller failure	Incorrect configuration settings in System Setup program.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
	Faulty or improperly installed hard drive, or loose power cable.	Ensure that the hard-drive subsystem is properly installed. See "Troubleshooting a SATA Hard Drive" or "Troubleshooting a SCSI Hard Drive" in "Troubleshooting Your System" for the type of hard drive installed in your system.
IDE CD-ROM drive not found	Incorrect configuration settings in System Setup program,	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
	Faulty or improperly installed CD drive, loose or faulty cable.	Ensure that the CD-drive subsystem is properly installed. See "Troubleshooting the CD Drive."
Invalid memory configuration detected. Potential corruption exists!	Memory module installation guidelines have not been properly followed.	Ensure that the memory modules are properly populated. See "Memory Module Installation Guidelines" in "Installing System Components."
Keyboard controller failure	Faulty keyboard controller (faulty system board).	See "Getting Help."
Keyboard data line failure Keyboard failure Keyboard stuck key failure	Loose or improperly connected keyboard cable; faulty keyboard; faulty keyboard controller.	Ensure that the keyboard is properly connected. If the problem persists, replace the keyboard. If the problem persists, see "Troubleshooting the System Board" in "Troubleshooting Your System."
Memory address line failure at *address*, read *value* expecting *value*	Faulty or improperly installed memory modules, or faulty system board.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."

Memory double word logic failure at *address*, read *value* expecting *value* Memory odd/even logic failure at *start address* to *end address* Memory write/read failure at *address*, read *value* expecting *value*		
Memory allocation error	Faulty application program.	Restart the application program.
Memory bank population error!	Memory modules are not installed in identical pairs; faulty memory module(s).	Ensure that the memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, see "Troubleshooting System Memory" in "Troubleshooting Your System."
Memory parity interrupt at *address*	Faulty or improperly installed memory modules.	Ensure that all memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, see "Troubleshooting System Memory" in "Troubleshooting Your System."
Memory tests terminated by keystroke	The spacebar was pressed during POST to terminate the memory test.	Information only.
No boot device available	Faulty or missing diskette or CD drive subsystem, hard drive, or hard-drive subsystem.	Check the **Integrated Devices** configuration settings in the System Setup program. See "Using the System Setup Program" in your *User's Guide*. Ensure that either **SCSI Controller**, **Diskette Controller**, or **Integrated Drive Controller** is enabled. If the system is booting from a SCSI controller, ensure that the controller is properly connected. If the problem persists, replace the diskette/CD drive subsystem. See "Removing the Optional Diskette Drive" in "Installing Drives." If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."
No boot sector on hard-disk drive	An operating system is not on the hard drive.	Check the hard drive configuration settings in the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
No timer tick interrupt	Faulty system board.	See "Getting Help."
Non-system disk or disk error	Faulty diskette, diskette/CD-drive assembly, hard drive, or hard-drive subsystem; no operating system on diskette or hard drive.	Use a bootable diskette. If the problem persists, see "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.
Not a boot diskette	Not a bootable diskette.	Use a bootable diskette.
PCI BIOS failed to install	Loose cables to expansion card(s); faulty or improperly installed expansion card.	Ensure that all appropriate cables are securely connected to the expansion cards. See "Troubleshooting Expansion Cards," in "Troubleshooting Your System."
Plug & Play Configuration Error	Error encountered in initializing PCI device; faulty system board.	Install the NVRAM_CLR jumper and reboot the system. See Figure A-2 for jumper location. Check for a BIOS update. If the problem persists, see "Troubleshooting Expansion Cards," in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."
Primary drive *n* configuration error Primary drive *n* failure	Faulty or improperly installed hard drive.	Ensure that the CD drive cables are properly connected. See "Troubleshooting the CD Drive."
Read fault Requested sector not found	Faulty diskette, diskette drive, CD drive, or hard drive.	Replace the diskette. Ensure that the diskette, CD, and hard drive cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.
Reset failed	Improperly connected drive interface or power cable.	Ensure that the interface and power cables are securely connected. See "Troubleshooting the Diskette Drive" and "Troubleshooting the CD Drive," in "Troubleshooting Your System."

ROM bad checksum = *address*	Faulty or improperly installed expansion card.	Remove and reseat the expansion cards. See "Troubleshooting Expansion Cards," in "Troubleshooting Your System."
SATA port *n* hard disk drive auto-sensing error SATA port *n* hard disk drive configuration error SATA port *n* hard disk drive failure	Faulty or improperly installed hard drive.	Ensure that the hard drive cables are properly connected. See "Troubleshooting a SATA Hard Drive."
SATA port *n* hard drive not found	Incorrect configuration settings in the System Setup program. The drive is set as **Auto** without a disk installed.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
Sector not found Seek error Seek operation failed	Faulty diskette or hard drive.	Replace the diskette. If the problem persists, see "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive installed in your system.
Shutdown failure	Shutdown test failure.	Ensure that all memory modules are properly installed. See "Troubleshooting System Memory," in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."
Time-of-day clock stopped	Faulty battery; faulty system board.	See "Troubleshooting the System Battery" in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."
Time-of-day not set - please run SETUP program	Incorrect **Time** or **Date** settings; faulty system battery.	Check the **Time** and **Date** settings See "Using the System Setup Program" in your *User's Guide*. If the problem persists, see "Troubleshooting the System Battery" in "Troubleshooting Your System."
Timer chip counter 2 failed	Faulty system board.	See "Getting Help."
Unexpected interrupt in protected mode	Faulty or improperly installed memory modules or faulty system board.	Ensure that all memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, see "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board."
Unsupported CPU stepping detected	Processor is not supported by the system.	Check for a BIOS update. If the problem persists, install a supported processor. See "Processor."
Utility partition not available	<F10> key was pressed during POST, but no utility partition exists on the boot hard drive.	Create a utility partition on the boot hard drive. See "Using the Dell OpenManage Server Assistant CD" in your *User's Guide*.
Warning! Firmware is out-of-date	Firmware is out-of-date.	Update the firmware. See "Getting Help."
Warning! No microcode update loaded for processor	New or unsupported processor.	Update the BIOS firmware. See "Getting Help."
Write fault Write fault on selected drive	Faulty diskette, diskette drive, CD drive, hard drive.	Replace the diskette. Ensure that the diskette, CD, and hard drive cables are properly connected. See "Troubleshooting the Diskette Drive," "Troubleshooting the CD Drive," "Troubleshooting a SATA Hard Drive," or "Troubleshooting a SCSI Hard Drive," in "Troubleshooting Your System" for the appropriate drive(s) installed in your system.

System Beep Codes

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

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

If a beep code is emitted, write down the series of beeps and then look it up in Table 2-4. 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 2-4. 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 "Troubleshooting the System Board" in "Troubleshooting Your System."
1-1-4	BIOS error	Reflash the BIOS.
1-2-1	Programmable interval-timer failure; faulty system board	Faulty system board. See "Troubleshooting the System Board" in "Troubleshooting Your System."
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 "Troubleshooting the System Board" in "Troubleshooting Your System."
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 Memory Modules" and "Memory Module Installation Guidelines" in "Installing System Components."
4-3-3	Faulty system board	Faulty system board. See "Troubleshooting the System Board" in "Troubleshooting Your System."
4-3-4	Time-of-day clock stopped	See "Troubleshooting System Memory" in "Troubleshooting Your System." If the problem persists, see "Troubleshooting the System Board" in "Troubleshooting Your System."
4-4-1	Super I/O chip failure; faulty system board	Faulty system board. See "Troubleshooting the System Board" in "Troubleshooting Your System."
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.

Alert Messages

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

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Finding Software Solutions

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Software problems can be caused by:

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

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

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

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

Before You Begin

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

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

Troubleshooting Errors and Conflicts

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

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

Input Errors

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

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

Application Conflicts

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

IRQ Assignment Conflicts

Most PCI devices can share an IRQ 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	Remote access controller serial port (when applicable)
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	*Available*
IRQ6	Diskette-drive controller
IRQ7	*Available*
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	Integrated drive controller for the IDE CD-drive controller
IRQ15	Integrated drive controller for the SATA ports

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Running the System Diagnostics

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

Using Server Administrator Diagnostics

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

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

System Diagnostics Features

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

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

When to Use the System Diagnostics

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

Running the System Diagnostics

The system diagnostics can be run either from the utility partition on your hard drive or from a set of diskettes that you create using the *Dell OpenManage Server Assistant* CD.

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

From the Utility Partition

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

From the Diagnostics Diskettes

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

If the system fails to boot, see "Getting Help."

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

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

System Diagnostics Testing Options

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

Table 4-1 provides a brief explanation of testing options.

Table 4-1. System Diagnostics Testing Options

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

Using the Advanced Testing Options

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

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

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

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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: Always follow the instructions closely, and ensure that you review all information in "Safety Instructions" in the *System Information Guide*.

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

External Connections

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

Checking Basic Power Problems

1. If the power indicator on the system front panel does not indicate that power is available to the system, ensure that the power cable is securely connected to the power supply.
2. If the system is connected to a PDU or UPS, turn the PDU or UPS off and then on.
3. If the PDU or UPS is not receiving power, plug it into another electrical outlet. If it still is not receiving power, try another PDU or UPS.
4. Reconnect the system to the electrical outlet and turn on the system.
5. If the system still is not working properly, see "Troubleshooting the Power Supply."

Start-Up Routine

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

Table 5-1. Start-Up Routine Indications

Look/listen for:	Action

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

Checking the Equipment

This section provides troubleshooting procedures for external devices attached to the system, such as the monitor, keyboard, or mouse. Before you perform any of the procedures, see "External Connections."

Troubleshooting the Video Subsystem

Problem

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

Action

1. Check the system and power connections to the monitor.
2. Determine whether the system has monitors attached to both the front and rear video connectors.

   The system supports only one monitor attached to either the front or rear video connector. When a monitor is connected to the front panel, the back-panel video connector is disabled.

   If two monitors are attached to the system, disconnect one monitor. If the problem is not resolved, continue to the next step.
3. Check the system and power connections to the monitor.
4. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

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

   If the tests fail, see "Getting Help."

Troubleshooting the Keyboard

Problem

- 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."

If the test fails, continue to the next step.

2. Determine whether the system has monitors attached to both the front and back video connectors.

   The system supports only one monitor attached to either the front or back video connector. When a monitor is connected to the front panel, the back-panel video connector is disabled.

   If two monitors are attached to the system, disconnect one monitor. If the problem is not resolved, continue to the next step.

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

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

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

4. Swap the faulty keyboard with a working keyboard.

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

5. Run the keyboard test in the system diagnostics. See "Running the System Diagnostics."

   If the test fails, 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. Determine whether the system has monitors attached to both the front and back video connectors.

   The system supports only one monitor attached to either the front or back video connector. When two monitors are connected, the back-panel video connector is disabled.

   If two monitors are attached to the system, disconnect one monitor. If the problem is not resolved, continue to the next step.

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

   If you are using a USB mouse and it is not damaged, go to step 5.

   If you are using a PS/2 mouse and it is not damaged, go to step 6.

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

4. Swap the faulty mouse with a working mouse.

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

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

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

6. Run the pointing devices test in the system diagnostics. See "Running the System Diagnostics."

If the test fails, see "Getting Help."

Troubleshooting Basic I/O Functions

Problem

- Error message indicates a problem with a serial port.
- Device connected to a serial port is not operating properly.

Action

1. Enter the System Setup program and ensure that the serial port(s) 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 "Troubleshooting a Serial I/O Device."

Troubleshooting a Serial I/O Device

Problem

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

Action

1. Turn off the system and any peripheral devices connected to the serial port.
2. Swap the serial interface cable with a working cable, and turn on the system and the serial device.

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

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

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

If the problem persists, see "Getting Help."

Troubleshooting a USB Device

Problem

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

Action

1. Enter the System Setup program, and ensure that the USB ports are enabled. See "Using the System Setup Program" in your *User's Guide*.
2. Turn off the system and any USB devices.
3. Disconnect the USB devices, and connect the malfunctioning device to the other USB connector.
4. Turn on the system and the reconnected device.

   If the problem is resolved, the USB connector might be defective. See "Getting Help."
5. If possible, swap the interface cable with a working cable.

   If the problem is resolved, replace the interface cable. See "Getting Help."
6. Turn off the system and the USB device, and swap the device with a comparable device.
7. Turn on the system and the USB device.

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

   If the problem persists, see "Getting Help."

Troubleshooting a Network Adapter

Problem

- Network adapter cannot communicate with network.

Action

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

   If the tests fail, continue to the next step.
2. Check the appropriate indicator on the NIC connector. See "Table 2-2" in "Indicators, Messages, and Codes."
   - If the link indicator does not light, check all cable connections.
   - 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 network adapter's documentation.
   - Change the autonegotiation setting, if possible.
   - Use another connector on the switch or hub.

   If you are using a network adapter card instead of an integrated network adapter, see the documentation for the network adapter card.
3. Ensure that the appropriate drivers are installed and the protocols are bound. See the network adapter's documentation.
4. Enter the System Setup program and confirm that the network adapters are enabled. See "Using the System Setup Program" in your User's Guide.
5. Ensure that the network adapters, hubs, and switches on the network are all set to the same data transmission speed. See the network equipment documentation.
6. Ensure that all network cables are of the proper type and do not exceed the maximum length. See "Network Cable Requirements" in your *User's Guide*.

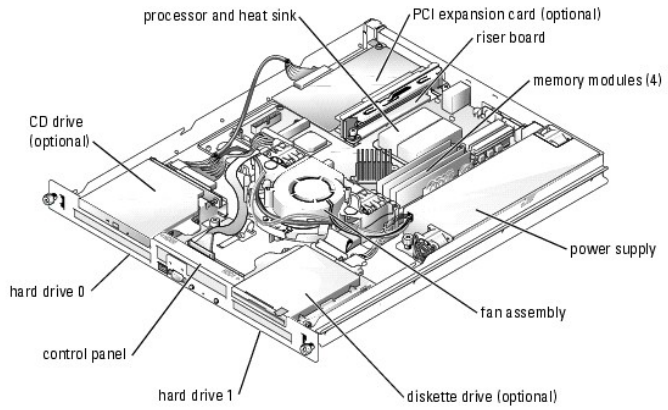
Responding to a Systems Management Software Alert Message

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

Inside the System

In Figure 5-1, the bezel and system cover are removed to provide an interior view of the system.

Figure 5-1. Inside the System



The system board holds the system's control circuitry and other electronic components. Several hardware options such as the processor and memory are installed directly on the system board. Using a riser board, the system can accommodate up to two expansion cards. The upper slot supports PCI 32-bit, 33-MHz (5.0 V) expansion cards and the lower slot supports PCI-X 64-bit, 66-MHz (3.3 V) expansion cards.

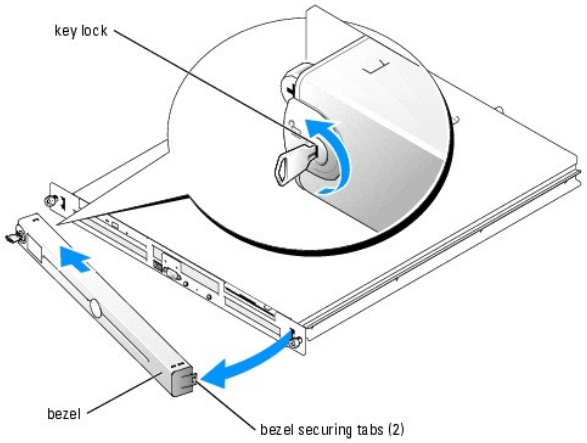
The hard-drive bays provide space for up to two SATA or SCSI drives, an optional CD drive, and an optional diskette drive. The SCSI hard drives must be connected to a controller card. Power is supplied to the system board, hard drives, and internal peripherals through a single nonredundant power supply.

Opening the System

The system is enclosed by an optional bezel and cover. To upgrade or troubleshoot the system, remove the bezel and cover to access the CD and diskette drives, hard drives, power supply, and other internal system components.

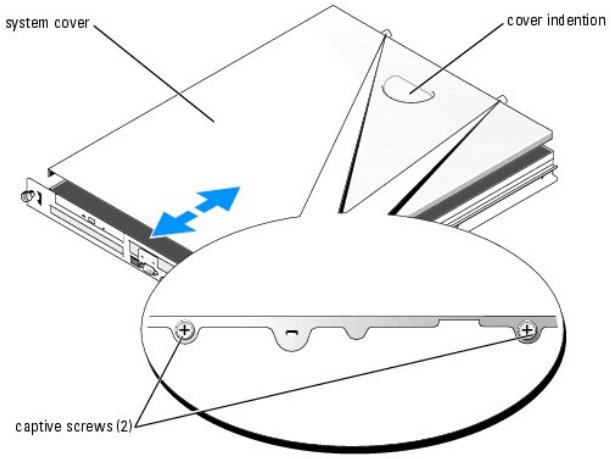
1. If applicable, remove the bezel. See Figure 5-2.
    a. If applicable, unlock the bezel.
    b. While grasping the bezel, slide it toward the key lock.
    c. Rotate the right side of the bezel away from the front panel.
    d. Pull the bezel away from the system.

Figure 5-2. Installing and Removing the Bezel



2. Observe the precautions in "Safety First—For You and Your System."
3. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
4. To remove the system cover, loosen the two captive screws at the back of the system. See Figure 5-3.
5. While pressing down on the cover indention, slide the cover backward about an inch, and grasp the cover on both sides.
6. Carefully lift the cover away from the system.

Figure 5-3. Installing and Removing the System Cover



Closing the System

1. Ensure that you did not leave tools or parts inside the system.
2. Place the cover over the sides of the chassis, and slide the cover forward until it snaps into place. See Figure 5-3.
3. Tighten the two captive screws at the back of the system to secure the cover.
4. To replace the bezel. See Figure 5-2.
    a. Align the hole in the left-side bezel securing tab with the tab on the front panel.
    b. While rotating the bezel toward the front panel, slide the bezel toward the key lock until the bezel snaps into place.
5. Reconnect the system to the electrical outlet, and turn on the system.

Troubleshooting a Wet System

Problem

- Liquid spilled on the system.
- Excessive humidity.

Action

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system. See "Opening the System."
3. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Options."
4. Let the system dry thoroughly for at least 24 hours.
5. Close the system. See "Closing the System."
6. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.

   If the system does not start properly, see "Getting Help."
7. If the system starts properly, shut down the system and reinstall all of the expansion cards that you removed. See "Installing an Expansion Card" in "Installing System Options."
8. Run the system board tests in the system diagnostics to confirm that the system is working properly. See "Running the System Diagnostics."

   If the tests fail, see "Getting Help."

Troubleshooting a Damaged System

Problem

- System was dropped or damaged.

Action

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

1. Open the system. See "Opening the System."
2. Ensure that the following components are properly installed:
   - Expansion cards
   - Power supply
   - Fans
   - Hard drive connections
3. Ensure that all cables are properly connected.
4. Close the system. See "Closing the System."
5. Run the system board tests in the system diagnostics. See "Running the System Diagnostics."

   If the tests fail, see "Troubleshooting the System Board."

Troubleshooting the System Battery

Problem

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

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

Action

1. Re-enter the time and date through the System Setup program. See "Using the System Setup Program" in your *User's Guide*.
2. Turn off the system and disconnect it from the electrical outlet for at least one hour.
3. Reconnect the system to the electrical outlet and turn on the system.
4. Enter the System Setup program.

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

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

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

Troubleshooting the Power Supply

Problem

- The power LED on the front of the system is not lit.

Action

1. Check the connection of the power cable to the power supply and the outlet.
2. Remove the bezel. See "Opening the System."
3. Turn on the system.

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

4. Open the system. See "Opening the System."
5. Ensure that the power supply cable is properly connected to the backplane board.
6. Close the system. See "Closing the System."

If the problem is still not resolved, replace the power supply. See "Power Supply" in "Installing System Components."

Troubleshooting System Cooling Problems

Problem

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

Action

Ensure that none of the following conditions exist:

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

Troubleshooting a Fan

Problem

- System-status indicator is amber.
- Systems management software issues a fan-related error message.

Action

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

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

2. Open the system. See "Opening the System."
3. Ensure that the fan assembly's power cable is firmly attached to the fan power connector on the system board. See "Fan Assembly" in "Installing System Components."

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

4. If the problem is not resolved, install a new fan assembly. See "Fan Assembly" in "Installing System Components."

If the replacement fan assembly is working properly, close the system. See "Closing the System."

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

Troubleshooting the Diskette Drive

Problem

- Error message indicates a diskette drive problem.

Action

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. Remove the bezel. See "Opening the System."
3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."
4. Run the diskette drive tests to check whether the diskette drive works correctly. See "Running the System Diagnostics."

If the tests fail, continue to the next step.

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

5. Open the system. See "Opening the System."
6. Ensure that the diskette drive interface cable is securely connected to the diskette drive and the control-panel board.
7. Close the system. See "Closing the System."
8. Run the diskette drive tests to see whether the diskette drive works correctly.
9. Open the system. See "Opening the System."
10. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Options."
11. Close the system. See "Closing the System."
12. Run the diskette drive tests 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."

13. Open the system. See "Opening the System."
14. Reinstall one of the expansion cards that you removed in step 10. See "Installing an Expansion Card" in "Installing System Options."
15. Close the system. See "Closing the System."
16. Run the diskette drive tests to see whether the diskette drive works correctly.
17. Repeat step 13 through step 16 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 the CD Drive

Problem

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

Action

1. Try using a different CD that you know works properly.
2. 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*.
3. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."
4. Run the IDE devices tests in the system diagnostics to determine whether the drive works correctly. See "Running the System Diagnostics."

If the tests fail, continue to the next step.

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

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

6. Ensure that the CD interface cable is securely connected to the CD drive and to the system board.
7. Ensure that a power cable is properly connected to the drive.
8. Close the system. See "Closing the System."
9. Reconnect the system to the electrical outlet, and turn on the system and attached peripherals.
10. Run the IDE devices tests in the system diagnostics to determine whether the CD drive works correctly.

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

Troubleshooting a SATA Hard Drive

Problem

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

Action

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

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

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

If the test fails, continue to the next step.

2. Enter the System Setup program and verify that the system is configured correctly. See "Using the System Setup Program" in your *User's Guide*.
3. Run the hard drive tests in the system diagnostics. See "Running the System Diagnostics."

If the tests fail, continue to the next step.

4. Open the system. See "Opening the System."
5. Ensure that the hard-drive interface cable is properly connected between the drive and the system board.

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

6. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."
7. Ensure that the power cable is properly connected to the drive.
8. Close the system. See "Closing the System."
9. 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 SCSI Hard Drive

Problem

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

Action

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

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

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

   If the test fails, continue to the next step.

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

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

   If the tests fail, continue to the next step.

3. Restart the system and enter the SCSI configuration utility.

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

4. Ensure that the primary SCSI channel is enabled, and restart the system. Use the SCSI controller documentation.
5. Ensure that the required device drivers are installed and configured correctly. See the *Dell OpenManage Server Assistant* CD.
6. Open the system. See "Opening the System."
7. Ensure that the hard-drive interface cable is properly connected between the drive and the controller card. See the documentation supplied with the controller card.
8. If the hard drive is the boot drive, ensure that the drive is configured and connected properly. See "Configuring the Boot Drive" in "Installing Drives."
9. Ensure that a power cable is properly connected to the drive.
10. Ensure that the hard drive is configured with a unique SCSI ID number and that the drive is terminated or not terminated as appropriate. See the documentation for the hard drive.
11. Close the system. See "Closing the System."

    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 Expansion Cards

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

Problem

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

Action

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

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

2. Open the system. See "Opening the System."
3. Ensure that each expansion card is firmly seated in its connector. See "Expansion Cards" in "Installing System Components."
4. Close the system. See "Closing the System."
5. Run the appropriate tests in the system diagnostics. See "Running the System Diagnostics."

If the problem persists, continue to the next step.

6. Open the system. See "Opening the System."
7. Remove all expansion cards installed in the system. See "Removing an Expansion Card" in "Installing System Components."
8. Close the system. See "Closing the System."
9. Run **Quick Tests** in the system diagnostics.

   If the tests fail, see "Getting Help."
10. For each expansion card that you removed in step 7, perform the following steps:
    a. Open the system. See "Opening the System."
    b. Reinstall one of the expansion cards.
    c. Close the system. See "Closing the System."
    d. Run the appropriate tests in the system diagnostics.

       If the tests fail, see "Getting Help."

If you reinstall all of the expansion cards and the tests fail, see "Getting Help."

Troubleshooting System Memory

Problem

- Faulty memory module.
- Faulty system board.

Action

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

1. Ensure that the memory modules are properly installed. See "Memory Module Installation Guidelines" in "Installing System Components."
2. Run the appropriate online diagnostic test. See "Using Server Administrator Diagnostics" in "Running System Diagnostics."

   If the test fails, continue to the next step.
3. Reboot the system.

   If an error message does not appear, continue to the next step.

   If an error message appears, go to step 5.
4. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.

   If the amount of memory installed matches the system memory setting, go to step 12.
5. Open the system. See "Opening the System."
6. Reseat the memory modules in their sockets. See "Installing Memory Modules" in "Installing System Options."
7. Close the system. See "Closing the System."
8. Enter the System Setup program and check the system memory setting. See "Using the System Setup Program" in your *User's Guide*.

If the amount of memory installed does not match the system memory setting, then perform the following steps:

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

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

NOTE: Several configurations for memory modules exist; see "Memory Module Installation Guidelines" in "Installing System Options."

c. Swap the memory module in socket DIMM1_A with another of the same capacity. See "Installing Memory Modules" in "Installing System Options."

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

9. Reconnect the system to its electrical outlet, and turn on the system and attached peripherals.
10. As the system boots, observe the monitor screen and the indicators on the keyboard.
11. Repeat step 8 through step 10 for each memory module installed.

If the problem persists, see "Getting Help."

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

If the test fails, see "Getting Help."

Troubleshooting the Processor

Problem

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

Action

CAUTION: See your *System 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. Open the system. See "Opening the System."
3. Ensure that the processor and heat sink are properly installed. See "Replacing the Processor" in "Installing System Options."
4. Close the system. See "Closing the System."
5. Run **Quick Tests** in the system diagnostics. See "Running the System Diagnostics."

If the test fails, continue to the next step.

6. Open the system. See "Opening the System."
7. Replace the processor. See "Replacing the Processor."
8. Close the system. See "Closing the System."
9. Run **Quick Tests** in the system diagnostics. See "Running the System Diagnostics."

If the tests fail or the problem persists, see "Getting Help."

Troubleshooting the System Board

Problem

- Error message indicates a system board problem.

Action

1. Open the system. See "Opening the System."
2. Remove the expansion cards, if installed. See "Removing an Expansion Card" in "Installing System Components."
3. Close the system. See "Closing the System."
4. Run the system board tests in the system diagnostics. See "Running the System Diagnostics."

   If the tests do not run successfully, see "Getting Help."
5. Open the system. See "Opening the System."
6. Reinstall the one of the expansion cards that you removed in step 2. See "Installing an Expansion Card" in "Installing System Components."
7. Close the system. See "Closing the System."
8. Run the system board tests again.

   If the tests do not complete successfully, the expansion card might be faulty. See "Getting Help."

   If the tests complete successfully, repeat step 5 through step 8 for the remaining expansion card, if applicable.

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Installing System Components

Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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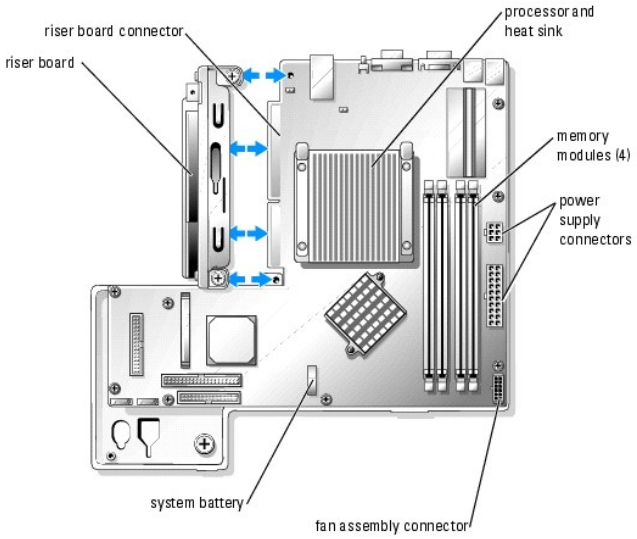
This section describes how to install the following system components:

- Cooling shroud
- System battery
- Fan assembly
- Power supply
- Expansion cards
- Riser board
- System memory
- Processor

System Board Components

When installing and replacing system board components, use Figure 6-1 to locate the components.

Figure 6-1. System Board Components and Connectors



Cooling Shroud

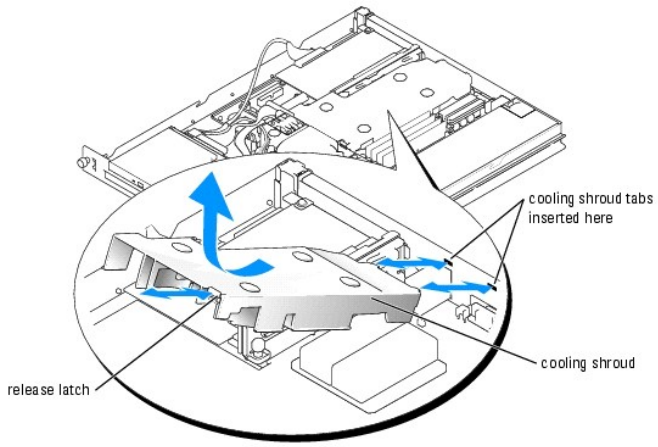
The cooling shroud covers the processor and system battery. The shroud also directs air flow to the expansion cards and system memory.

Removing the Cooling Shroud

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. While grasping the cooling shroud, press the release latch and rotate away from the fan assembly. See Figure 6-2.
3. Remove the cooling shroud.

Figure 6-2. Installing and Removing the Cooling Shroud



Installing the Cooling Shroud

1. Insert the two tabs of the cooling shroud into the back panel. See Figure 6-2.
2. Rotate the cooling shroud down until the release latch snaps into place securing the shroud to the fan assembly.
3. Close the system. See "Closing the System" in "Troubleshooting Your System."

System Battery

Replacing the System Battery

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

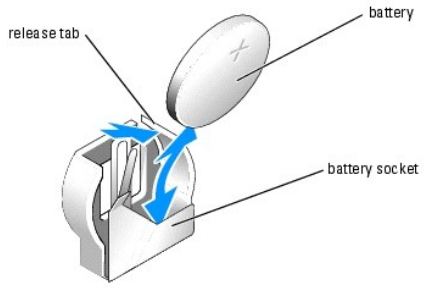
1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens.

   See "Using the System Setup Program" in the *User's Guide*.
2. Open the system. See "Opening the System" in Troubleshooting Your System."
3. Remove the cooling shroud. See "Removing the Cooling Shroud."
4. Locate the battery on the system board. See Figure A-3 for the battery location.

5. Grasp the battery socket release tab with your fingers and gently pull out away from the battery to remove the battery from the battery socket. See Figure 6-3.
6. Place the new battery in the battery socket as shown in Figure 6-3.

NOTE: The side of the battery labeled "+" must face toward the open side of the battery socket.

Figure 6-3. Replacing the Battery



7. Press the battery into the socket until it snaps into place.
8. Install the cooling shroud. See "Installing the Cooling Shroud."
9. Close the system. See "Closing the System" in "Troubleshooting Your System."
10. Enter the System Setup program to confirm that the battery operates properly.
11. 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.

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

Fan Assembly

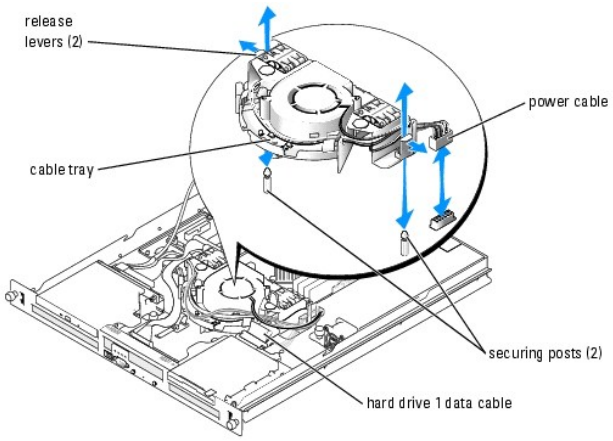
The fan assembly contains three fans and provides cooling for the processor, memory modules, and expansion cards.

Removing the Fan Assembly

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Remove the cooling shroud. See "Removing the Cooling Shroud."
3. Disconnect the fan assembly's power cable from the system board. See Figure 6-4.
4. Remove the data cable from hard drive 1 and pull it out of the fan assembly's cable tray. See Figure 6-4.
5. While pressing the two release levers on the fan assembly, lift the fan assembly off the two securing post and out of the chassis. See Figure 6-4.

Figure 6-4. Installing and Removing the Fan Assembly



Installing a Fan Assembly

1. Align the holes in the fan assembly with the two fan assembly securing posts.
2. Lower the fan assembly until the release levers snap onto the securing posts.
3. Route the hard drive 1 data cable in the fan assembly cable tray.
4. Reconnect the hard drive 1 data cable to the hard drive.
5. Reconnect the fan assembly power cable to the connector on the system board. See Figure 6-4.
6. Install the cooling shroud. See "Installing the Cooling Shroud."
7. Close the system. See "Closing the System" in "Troubleshooting Your System."

Power Supply

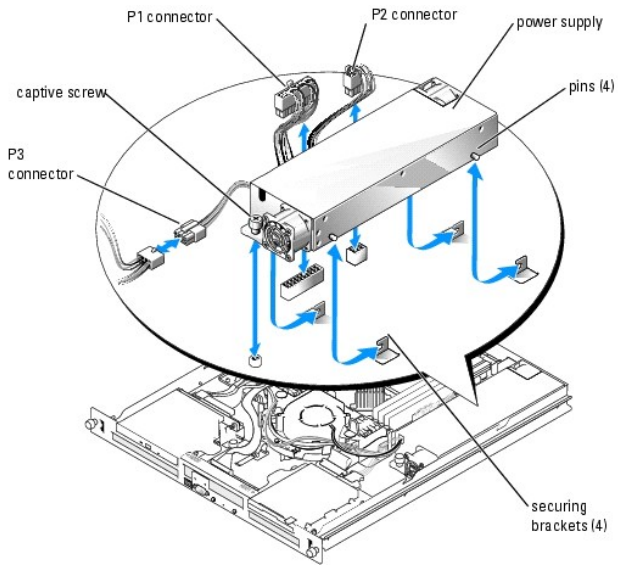
The system supports a single nonredundant power supply.

Removing the Power Supply

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Disconnect the following power supply cables:
   a. P3 from the hard drive cable harness
   b. P2 from system board connector CN2
   c. P1 from system board connector CN1
3. Loosen the captive screw at the front of the power supply that secures the power supply to the chassis. See Figure 6-5.
4. Slide the power supply forward and lift straight up to remove the power supply from the chassis.

Figure 6-5. Installing and Removing the Power Supply



Installing the Power Supply

1. Lower the power supply into the chassis and slide it backward until the four pins on the power supply are engaged into the securing brackets.
2. Tighten the captive screw at the front of the power supply that secures the power supply to the chassis.
3. Connect the following power supply cables:
   a. P3 to the hard drive cable harness
   b. P2 to the system board connector CN2
   c. P1 to the system board connector CN3
4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Expansion Cards

The system supports up to two PCI expansion cards, which are installed in connectors on a riser board. The upper slot supports PCI 32-bit, 33-MHz (5.0 V) expansion cards and the lower slot supports PCI-X 64-bit, 66-MHz (3.3 V) expansion cards. See Figure A-4. If you are installing a remote access controller card, it must be installed in the upper slot of the riser board. Install most RAID controller cards and SCSI controllers in the lower slot.

Installing an Expansion Card

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Remove the expansion-card retainer adjacent to the PCI slots. See Figure 6-6.
3. Remove the filler bracket on the slot you will be using.

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

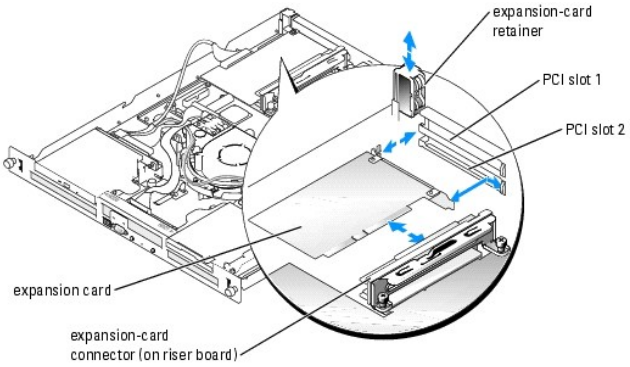
4. Insert the expansion card firmly into the expansion-card connector on the riser board until the card is fully seated, being careful not to remove the riser board from the system board.

   NOTE: Ensure that the expansion-card bracket is also inserted into the securing slot on the chassis's back panel.

5. Replace the expansion-card retainer. See Figure 6-6.

6. Connect any internal or external cable(s) to the expansion card.
7. Close the system. See "Closing the System" in "Troubleshooting Your System."

Figure 6-6. Installing and Removing Expansion Cards



Removing an Expansion Card

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Disconnect any internal or external cable(s) that are connected to the expansion card.
3. Remove the expansion-card retainer adjacent to the PCI slots. See Figure 6-6.
4. Grasp the expansion card and carefully pull it away from the riser-board connector.

   If you are removing a SCSI controller card, disconnect the cables from the card that connects to the SCSI hard drives.
5. If you are permanently removing the card, replace the metal filler bracket over the empty card-slot opening.

   NOTE: Filler brackets must be installed over empty expansion-card slots to maintain FCC certification of the system. The brackets also keep dust and dirt out of the system and aid in proper cooling and airflow inside the system.
6. Replace the expansion-card retainer.
7. Close the system. See "Closing the System" in "Troubleshooting Your System."

Riser Board

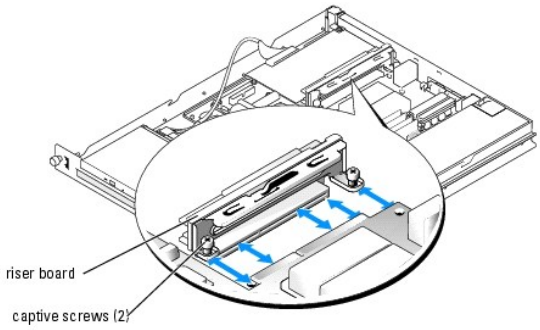
The riser board provides two expansion-card slots.

Removing the Riser Board

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Remove any expansion card(s). See "Removing an Expansion Card."
3. Loosen the two captive screws that secure the riser board to the system board. See Figure 6-7.
4. From the back of the system, slide the riser board to the right to disconnect the riser board from the system board, and lift the riser board out of the chassis.

Figure 6-7. Installing and Removing the Riser Board



Installing the Riser Board

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

1. Slide the riser board onto the system board. See Figure 6-7.
2. Tighten the two captive screws that secure the riser board to the system board. See Figure 6-7.
3. Install any expansion card(s). See "Installing an Expansion Card."
4. Close the system. See "Closing the System" in Troubleshooting Your System."

System Memory

The four memory module sockets are located on the system board adjacent to the power supply and can accommodate from 256 MB to 4 GB of unbuffered ECC PC-3200 (DDR400) memory. See Figure 6-1 for the location of the memory module sockets.

You can upgrade the system memory by installing combinations of 256-, 512-MB, and 1-GB unbuffered memory modules. If you receive an error message stating that maximum memory has been exceeded, see "Indicators, Messages, and Codes" for more information. You can purchase memory upgrade kits from Dell.

NOTE: The memory modules must be PC-3200 compliant.

Memory Module Installation Guidelines

The memory module sockets are arranged in banks (1 and 2) on two channels (A and B). The memory module banks must be installed in identical pairs.

The memory module banks are identified as follows:

Bank 1: DIMM1_A and DIMM1_B

Bank 2: DIMM2_A and DIMM2_B

For example, if socket DIMM1_A contains a 256-MB memory module, then socket DIMM1_B must contain a 256-MB memory module.

Table 6-1 shows examples of different memory configurations.

- If only one memory module is installed, it must be installed in the DIMM1_A socket.

- A bank must contain identical memory modules.
- Install the memory modules in bank 1 (DIMM1_*x*) before installing memory modules in bank 2 (DIMM2_*x*).
- Installing three memory modules is not supported.

Table 6-1. Sample Memory Module Configurations

Total Memory	DIMM1_A	DIMM2_A	DIMM1_B	DIMM2_B
256 MB	256 MB	None	None	None
512 MB	256 MB	None	256 MB	None
1 GB	256 MB	256 MB	256 MB	256 MB
1 GB	512 MB	None	512 MB	None
1.5 GB	512 MB	256 MB	512 MB	256 MB
2 GB	1 GB	None	1 GB	None
2 GB	512 MB	512 MB	512 MB	512 MB
3 GB	1 GB	512 MB	1 GB	512 MB
4 GB	1 GB	1 GB	1 GB	1 GB

Installing Memory Modules

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Locate the memory module sockets. See Figure 6-1.
3. Press the ejectors on the memory module socket down and out, as shown in Figure 6-8, to allow the memory module to be inserted into the socket.
4. Align the memory module's edge connector with the alignment keys of the memory module socket, and insert the memory module in the socket.

   NOTE: The memory module socket has two alignment keys that allow you to install the memory module in the socket in only one way.

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

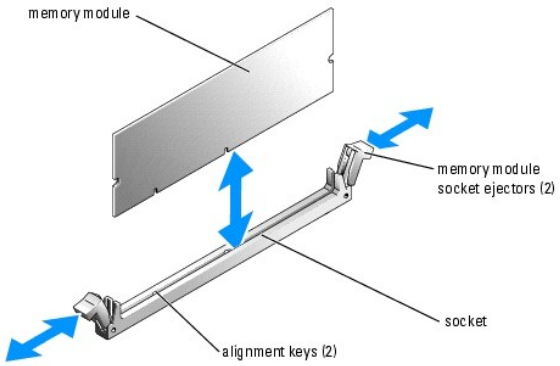
   When the memory module is properly seated in the socket, the ejectors on the memory module socket align with the ejectors on the other sockets that have memory modules installed.

6. Repeat step 2 through step 5 of this procedure to install the remaining memory modules. See Table 6-1 for installing the total desired memory.
7. Close the system. See "Closing the System" in "Troubleshooting Your System."
8. (Optional) Press <F2> to enter the System Setup program, and check the **System Memory** setting on the main **System Setup** screen.

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

9. If the value is incorrect, one or more of the memory modules may not be installed properly. Repeat step 1 through step 8 of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.
10. Run the system memory test in the system diagnostics. See "Running the System Diagnostics."

Figure 6-8. Installing and Removing a Memory Module



Removing Memory Modules

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

1. Open the system. See "Opening the System" in Troubleshooting Your System."
2. Locate the memory module sockets. See Figure 6-1.
3. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket. See Figure 6-8.
4. Close the system. See "Closing the System" in "Troubleshooting Your System."

Processor

It is possible to upgrade your processor to take advantage of future options in speed and functionality. Each processor and its associated internal cache memory are contained in a pin grid array (PGA) package that is installed in a ZIF socket on the system board.

The following items are included in the processor upgrade kit:

- Processor
- Heat sink

Replacing the Processor

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

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

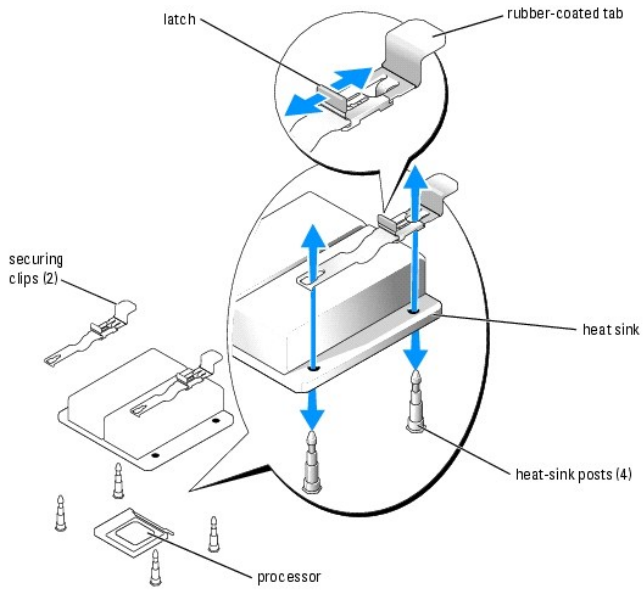
NOTICE: The processor and heat sink can become extremely hot. Be sure the processor has had sufficient time to cool before handling.

2. Remove the cooling shroud. See "Removing the Cooling Shroud."
3. Pushing down with one hand on the securing clip's rubber-coated tab, use the other hand to slide the latch on the securing clip away from the heat-sink post to release the securing clip. See Figure 6-9.
4. Remove the securing clip.

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

5. Repeat step 3 and step 4 to remove the other securing clip.

Figure 6-9. Installing and Removing the Securing Clip



NOTE: When removing the heat sink, the possibility exists that the processor might adhere to the heat sink and be removed from the socket. It is recommended that you remove the heat sink while the processor is still warm.

6. Remove the heat sink.
   a. Gently rotate the heat sink side-to-side before lifting the heat sink from the processor.
   b. If the processor is removed from the socket with the heat sink, twist or slide the processor off of the heat sink. Do not pry the processor off of the heat sink.
   c. Set the heat sink upside down so as not to contaminate the thermal grease.
7. Pull the socket-release lever straight up until the processor is released from the socket. See Figure 6-10.
8. Lift the processor out of the socket and leave the release lever up so that the socket is ready for the new processor.

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

9. Unpack the new processor.

   If any of the pins on the processor appear bent, see "Getting Help."

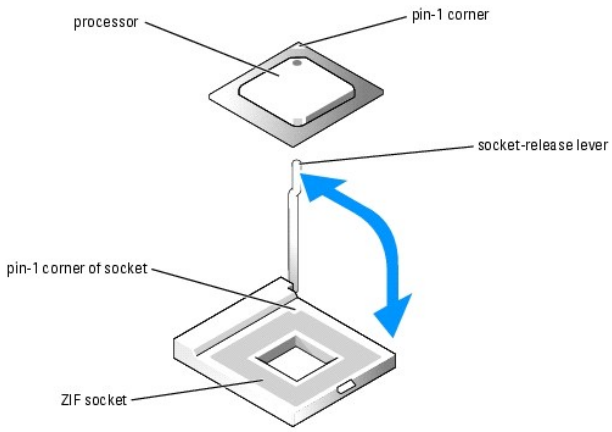
10. Align the pin-1 corner of the processor with the pin-1 corner of the ZIF socket. See Figure 6-10.

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

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

11. Install the processor in the socket.

Figure 6-10. Installing and Removing the Processor in the Socket



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

If the release lever on the processor socket is not positioned all the way up, move it to that position.

With the pin-1 corners of the processor and socket aligned, set the processor lightly in the socket, making sure all pins are matched with the correct holes in the socket. Because the system uses a ZIF processor socket, do not use force, which could bend the pins if the processor is misaligned. When the processor is positioned correctly, it drops down into the socket with minimal pressure.

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

12. Install the heat sink.
    a. Using a clean lint-free cloth, remove the existing thermal grease from the heat sink.

    NOTE: Use the heat sink that you removed in step 6.

    b. Apply thermal grease evenly to the top of the processor.
    c. Align the holes on both sides of the heat sink with the heat-sink posts on the system chassis. See Figure 6-9.
13. Orient the securing clips so that the rubber-coated tabs are toward the back of the chassis.

    NOTE: If the securing clips are installed so that the rubber-coated tabs are toward the front of the system, the cooling shroud cannot be installed correctly.

14. Lower the end opposite of the rubber-coated tab of each securing clip over the heat-sink post, and then slide the securing clip toward the heat-sink post until they snap onto the post. See Figure 6-9.
15. While holding down the rubber-coated tab with one hand, push the latch on the securing clip toward the heat-sink post until it locks the clip onto the post.
16. Repeat step 14 and step 15 for the other securing clip.
17. Install the cooling shroud. See "Installing the Cooling Shroud."
18. Close the system. See "Closing the System" in "Troubleshooting Your System."

As the system boots, it detects the presence of the new processor and automatically changes the system configuration information in the System Setup program.

19. Press <F2> to enter the System Setup program, and check that the processor information matches the new system configuration.

See your User's Guide for instructions about using the System Setup program.

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

See "Running the System Diagnostics" for information about running the diagnostics and troubleshooting processor problems.

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Installing Drives

Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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The hard-drive bays provide space for up to two SATA or SCSI drives, an optional CD drive, and an optional diskette drive. The SCSI hard drives must be connected to a controller card. The interface and power cables for the hard drives are routed in a cable tray that is part of the fan assembly.

CD and Diskette Drives (Optional)

The optional CD drive is mounted in a bracket using two alignment pins and a spring clip on top of hard drive 0. An interposer card is connected to the back of the CD drive which allows the drive to be connected to the Pri-IDE connector on the system board.

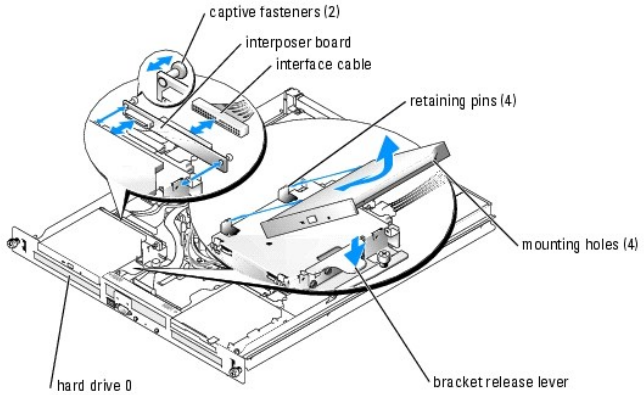
The optional diskette drive is mounted in a bracket such as the CD drive on top of hard drive 1. The diskette drive's interface cable is connected to the Control Panel.

Removing the Optional CD Drive

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

1. Open the system. See "Opening the System" in "Troubleshooting Your System."
2. Disconnect the power and interface cables from the CD drive's interposer card.
3. Release the two captive fasteners that secure the interposer card to the hard drive 0 carrier. See Figure 7-1.
   a. On the side of the card that is between the card and the drive, push the plunger of each fastener back into the fastener barrel, using the flat surface of a flat-tipped screwdriver or other small flat object.
   b. On the side of the interposer card closest to the system board, grasp the plunger head and pull the plunger until it stops.
4. Disconnect the interposer card from the CD drive.
5. Press the bracket release lever that secures the CD drive to the hard drive 0 carrier. See Figure 7-2.
6. Lift and tilt the CD drive up and out of the bracket as shown in Figure 7-2.

Figure 7-1. Removing and Installing the Optional CD Drive



Installing the Optional CD Drive

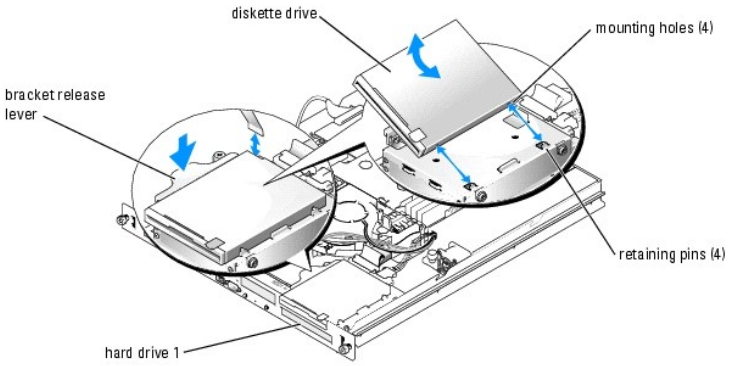
1. Align the CD drive's mounting holes with the retaining pins on the hard drive 0 bracket. See Figure 7-1.
2. Rotate the drive downward until it snaps into place.
3. Connect the interposer card to the CD drive.
4. Push the plungers into the captive fastener barrels until they snap into place.
5. Connect the interface and power cables to the CD drive's interposer card
6. Close the system. See "Closing the System" in "Troubleshooting Your System."

Removing the Optional Diskette Drive

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

1. Open the system. See "Opening the System" in "Troubleshooting Your System."
2. Disconnect the interface cable from the diskette drive.
3. Press the bracket release lever that secures the diskette drive to the hard drive 1 carrier. See Figure 7-2.
4. Lift and tilt the diskette drive up and out of the bracket as shown in Figure 7-2.

Figure 7-2. Removing and Installing the Optional Diskette Drive



Installing the Optional Diskette Drive

1. Align the diskette drive's mounting holes with the retaining pins on the hard drive 1 bracket. See Figure 7-2.
2. Rotate the drive downward until it snaps into place.
3. Connect the interface cable to the diskette drive.
4. Close the system. See "Closing the System" in "Troubleshooting Your System."

SCSI Configuration Information

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

SCSI Interface Cables

SCSI interface connectors are keyed for correct insertion. Keying ensures that the pin-1 wire in the cable connects to pin 1 in the connectors on both ends.

When you disconnect an interface cable, take care to grasp the cable connector, rather than the cable itself, to avoid stress on the cable.

SCSI ID Numbers

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

- The SCSI hard drive from which the system boots is configured as SCSI ID 0.
- If you install optional SCSI drives or change your SCSI configuration, see the documentation for each SCSI drive for information on setting the appropriate SCSI ID number.

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

Device Termination

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

Configuring the Boot Drive

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

- To boot from a single SATA hard drive, the master drive (drive 0) must be connected to the SATA_PORT_0 connector on the system board. To identify system board connectors, see Figure A-3.
- To boot from a single SCSI hard drive, the drive must be connected to the SCSI controller card. See the documentation that accompanied the controller card.
- To boot from a SCSI RAID array, the drive must be connected to the RAID controller card. See the documentation that accompanied the controller card.

Hard Drives

Your system contains up to two non-hot-pluggable SATA or SCSI hard drives. If your system contains SCSI hard drives, they must be connected to a SCSI controller board. The cables for hard drive 1 are routed in the cable tray that is part of the fan assembly.

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

Removing a Hard Drive

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

1. Open the system. See "Opening the System" in "Troubleshooting Your System."
2. If applicable, remove the optional CD drive or optional diskette drive.

   Remove the CD drive if you are removing hard drive 0. See "Removing the Optional CD Drive."

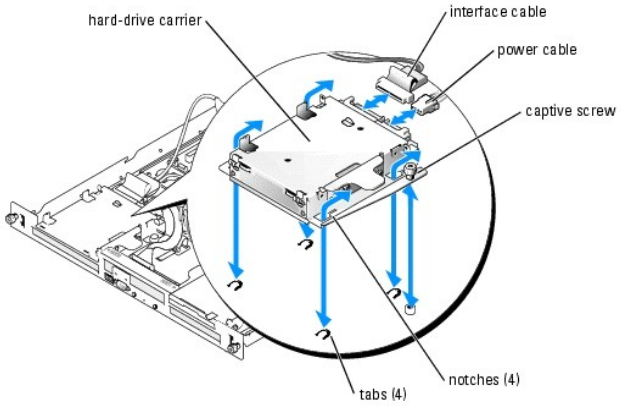
   Remove the optional diskette drive if you are removing hard drive 1. See "Removing the Optional Diskette Drive."
3. Disconnect the power and interface cables from the hard drive.

The interface cables for SATA hard drives are connected to the system board. See Figure A-3 for the location of the system board connectors.

The interface cables for SCSI hard drives are connected to a controller card.

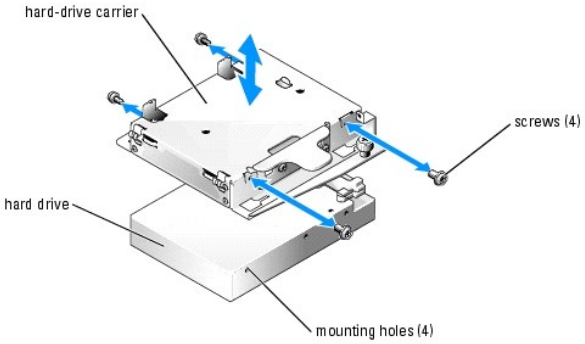
4. Loosen the captive screw that secures the hard-drive carrier to the chassis. See Figure 7-3.

Figure 7-3. Removing the Hard-Drive Carrier



5. Slide the hard-drive carrier backward and lift the carrier out of the chassis.
6. Using a #2 Phillips screwdriver, remove the four screws that secure the hard drive to the carrier and remove the drive from the carrier. See Figure 7-4.

Figure 7-4. Removing the Hard Drive From the Drive Carrier



Installing a Hard Drive

1. Align the hard-drive mounting holes with the holes in the drive carrier.
2. Using a #2 Phillips screwdriver, install the four screws that secure the hard drive to the carrier. See Figure 7-4.
3. Align the hard-drive carrier so that the tabs on the chassis slide into the notches in the carrier. See Figure 7-3.
4. Slide the carrier forward until it stops.
5. Tighten the captive screw that secures the hard-drive carrier to the chassis.
6. Connect the power and interface cables to the new drive.

The interface cables for SATA hard drives are connected to the system board. See Figure A-3 for the location of the system board connectors.

The interface cables for SCSI hard drives are connected to a controller card.

7. Install the CD drive or optional diskette drive.

Install the CD drive if you are removing hard drive 0. See "Installing the Optional CD Drive."

Install the optional diskette drive if you are removing hard drive 1. See "Installing the Optional Diskette Drive."

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

Installing a RAID or SCSI Controller Card

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

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Getting Help

Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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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.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.euro.dell.com (Europe only)

- Electronic Quote Service

sales@dell.com

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

sales_canada@dell.com (Canada only)

- 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 *System Information Guide* for important safety information.

Diagnostics Checklist
Name:
Date:
Address:
Phone number:
Service Tag (bar code on the back of the computer):
Express Service Code:
Return Material Authorization Number (if provided by Dell support technician):
Operating system and version:
Peripherals:
Expansion cards:
Are you connected to a network? Yes No
Network, version, and network card:
Programs and versions:
See your operating system documentation to determine the contents of the system's start-up files. If possible, print each file. Otherwise, record the contents of each file before calling Dell.
Error message, beep code, or diagnostic code:
Description of problem and troubleshooting procedures you performed:

Contacting Dell

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

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

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

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

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**	
	Tech Support and Customer Care	toll-free: 0-800-444-0733
	Sales	0-810-444-3355
	Tech Support Fax	11 4515 7139
	Customer Care Fax	11 4515 7138
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
	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) International Access Code: **900** Country Code: **43** City Code: **1**	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
	Home/Small Business Sales	0820 240 530 00
	Home/Small Business Fax	0820 240 530 49
	Home/Small Business Customer Care	0820 240 530 14
	Preferred Accounts/Corporate Customer Care	0820 240 530 16
	Home/Small Business Technical Support	0820 240 530 14
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	0820 240 530 00
Bahamas	General Support	toll-free: 1-866-278-6818
Barbados	General Support	1-800-534-3066
Belgium (Brussels) International Access Code: **00** Country Code: **32** City Code: **2**	Website: **support.euro.dell.com**	
	E-mail: tech_be@dell.com	
	E-mail for French Speaking Customers: **support.euro.dell.com/be/fr/emaildell/**	
	Technical Support	02 481 92 88
	Customer Care	02 481 91 19
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	General Support	1-800-342-0671
Bolivia	General Support	toll-free: 800-10-0238
Brazil International Access Code: **00** Country Code: **55** City Code: **51**	Website: **www.dell.com/br**	
	Customer Support, Technical Support	0800 90 3355
	Tech Support Fax	51 481 5470
	Customer Care Fax	51 481 5480
	Sales	0800 90 3390
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei Country Code: **673**	Customer Technical Support (Penang, Malaysia)	604 633 4966
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario) International Access Code: **011**	Online Order Status: **www.dell.ca/ostatus**	
	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	TechFax	toll-free: 1-800-950-1329
	Customer Care (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Customer Care (med./large business, government)	toll-free: 1-800-326-9463
	Technical Support (Home Sales/Small Business)	toll-free: 1-800-847-4096
	Technical Support (med./large bus., government)	toll-free: 1-800-387-5757
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago) Country Code: **56** City Code: **2**	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
China (Xiamen) Country Code: **86** City Code: **592**	Tech Support website: **support.ap.dell.com/china**	
	Tech Support E-mail: cn_support@dell.com	
	Tech Support Fax	818 1350
	Home and Small Business Technical Support	toll-free: 800 858 2437
	Corporate Accounts Technical Support	toll-free: 800 858 2333

	Customer Experience	toll-free: 800 858 2060
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2222
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: czech_dell@dell.com	
	Technical Support	02 2186 27 27
Country Code: **420**	Customer Care	02 2186 27 11
City Code: **2**	Fax	02 2186 27 14
	TechFax	02 2186 27 28
	Switchboard	02 2186 27 11
Denmark (Copenhagen)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail Support (portable computers): den_nbk_support@dell.com	
	E-mail Support (desktop computers): den_support@dell.com	
Country Code: **45**	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
	Fax Switchboard (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Fax Switchboard (Home/Small Business)	3287 5001
Dominica	General Support	toll-free: 1-866-278-6821
Dominican Republic	General Support	1-800-148-0530
Ecuador	General Support	toll-free: 999-119
El Salvador	General Support	01-899-753-0777
Finland (Helsinki)	Website: **support.euro.dell.com**	
International Access Code: **990**	E-mail: fin_support@dell.com	
	E-mail Support (servers): Nordic_support@dell.com	
Country Code: **358**	Technical Support	09 253 313 60
	Technical Support Fax	09 253 313 81
City Code: **9**	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)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/fr/fr/emaildell/**	
	Home and Small Business	
Country Code: **33**	Technical Support	0825 387 270
	Customer Care	0825 823 833
City Codes: **(1) (4)**	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339

	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen) International Access Code: **00** Country Code: **49** City Code: **6103**	Website: **support.euro.dell.com**	
	E-mail: tech_support_central_europe@dell.com	
	Technical Support	06103 766-7200
	Home/Small Business Customer Care	0180-5-224400
	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
Greece International Access Code: 00 Country Code: 30	Website: **support.euro.dell.com**	
	E-mail: support.euro.dell.com/gr/en/emaildell/	
	Technical Support	080044149518
	Gold Technical Support	08844140083
	Switchboard	2108129800
	Sales	2108129800
	Fax	2108129812
Grenada	General Support	toll-free: 1-866-540-3355
Guatemala	General Support	1-800-999-0136
Guyana	General Support	toll-free: 1-877-270-4609
Hong Kong International Access Code: **001** Country Code: **852**	Website: **support.ap.dell.com**	
	E-mail: ap_support@dell.com	
	Technical Support (Dimension™ and Inspiron™)	2969 3189
	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	2969 3191
	Technical Support (PowerApp™, PowerEdge™, PowerConnect™, and PowerVault™)	2969 3196
	Gold Queue EEC Hotline	2969 3187
	Customer Advocacy	3416 0910
	Large Corporate Accounts	3416 0907
	Global Customer Programs	3416 0908
	Medium Business Division	3416 0912
	Home and Small Business Division	2969 3105
India	Technical Support	1600 33 8045
	Sales	1600 33 8044
Ireland (Cherrywood) International Access Code: **16** Country Code: **353** City Code: **1**	Website: **support.euro.dell.com**	
	E-mail: dell_direct_support@dell.com	
	Technical Support	1850 543 543
	U.K. Technical Support (dial within U.K. only)	0870 908 0800
	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	1850 200 982
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	Fax/SalesFax	01 204 0103
	Switchboard	01 204 4444
Italy (Milan) International Access Code: **00** Country Code: **39** City Code: **02**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/it/it/emaildell/**	
	Home and Small Business	
	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55

	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	General Support (dial from within Jamaica only)	1-800-682-3639
Japan (Kawasaki) International Access Code: **001** Country Code: **81** City Code: **44**	Website: **support.jp.dell.com**	
	Technical Support (servers)	toll-free: 0120-198-498
	Technical Support outside of Japan (servers)	81-44-556-4162
	Technical Support (Dimension™ and Inspiron™)	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)	toll-free:0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (Axim™)	toll-free: 0120-981-690
	Technical Support outside of Japan (Axim)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Switchboard	044-556-4300
Korea (Seoul) International Access Code: **001** Country Code: **82** City Code: **2**	Technical Support	toll-free: 080-200-3800
	Sales	toll-free: 080-200-3600
	Customer Service (Seoul, Korea)	toll-free: 080-200-3800
	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	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 International Access Code: **00** Country Code: **352**	Website: **support.euro.dell.com**	
	E-mail: tech_be@dell.com	
	Technical Support (Brussels, Belgium)	3420808075
	Home/Small Business Sales (Brussels, Belgium)	toll-free: 080016884
	Corporate Sales (Brussels, Belgium)	02 481 91 00
	Customer Care (Brussels, Belgium)	02 481 91 19
	Fax (Brussels, Belgium)	02 481 92 99
	Switchboard (Brussels, Belgium)	02 481 91 00
Macao Country Code: **853**	Technical Support	toll-free: 0800 582
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-free: 0800 581
Malaysia (Penang) International Access Code: **00** Country Code: **60** City Code: **4**	Technical Support	toll-free: 1 800 888 298
	Customer Service	04 633 4949
	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213
Mexico International Access Code: **00** Country Code: **52**	Customer Technical Support	001-877-384-8979 or 001-877-269-3383
	Sales	50-81-8800 or 01-800-888-3355
	Customer Service	001-877-384-8979 or 001-877-269-3383
	Main	50-81-8800

		or 01-800-888-3355
Montserrat	General Support	toll-free: 1-866-278-6822
Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam) International Access Code: **00** Country Code: **31** City Code: **20**	Website: **support.euro.dell.com** E-mail (Technical Support): (Enterprise): nl_server_support@dell.com (Latitude): nl_latitude_support@dell.com (Inspiron): nl_inspiron_support@dell.com (Dimension): nl_dimension_support@dell.com (OptiPlex): nl_optiplex_support@dell.com (Dell Precision): nl_workstation_support@dell.com	
	Technical Support	020 674 45 00
	Technical Support Fax	020 674 47 66
	Home/Small Business Customer Care	020 674 42 00
	Relational Customer Care	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand International Access Code: **00** Country Code: **64**	E-mail (New Zealand): nz_tech_support@dell.com	
	E-mail (Australia): au_tech_support@dell.com	
	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) International Access Code: **00** Country Code: **47**	Website: **support.euro.dell.com**	
	E-mail Support (portable computers): nor_nbk_support@dell.com	
	E-mail Support (desktop computers): nor_support@dell.com	
	E-mail Support (servers): nordic_server_support@dell.com	
	Technical Support	671 16882
	Relational Customer Care	671 17514
	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw) International Access Code: **011** Country Code: **48** City Code: **22**	Website: **support.euro.dell.com**	
	E-mail: pl_support_tech@dell.com	
	Customer Service Phone	57 95 700
	Customer Care	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal International Access Code: **00** Country Code: **351**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/pt/en/emaildell/**	
	Technical Support	707200149
	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or

		800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	General Support	1-800-805-7545
St. Kitts and Nevis	General Support	toll-free: 1-877-441-4731
St. Lucia	General Support	1-800-882-1521
St. Vincent and the Grenadines	General Support	toll-free: 1-877-270-4609
Singapore (Singapore) International Access Code: **005** Country Code: **65**	Technical Support	toll-free: 800 6011 051
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-free: 800 6011 054
	Corporate Sales	toll-free: 800 6011 053
South Africa (Johannesburg) International Access Code: **09/091** Country Code: **27** City Code: **11**	Website: **support.euro.dell.com**	
	E-mail: dell_za_support@dell.com	
	Technical Support	011 709 7710
	Customer Care	011 709 7707
	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid) International Access Code: **00** Country Code: **34** City Code: **91**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/es/es/emaildell/**	
	Home and Small Business	
	Technical Support	902 100 130
	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Care	902 118 546
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby) International Access Code: **00** Country Code: **46** City Code: **8**	Website: **support.euro.dell.com**	
	E-mail: swe_support@dell.com	
	E-mail Support for Latitude and Inspiron: Swe-nbk_kats@dell.com	
	E-mail Support for OptiPlex: Swe_kats@dell.com	
	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
	Fax Technical Support	08 590 05 594
	Sales	08 590 05 185
Switzerland (Geneva) International Access Code: **00** Country Code: **41** City Code: **22**	Website: **support.euro.dell.com**	
	E-mail: swisstech@dell.com	
	E-mail for French-speaking HSB and Corporate Customers: **support.euro.dell.com/ch/fr/emaildell/**	
	Technical Support (Home and Small Business)	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan International Access Code: **002** Country Code: **886**	Technical Support (portable and desktop computers)	toll-free: 00801 86 1011
	Technical Support (servers)	toll-free: 0080 60 1256
	Transaction Sales	toll-free: 0080 651 228
	Corporate Sales	toll-free: 0080 651 227
Thailand	Technical Support	toll-free: 0880 060 07

International Access Code: **001** 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) International Access Code: **00** Country Code: **44** City Code: **1344**	Website: **support.euro.dell.com**	
	Customer Care website: **support.euro.dell.com/uk/en/ECare/Form/Home.asp**	
	E-mail: dell_direct_support@dell.com	
	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct/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) International Access Code: **011** Country Code: **1**	Automated Order-Status Service	toll-free: 1-800-433-9014
	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
	Consumer (Home and Home Office)	
	Technical Support	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	DellNet™ Service and Support	toll-free: 1-877-Dellnet (1-877-335-5638)
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Financial Services website: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	Business	
	Customer Service and Technical Support	toll-free: 1-800-822-8965
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Projectors Technical Support	toll-free: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Technical Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-234-1490
	Dell Sales	toll-free: 1-800-289-3355 or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)
U.S. Virgin Islands	General Support	1-877-673-3355
Venezuela	General Support	8001-3605

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Dell™ PowerEdge™ 750 Systems Installation and Troubleshooting Guide

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Notes, Notices, and Cautions

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

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

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

Abbreviations and Acronyms

For a complete list of abbreviations and acronyms, see the "Abbreviations and Acronyms."

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