Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

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.

Jumpers, Switches, and Connectors

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

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

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


Jumpers—A General Explanation

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

Jumpers

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

Figure A-1. Example Jumper
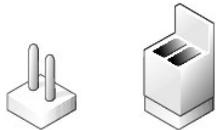
A jumper is referred to as open or unjumpered when the plug is pushed down over only one pin or if there is no plug at all. When the plug is pushed down over two pins, the jumper is referred to as jumpered. The jumper setting is often shown in text as two numbers, such as 1–2. The number 1 is printed on the circuit board 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
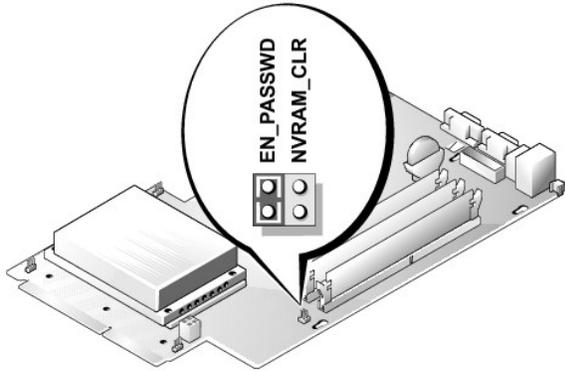
Table A-**1. System Board Jumper Settings**

Jumper	Setting	Description
EN_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 and for the location and description of the system board connectors.

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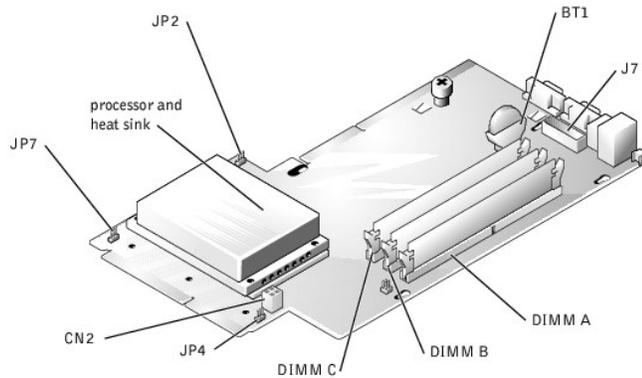
Table A-**2. System Board Connectors**

Connector	Description
JP7	Power connector for the processor fan
CN2	12 V power connector for the system board
JP4	Power connector for the memory modules fan
DIMM *n*	Memory modules (3)
J7	Power connector for the remote access card
BT1	Connector for the 3.0 V coin battery

JP2	Power connector for the expansion-card fan

Backplane Board Connectors

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

Figure A-4. Backplane Board Connectors
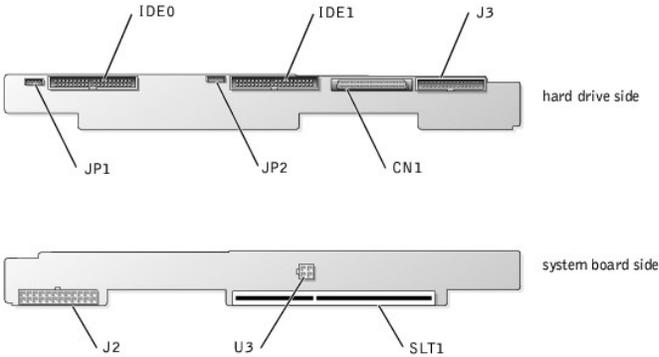
Table A-3. Backplane Board Connectors

Connector	Description
IDE0	Data interface connector for the IDE hard drive 0
JP1	Power connector for the IDE hard drive 0
IDE1	Data interface connector for the IDE hard drive 1
JP21	Power connector for the IDE hard drive 0
CN1	Interface connector for the CD/diskette drives
J3	Control panel interface connector
J2	Power supply connector
U3	+12 V connector
SLT1	System board interface connector

Riser Card Connectors

See <u>Figure A-5</u> and <u>Table A-4</u> for the location and description of the backplane board connectors.

Figure A-5. Riser Card Connectors

upper slot
PCI 33 MHz

lower slot
PCI-X 133 MHz
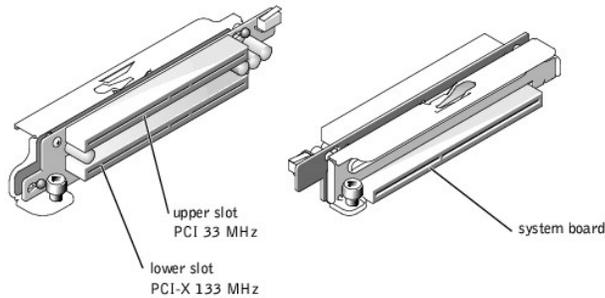
system board

Table A-4. Riser Card Connectors

Connector	Description
Upper slot PCI 33 MHz	DRAC III/XT must be installed in the upper slot.
Lower slot PCI-X 133 MHz	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.*

I/O Connectors

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

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

I/O Connectors

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

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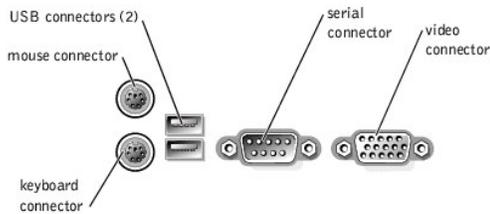
Table B-1 shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
IOIOI	Serial connector
⊣▢	Mouse connector
▥	Keyboard connector
▢	Video connector
⊷	USB 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
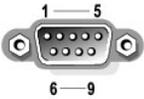
Table B-2. Serial Connector Pin Assignments

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
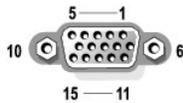
Table B-4. Video Connector Pin Assignments

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

NIC Connector

The system's NIC provides fast communication between servers and workstations. Figure B-6 illustrates the pin numbers for the NIC connector and Table B-6 defines the pin assignments for the connector.

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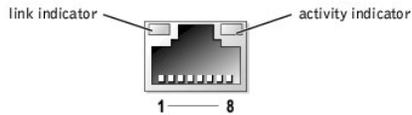
**Table B-6. NIC Connector Pin Assignments**

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

Network Cable Requirements

The NIC supports a UTP Ethernet cable equipped with a standard RJ45-compatible plug. Observe the following cabling restrictions.

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

l   Use Category 5 or greater wiring and connectors.

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

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

Abbreviations and Acronyms

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

A

ampere(s)

AC

alternating current

ANSI

American National Standards Institute

APM

advanced power management

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

EGA

enhanced graphics adapter

EIDE

enhanced integrated drive electronics

EMI

electromagnetic interference

EMM

expanded memory manager

EMS

Expanded Memory Specification

EPP

Enhanced Parallel Port

EPROM

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

ISA

Industry-Standard Architecture

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

RGB

red/green/blue

ROM

read-only memory

rpm

revolutions per minute

RTC

real-time clock

SCA

Single Controller Architecture

sec

second(s)

SDRAM

synchronous dynamic random-access memory

SIMM

single in-line memory module

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

Introduction

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

● Other Documents You May Need

Your system includes the following significant service and upgrade features:

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

The following system upgrade options are available:

l   Processor

l   Memory

l   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.

l   The *Rack Installation Guide* included with your rack solution describes how to install your system into a rack.

l   The *Setting Up Your System* document provides an overview of initially setting up your system.

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

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

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

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

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

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

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

Indicators, Messages, and Codes
Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

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

Applications, operating systems, and the system itself are capable of identifying problems and alerting you to them. When a problem occurs, a message may appear on the monitor or a beep code may sound.

A variety of messages can indicate when the system is not operating properly:

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

The system indicators and the front- and back-panel features are illustrated in this section. This section also describes each type of message and lists the possible causes and actions you can take to resolve any problems indicated by a message.

Front-Panel Indicators and Features

Figure 2-1 shows the front-panel indicators for system status and hard drive activity. The power button has a status indicator built into the button. Also, the 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 Indicators and Features
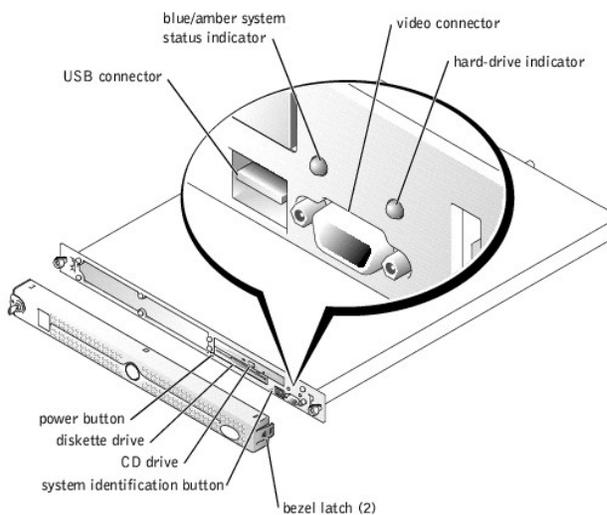
Table 2-1. Front-Panel Indicator Codes

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 controls the power input to the system's power supply.

- 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. Table 2-2 details the conditions associated with each back-panel indicator code.

Figure 2-2. Back-Panel Indicators and Features
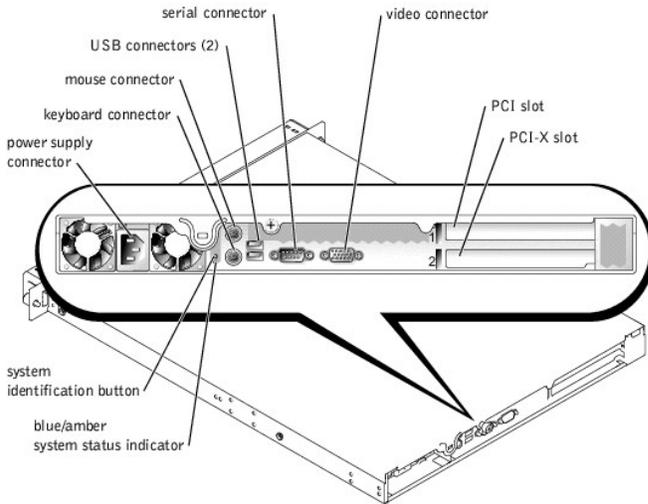
Table 2-2. Back-Panel LED Codes

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.

System Messages

System messages appear on the console during POST to notify you of a possible problem with the system. If you are performing console redirection, system messages will appear on the console. 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 program 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-drive subsystem or hard-drive subsystem.	Ensure that the diskette/CD-drive subsystem and hard drives are properly installed. If the problem persists, replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives." If the problem persists, see "Getting Help."
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 missing, faulty, or improperly installed. See Figure 5-3 to identify the fans.	Ensure that the specified fan is properly installed. If the problem persists, replace the fan. See "Fan Assemblies" 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. See Figure 5-3 to identify the fans.	Information only.
Alert! Previous voltage failure.	Power supply failed before last system startup.	Information only.
Alert! Processor thermal probe failure detected.	Microprocessor fan is missing, faulty, or improperly installed.	Ensure that the processor fan is properly installed. See Figure 5-3 for the processor fan location. If the problem persists, replace the fan. See "Fan Assemblies" in "Installing System Components."
Alert! Previous shutdown due to Processor thermal event.	Processor fan failed before the last system startup	Information only.
Alert! Unsupported memory	Unsupported or faulty memory module(s).	Ensure that all memory modules are properly installed. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components."
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-drive subsystem and hard drives are properly installed. If the problem persists, replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."
Decreasing available memory	Faulty or improperly installed memory modules.	Ensure that all memory modules are properly installed. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components."
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/CD interface cable, or loose power cable.	Replace the diskette. Ensure that the diskette/CD-drive subsystem is properly installed. If the problem persists, replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives."
Diskette read failure	Faulty or improperly inserted diskette.	Replace the diskette.
Diskette subsystem reset failed	Faulty diskette/CD-drive controller.	Ensure that the diskette/CD-drive subsystem is properly installed. If the problem persists, replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the problem persists, see "Getting Help."
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 card, or loose cable connection.	Ensure that the remote access card's cable is properly connected. Ensure that the remote access card is properly installed. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the remote access card. If the problem persists, see "Getting Help."
Embedded server management is not present	Remote access card not installed, improperly installed, or faulty.	Ensure that the remote access card is installed and installed properly. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the remote access card. If the problem persists, see "Getting Help."
Error: More than one RAC detected, system halted.	Two remote access cards are installed, or faulty or improperly installed remote access card.	Ensure that there is only one remote access card installed and that it is installed in the upper slot. Ensure that the remote access card is properly installed. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the remote access card. If the problem persists, see "Getting Help."
Error: Remote Access Card initialization failure.	Faulty or improperly installed remote access card.	Ensure that the remote access card is properly installed. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the remote access card. If the problem persists, see "Getting Help."
Error: RAC is not in the correct PCI slot, system halted.	Remote access card not installed in the proper PCI slot.	Ensure that the remote access card is installed in the upper slot.
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 remote access card.
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. If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."
	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."

`Invalid memory configuration detected. Potential corruption exists!`		
`Keyboard controller failure`	Faulty keyboard controller (faulty system board).	See "Getting Help."

`Keyboard data line failure`
 	
`Keyboard failure`
 	
`Keyboard stuck key failure`
	Loose or improperly connected keyboard cable; faulty keyboard; faulty keyboard controller.	Ensure that the keyboard is properly connected. If the problem persists, replace the keyboard. If the problem persists, see "Getting Help."

`Memory address line failure at address, read value expecting value`
 	
`Memory double word logic failure at address, read value expecting value`
 	
`Memory odd/even logic failure at start address to end address`
 	
`Memory write/read failure at address, read value expecting value`
	Faulty or improperly installed memory modules, or faulty system board.	Ensure that all memory modules are properly installed. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components." If the problem persists, see "Getting Help."

`Memory allocation error`	Faulty application program.	Restart the application program.
`Memory bank population error!`	Memory modules are not installed in decreasing size with the largest size of memory modules in bank 1; faulty memory module(s); memory modules are not installed sequentially.	Ensure that the memory modules are properly installed. Ensure that the memory modules are populated sequentially. See "Memory Module Installation Guidelines" in "Installing System Components." If the problem persists, replace the specified memory modules. See "System Memory" in "Installing System Components."
`Memory parity interrupt at address`	Faulty or improperly installed memory modules.	Ensure that all memory modules are properly installed. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components."
`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/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 **IDE CD-ROM Controller** is enabled. If 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 CD and Diskette Drives" 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`	No operating system on 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."
	Faulty diskette, diskette/CD-drive assembly, hard drive, or hard-drive	Use a bootable diskette. If the problem persists, replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the

Non-system disk or disk error	subsystem; no operating system on diskette or hard drive.	problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."
Not a boot diskette	No operating system on diskette.	Use a bootable diskette.
PCI BIOS failed to install	Loose cables to expansion card(s); faulty or improperly installed expansion card.	Ensure that all appropriate cables are securely connected to the expansion cards. If the problem persists, remove and reseat the expansion cards. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the expansion card(s).
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, remove and reseat the expansion cards. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the expansion card(s). If the problem persists, see "Getting Help."
Primary drive *n* not found	Incorrect configuration settings in System Setup program. Drive set as Auto, no disk installed.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
Read fault Requested sector not found	Faulty diskette, diskette/CD-drive assembly, hard drive, or hard-drive subsystem.	Replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."
Reset failed	Improperly connected drive interface or power cable.	Ensure that the interface cable is securely connected between the diskette/CD interposer board and the backplane board. Ensure that the interface and power cables are securely connected to the backplane board.
ROM bad checksum = *address*	Faulty or improperly installed expansion card.	Remove and reseat the expansion cards. See "Expansion Cards" in "Installing System Components." If the problem persists, replace the expansion card(s).
Secondary drive *n* not found	Incorrect configuration settings in System Setup program. Drive set as Auto, no disk installed.	Run the System Setup program to correct the settings. See "Using the System Setup Program" in your *User's Guide*.
Sector not found Seek error Seek operation failed	Faulty diskette or hard drive.	Replace the diskette. If the problem persists, replace the hard drive. See "Hard Drives" in "Installing Drives."
Shutdown failure	Shutdown test failure.	Ensure that all memory modules are properly installed. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components."
Time-of-day clock stopped	Faulty battery.	Replace the system battery. See "Replacing the Battery" in "Installing System Components."
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, replace the system battery. See "Replacing the Battery" in "Installing System Components."
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. If the problem persists, replace the memory module(s). See "Removing Memory Modules" and "Installing Memory Modules" in "Installing System Components." If the problem persists, see "Getting Help."
Unsupported CPU stepping detected	Microprocessor is not supported by the system.	Check for a BIOS update. If the problem persists, install a supported microprocessor. See "Upgrading the 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*.
	Firmware is out-of-date.	Update the firmware, see "Getting Help."

Warning! Firmware is out-of-date		
Warning! Invalid board serial number.	Corrupt NVRAM or the serial number not programmed	See "Getting Help."
Warning! No microcode update loaded for processor	New or unsupported microprocessor.	Update the BIOS firmware, see "Getting Help."
Write fault Write fault on selected drive	Faulty diskette, diskette/CD-drive assembly, hard drive, or hard-drive subsystem.	Replace the diskette. Replace the diskette/CD-drive subsystem. See "Removing the CD and Diskette Drives" in "Installing Drives." If the problem persists, replace the faulty hard drive. See "Hard Drives" in "Installing Drives."

System Beep Codes

When an error that cannot be reported on the monitor occurs during a boot routine, the system may emit a series of beeps that identify the problem.

When a beep code is emitted, record it on a copy of the Diagnostics Checklist in "Getting Help," 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 a more serious cause. If you are still unable to resolve the problem, see "Getting Help."

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

NOTE: Before you perform any procedures described in Table 2-4, see "Safety First— For You and Your System" in "Troubleshooting Your System."

Table 2-4. Server Module Beep Codes

Code	Cause	Corrective Action
1-1-2	CPU register test failure	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."
1-1-3	CMOS write/read failure; faulty server module board	Faulty system board. See "Getting Help."
1-1-4	BIOS error	Reflash the BIOS.
1-2-1	Programmable interval-timer failure; faulty server module board	Faulty system board. See "Getting Help."
1-2-2	DMA initialization failure	See "Troubleshooting System Memory" in "Troubleshooting Your System."
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	
1-3-2	No memory installed	
1-3-3	Chip or data line failure in the first 64 KB of main memory	
1-3-4	Odd/even logic failure in the first 64 KB of main memory	
1-4-1	Address line failure in the first 64 KB of main memory	
1-4-2	Parity failure in the first 64 KB of main memory	
1-4-3	Fail-safe timer test failure	
1-4-4	Software NMI port test failure	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	Faulty system board. See "Getting Help."
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-2	Interrupt vector loading failure	
3-2-4	Keyboard-controller test failure	

3-3-1	CMOS failure	
3-3-2	System configuration check failure	
3-3-3	Keyboard controller not detected	
3-3-4	Video memory test failure	
3-4-1	Screen initialization failure	
3-4-2	Screen-retrace test failure	
3-4-3	Video ROM search failure	
4-2-1	No timer tick	
4-2-2	Shutdown test failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	See "Troubleshooting an Expansion Card" 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 server module board	Faulty system board. See "Getting Help."
4-3-4	Time-of-day clock stopped	See "Troubleshooting System Memory" in "Troubleshooting Your System."
4-4-1	Super I/O chip failure; faulty server module board	Faulty system board. See "Getting Help."
4-4-4	Cache test failure; faulty microprocessor	See "Troubleshooting the Microprocessor" in "Troubleshooting Your System."

Warning Messages

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

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

Diagnostics Messages

When you run a test group or subtest in 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 (see "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. For example, the software generates messages that appear in the SNMP trap log file. Alert messages consist of information, status, warning, and failure messages for drive, temperature, fan, and power conditions. For more information, see the systems management software documentation.

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Finding Software Solutions

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

- Before You Begin
- Troubleshooting Errors and Conflicts

Software problems can be caused by:

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

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

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

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

Before You Begin

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

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

Troubleshooting Errors and Conflicts

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

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

Input Errors

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

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

Application Conflicts

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

IRQ Assignment Conflicts

Most PCI devices can share an IRQ with another device, but they cannot use an IRQ simultaneously. To avoid this type of conflict, see the documentation for each PCI device for specific IRQ requirements. Table 3-1 lists the IRQ assignment defaults.

Table 3-1. IRQ Assignment Defaults

IRQ Line	Assignment
IRQ0	System timer
IRQ1	Keyboard controller
IRQ2	Interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	Remote access controller serial port (when applicable)
IRQ4	Serial port 1 (COM1 and COM3)
IRQ5	Remote access controller
IRQ6	Diskette-drive controller
IRQ7	Parallel port
IRQ8	Real-time clock
IRQ9	ACPI functions (used for power management)
IRQ10	*Available*
IRQ11	*Available*
IRQ12	PS/2 mouse port unless the mouse is disabled through the System Setup program
IRQ13	Math coprocessor
IRQ14	IDE CD-drive controller
IRQ15	*Available*

Running the System Diagnostics
Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

- Using Server Administrator Diagnostics
- System Diagnostics Features
- When to Use the System Diagnostics
- Running the System Diagnostics
- System Diagnostics Testing Options
- Using the Advanced Testing Options
- Error Messages

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

Using Server Administrator Diagnostics

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

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

System Diagnostics Features

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

- Run tests individually or collectively.

- Control the sequence of tests.

- Repeat tests.

- Display, print, or save test results.

- Temporarily suspend testing if an error is detected or terminate testing when a user-defined error limit is reached.

- View help messages that briefly describe each test and its parameters.

- View status messages that inform you if tests are completed successfully.

- View error messages that inform you of problems encountered during testing.

When to Use the System Diagnostics

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

Running the System Diagnostics

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

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

l The left side of the screen under **Device Groups** lists the diagnostic device groups in the order that they are tested if you select **All** under the **Run Tests** submenu. Press the up- or down-arrow keys to highlight a particular device group. Press the left- or right-arrow keys to select the options on the menu. As you move from one menu option to another, a brief explanation of the highlighted option appears at the bottom of the screen.

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

l   The menu area consists of two lines at the bottom of the screen. The first line lists the menu options that you can select; press the left- or right-arrow key to highlight an option. The second line provides information about the highlighted option.

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

Error Messages

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

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Troubleshooting Your System

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

If your system is not working as expected, begin troubleshooting using the procedures in this section. This section guides you through initial checks and procedures that can solve basic system problems and provides troubleshooting procedures for components inside the system. Before you start any of the procedures in this section, perform the following steps:

⚠ Read "Safety Instructions" in your *System Information Guide*.

ı Read "Running the System Diagnostics" for information about running diagnostics.

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.

⚠ 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 2-2 for the back-panel connectors on your system. See "I/O Connectors" for more information about the functionality of each connector type.

Checking Specific System Problems

1. Turn off the system and attached peripherals. Disconnect all the power cables from their electrical outlets.

2. If the system is connected to a power distribution unit (PDU), turn the PDU off and then on again.

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

3. Reconnect the system to the electrical outlet or PDU.

Start-up Routine

It is important to look and listen to your system when trying to determine the source of a problem. 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, Messages, and Codes."
A series of beeps emitted by the system	See "System Beep Codes" in "Indicators, Messages, and Codes."
Alert messages from the Dell OpenManage™ Server Administrator software	See your systems management software documentation.
The monitor's power indicator	See "Troubleshooting the Video Subsystem."
The keyboard indicators	See "Troubleshooting the Keyboard."
The diskette-drive activity indicator	See "Troubleshooting a Diskette Drive."
The CD drive activity indicator	See "Troubleshooting a CD Drive."
The hard-drive activity indicators	See "Troubleshooting IDE Hard Drives."
An unfamiliar constant scraping or grinding sound when you access a drive	See "Getting Help."

Opening the System

The system is enclosed by a 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 5-1.

   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 5-1. Removing the Bezel
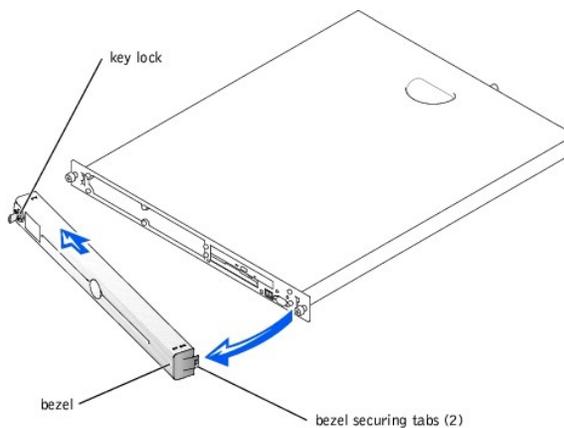
2. Observe the precautions in "Safety First—For You and Your System."

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

4. To remove the system cover, loosen the thumbscrew at the back of the system. See Figure 5-2.

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 5-2. Removing and Replacing the System Cover
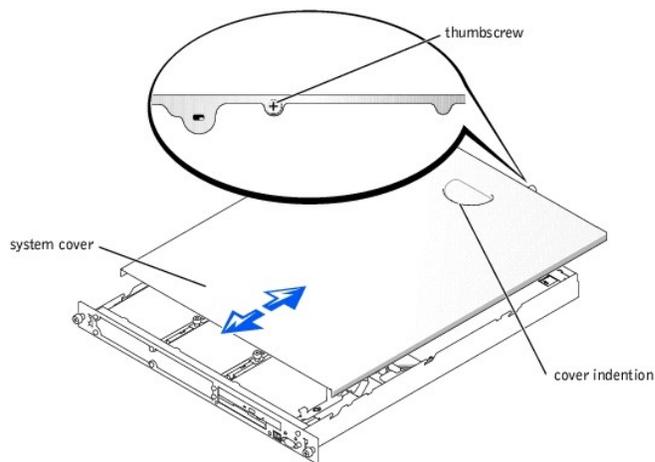
Closing the System

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 5-2.

3. Tighten the thumbscrew at the back of the system to secure the cover.

4. To replace the bezel. See Figure 5-1.

    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.

Checking the Equipment

This section provides troubleshooting procedures for components that connect directly to the I/O panel of the system. Before performing any of these procedures, see "External Connections."

Troubleshooting the Video Subsystem

Problem

- l Monitor
- l Monitor interface cable
- l Video memory
- l Video logic

Action

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

2. Determine whether the system has a remote access card and a video expansion card installed.

The system supports only the embedded video when using a remote access card.

If a video expansion card is not installed, go to step 3.

If a video expansion card is installed, remove the video card. See "Removing an Expansion Card" in "Installing System Components." If the problem persists, go to step 3.

3. Run the video tests in the system diagnostics.

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

If the tests did not run successfully, see "Getting Help."

Troubleshooting the Keyboard

Problem

l System message indicates a problem with the keyboard.

l Keyboard cable.

Action

1. Press each key on the keyboard, and look at the keyboard and its cable for any signs of damage.

If the keyboard appears to be free of physical damage, go to step 3.

If the keyboard is damaged, continue to step 2.

2. Swap the faulty keyboard with a working keyboard.

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

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

If the test fails, see "Getting Help."

Troubleshooting the Mouse

Problem

l System message indicates a problem with the mouse.

l Mouse cable.

Action

1. Click each button on the mouse, and look at the mouse and its cable for any signs of damage.

If the mouse appears to be free of physical damage, go to step 3.

If the mouse is damaged, continue to step 2.

2. Swap the faulty mouse with a working mouse.

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

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

If the problem is not resolved, continue to step 4.

4. 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

l Error message indicates a problem with a serial port.

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

Action

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

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

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

If the tests run successfully but the problem persists, see "Troubleshooting a Serial I/O Device."

Troubleshooting a Serial I/O Device

Problem

l Device connected to the serial port is not working.

Action

1. Remove the bezel. See "Opening the System."

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

3. Swap the interface cable with a known working cable.

4. Turn on the system and the serial device.

If the problem is resolved, the interface cable must be replaced. See "Getting Help."

5. Turn off power to the system and the serial device, and swap the device with a comparable device.

6. Turn on the system and the serial device.

If the problem is resolved, the serial device must be replaced.

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

Troubleshooting a USB Device

Problem

    l   System error message indicates a problem.

    l   Device connected to the port is not working.

Action

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

2. Remove the bezel. See "Opening the System."

3. Turn off the system and any USB devices.

    If only one USB device is connected to the system, go to step 6.

4. Disconnect all USB devices, and connect the malfunctioning device to the other USB port.

5. Turn on the system and the reconnected device.

    If the problem is resolved, the USB port may be defective. See "Getting Help."

6. If possible, swap the interface cable with a known working cable.

    If the problem is resolved, the interface cable must be replaced. See "Getting Help."

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

8. Turn on the system and the USB device.

    If the problem is resolved, the USB device must be replaced.

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

Inside the System

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

Figure 5-3. Inside the System
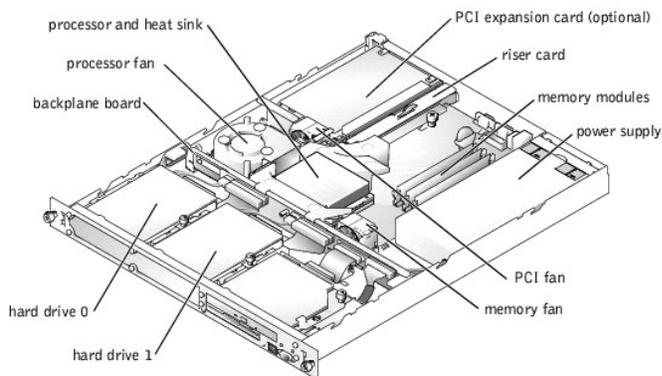
The system board holds the system's control circuitry and other electronic components. Several hardware options such as the processors and memory are installed directly on the system board. Using a riser card, the system can accommodate up to two expansion cards. The upper slot supports PCI 64-bit, 33-MHz

expansion cards and the lower slot supports PCI-X 64-bit, 133-MHz expansion cards.

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

Troubleshooting a Wet System

Problem

l   Liquid spills

l   Splashes

l   Excessive humidity

Action

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

2.   Remove any expansion cards, if installed. See "Removing an Expansion Card" in "Installing System Components."

3.   Allow the system to dry thoroughly for at least 24 hours.

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

5.   Remove the bezel. See "Opening the System."

6.   Turn on the system.

7.   If the system starts up normally, shut down the system and reinstall the expansion cards you removed in step 2.

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

9.   Run the system board tests in the system diagnostics to confirm that the system works properly. See "Running the System Diagnostics."

If the tests did not complete successfully, see "Getting Help."

Troubleshooting a Damaged System

Problem

l   System dropped or damaged.

Action

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

2.   Check the following connections:

l   Riser-card connections to the system board

l   Drive-carrier connections to the backplane board

3.   Ensure that all cables are properly connected and all component connectors are properly seated.

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 did not complete successfully, see "Getting Help."

Troubleshooting the System Battery

Problem

- l Error message shows problem with the battery.

- l System Setup utility loses the system configuration information.

- l System date and time do not stay current.

Action

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

2. Check the connection of the battery to the system board.

   See "Replacing the Battery" in "Installing System Components."

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

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

4. If the problem is not resolved by reseating the battery, replace the battery. See "Replacing the Battery" in "Installing System Components."

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

Troubleshooting the Power Supply

Problem

- l 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 the Cooling Fans

Problem

- l One or more of the system fans does not work.

Action

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

2. Lift the fan from the chassis. See "Removing a Fan Assembly" in "Installing System Components."

3. Reseat the fan.

   Ensure that the fan connector is firmly seated.

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

   If the problem persists, replace the fan.

5. If the replacement fan does not operate, one of the fan connectors is faulty. See "Getting Help."

Troubleshooting an Expansion Card

Problem

   ı Expansion card does not perform as expected.

Action

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

2. Verify that the expansion card is firmly seated in its connector and the riser card is firmly seated in the riser-card connector.

3. Verify that the appropriate cables are firmly connected to the expansion-card connector.

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

   If the problem persists, continue to the next step.

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

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

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

8. Run the **Quick Tests** in the system diagnostics. See "Running the System Diagnostics."

   If the tests do not complete successfully, see "Getting Help."

   If the tests run successfully, continue to the next step.

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

10. Reinstall one of the expansion cards.

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

12. Remove the bezel (see "Opening the System"), turn on the system, and repeat step 8.

   If the tests still fail, see "Getting Help."

   If the tests are successful, continue to the next step.

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

14. Reinstall the other expansion card.

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

16. Remove the bezel (see "Opening the System"), turn on the system, and repeat step 8.

   If the tests fail, the expansion card might be faulty. See "Getting Help."

If the tests are successful, the expansion cards may not have been properly installed.

Troubleshooting the Microprocessor

Problem

l Error message indicates a microprocessor problem.

l 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 Components."

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

5. Run **Quick Tests** in the system diagnostics. See "Running the System Diagnostics."

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

Troubleshooting System Memory

Problem

l Faulty memory module

l Faulty system board

Action

1. Remove the bezel. See "Opening the System."

2. Turn on the system and attached peripherals.

If no error messages occur during POST, go to step 13.

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

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

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

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

If no error messages occur during POST, go to step 13.

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

7. Remove all the memory modules. See "Removing Memory Modules" in "Installing System Components."

8. Install a known working memory module in DIMM A. See "Installing Memory Modules" in "Installing System Components."

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

If no error messages occur during POST, continue to the next step.

If there are error messages, the system board might be faulty. See "Getting Help."

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

11. Remove the memory module from DIMM A and reinstall one of the memory modules that you removed in step 7.

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

If no error messages occur during POST, reinstall one of the memory modules that you removed in step 7 and repeat this step for the remaining memory module.

If there are error messages, the memory module is faulty. Replace the memory module. See "System Memory."

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

If the test does not complete successfully, see "Getting Help."

Troubleshooting the System Board

Problem

ı 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.

Troubleshooting a Diskette Drive

Problem

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

3. Run the diskette drive tests to see 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.**

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

5. Ensure that the CD/diskette drive interface cable is securely connected to the interposer board and the backplane board.

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

7. Run the diskette drive tests to see whether the diskette drive works correctly.

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

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

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

11. 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."

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

13. Reinstall one of the expansion cards you removed in step 9. See "Installing an Expansion Card" in "Installing System Components."

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

15. Run the diskette drive tests to see whether the diskette drive works correctly.

16. Repeat step 12 through step 15 until all expansion cards are reinstalled, one of the expansion cards causes the tests to fail, or the system cannot boot from a diskette.

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

Troubleshooting a CD Drive

Problem

- ꟼ System cannot read data from a CD in an IDE drive.

- ꟼ 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 IDE or SCSI controller is enabled. See "Using the System Setup Program" in the *User's Guide*.

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

4. Run the IDE devices tests in the system diagnostics to determine whether the drive works correctly. See "Running the System Diagnostics."

   If the tests failed, 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 CD/diskette-drive interface cable is securely connected to the interposer board and to the backplane board.

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

8. 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 IDE Hard Drives

Problem

- l   Faulty hard drive
- l   Faulty backplane board
- l   Faulty or loose cable connections

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 the files on the hard drive.

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

2. Run the hard drive and IDE devices tests in the system diagnostics to determine whether the hard drive operates properly. See "Running the System Diagnostics."

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

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

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

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

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

8. Partition and logically format the hard drive. See the operating system documentation.

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

If the problem persists, see "Getting Help."

Troubleshooting SCSI Hard Drives

Problem

- l   Faulty hard drive
- l   Faulty or loose cable connections to a controller card

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 the files on the hard drive.

1. 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 controller's documentation.

If the tests fail, continue to step 2.

2. Reboot the system and enter the SCSI configuration utility.

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 on the configuration utility.

3. Ensure that the primary SCSI channel is enabled, and restart the system. See the documentation for your SCSI controller.

4. Ensure that any required device drivers are installed and are configured correctly.

For information on installing device drivers, see the *Dell OpenManage Server Assistant* CD and the documentation that accompanied the controller card.

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

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

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

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

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

See the documentation for the hard drive for instructions on configuring the SCSI ID and enabling or disabling termination.

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

If the problem persists, continue to step 11.

11. Partition and logically format the hard drive. See the operating system documentation.

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

If the problem persists, see "Getting Help."

Back to Contents Page

Installing System Components

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

- System Board Components
- Fan Assemblies
- Expansion Cards
- System Memory
- Upgrading the Processor
- System Battery
- Power Supply

This section describes how to install the following system components:

l Fan assemblies

l Expansion cards

l Memory upgrades

l Processor upgrades

l System battery

l Power supply

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
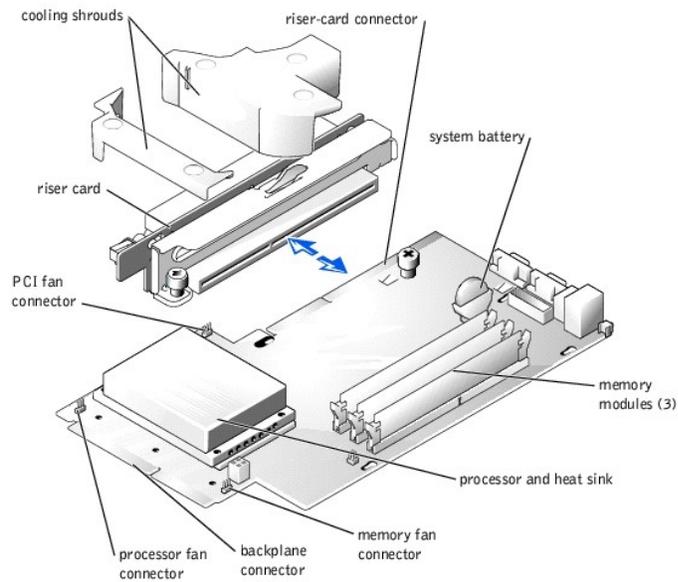
Fan Assemblies

Your system contains three fan assemblies. The three assemblies provide cooling for the processor, memory modules, and expansion cards.

Removing a 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. Lift the fan assemblies out of the chassis carefully, making sure that the connector disconnects from the system board. See Figure 6-2, Figure 6-3, and Figure 6-4 for the locations of the fan assemblies.

   If you are removing the processor fan assembly, remove the two cooling shrouds before removing the fan assembly. See Figure 6-1 for the location of the cooling shrouds.

Figure 6-2. Removing the Processor Fan Assembly
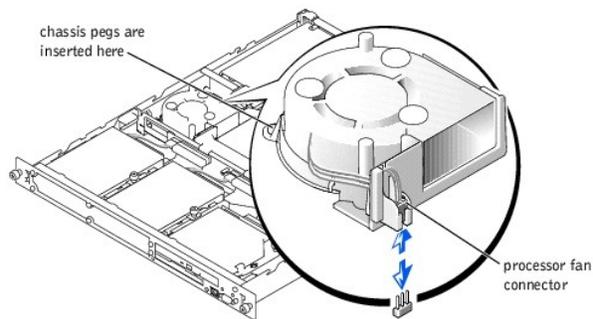
**Figure 6-3. Removing the Memory Fan Assembly**
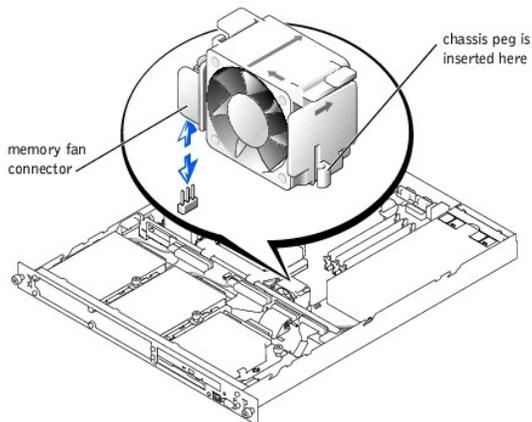
Figure 6-4. Removing the PCI Fan Assembly

chassis peg is
inserted here

PCI fan
connector
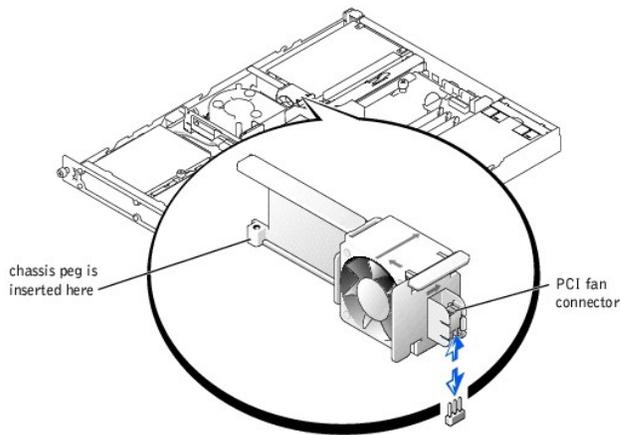
Installing a Fan Assembly

1. Align the replacement fan assembly's connector with the connector on the system board and the pegs on the chassis. See Figure 6-2, Figure 6-3, and Figure 6-4 for the locations of the fan assemblies.

2. Push down on the fan assembly until it is properly seated on the chassis pegs and to the three-pin connector on the system board.

   If you are installing the processor fan assembly, install the two cooling shrouds after installing the processor fan assembly. See Figure 6-1 for the location of the cooling shrouds.

3. 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 64-bit, 33-MHz cards and the lower slot supports 64-bit, 133-MHz cards. See Figure A-5. 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

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

2. Remove the expansion-card retainer adjacent to the PCI slots.

3. Remove the filler bracket on the slot you will be using.

   ![NOTE icon] **NOTE:** Keep this bracket in the event 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 card from the system board.

   If you are installing a SCSI or RAID controller card, route the interface cable through the openings in the backplane bracket and the PCI fan bracket before connecting the cable to the controller card. After routing the interface cable, ensure that the cable is securely connected to the controller card and the hard drives.

   ![NOTE icon] **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 6-5.

6. Connect any external cable(s) to the expansion card.

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

Figure 6-5. Installing an Expansion Card

expansion-card
retainer

PCI slot 1

PCI slot 2

expansion card

expansion-card
connector (on riser board)
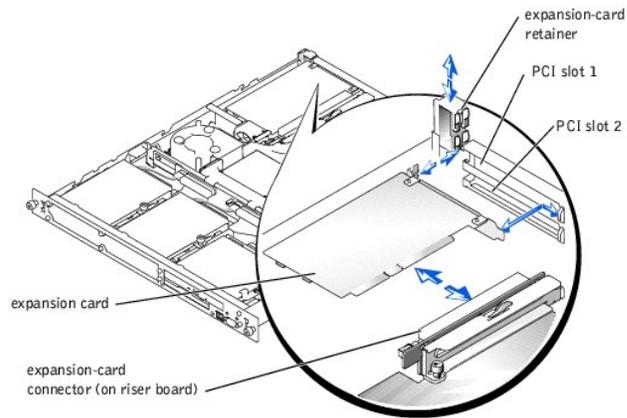
Removing an Expansion Card

⚠️ **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 external cable(s) that are connected to the expansion card.

3. Remove the expansion-card retainer adjacent to the PCI slots. See Figure 6-5.

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."

System Memory

The three memory module sockets are located on the system board adjacent to the power supply. See Figure 6-1.

You can upgrade the system memory by installing combinations of registered 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-2100 compliant.

Memory Module Installation Guidelines

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

- Install the memory modules with the largest capacity in DIMM A and the least capacity in DIMM C.

- Install the memory modules sequentially, which means that there can be no empty memory module sockets between the first and last installed socket.

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 6-6, 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.

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 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 6-6. Installing and Removing a Memory Module
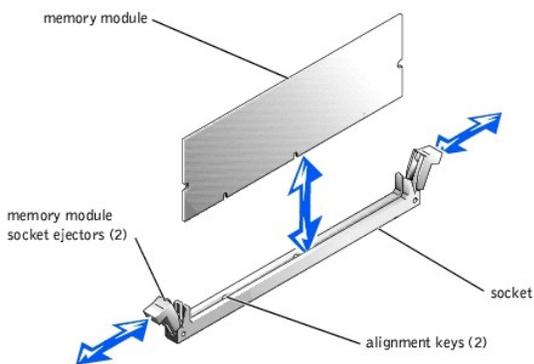
Removing Memory Modules

⚠️ **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 6-6.

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

Upgrading the Processor

It is possible to upgrade your processor to take advantage of future options in speed and functionality. Each processor and its associated level 2 (L2) 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:

l   Processor

l   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 both pieces of the cooling shroud.

3.   Pushing down with one hand on the securing clip's rubber-coated tab, use the other hand to pull the latch on the securing clip on the left to release the securing clip from the heat-sink posts. See Figure 6-7.

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 securing clip on the right.

Figure 6-7. Removing the Securing Clip
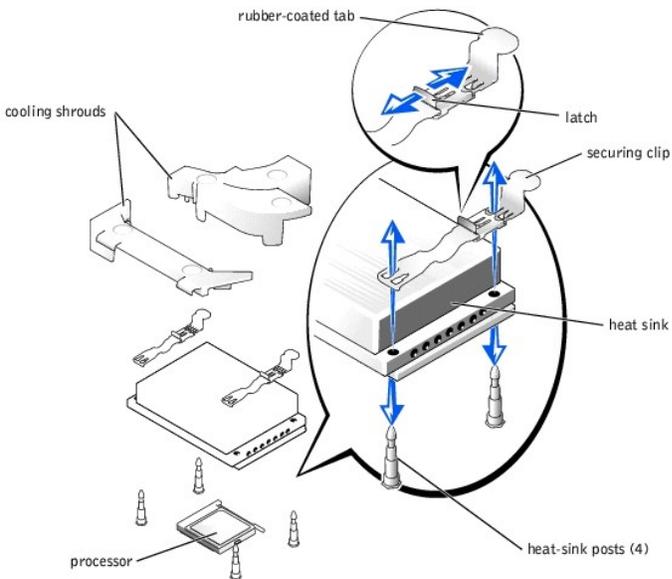
6.   Remove the heat sink.

     If the heat sink uses a foil thermal interface material, set the heat sink upside down so as not to contaminate the interface material.

7.   Pull the socket-release lever straight up until the processor is released from the socket. See Figure 6-8.

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 6-8.

   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 6-8. Installing the Processor in the Socket
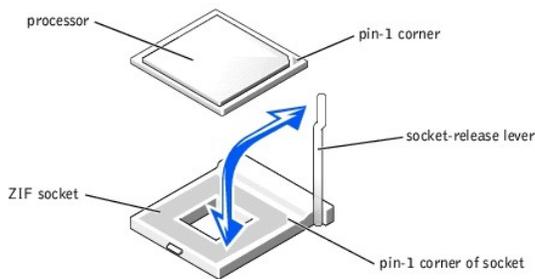
NOTICE: Positioning the processor incorrectly can permanently damage the processor and the system when you turn it on. When placing the processor in the socket, be sure that all of the pins on the processor enter the corresponding holes. Be careful not to bend the pins.

   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.

   l If the new heat sink uses a foil thermal interface material strip, align the holes on both sides of the heat sink with the heat-sink posts on the system chassis.

   l If the new heat sink has a thermal grease tab, remove the tab and then align the holes on both sides of the heat sink with the heat-sink posts on the system chassis.

13. Orient the securing clips as shown in Figure 6-7.

14. Position each securing clip over the heat-sink posts, then snap them onto the posts.

15. While holding down the rubber-coated tab with one hand, push the latch on the securing clip on the right until it locks the clip onto the post. Repeat this step for the securing clip on the left.

16. Replace the cooling shrouds.

17. 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.

18. 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.

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

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

System Battery

The system battery maintains your system's configuration, date, and time information in a special section of memory when you turn off the system. The operating life of the battery ranges from 2 to 5 years, depending on how you use the system (for example, if you keep the system turned on most of the time, the battery gets little use, and therefore lasts longer).

You might need to replace the battery if an incorrect time or date displays during the boot routine along with a message about the wrong time, invalid configuration information, or bad CMOS checksum.

To determine if the battery needs replacing:

1. Re-enter the time and date through the System Setup program. For more information about using the System Setup program, see your *User's Guide*.

2. Remove the bezel, if applicable. See "<u>Opening the System</u>" in "Troubleshooting Your System."

3. Turn off the system and disconnect it from electrical power for a few hours.

4. After several hours, reconnect the system to a power source and turn it back on.

5. Enter the System Setup program.

   If the date and time are not correct in the System Setup program, replace the battery.

✍ **NOTE:** Some software might 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.

✍ **NOTE:** If the system is turned off for long periods of time (for weeks or months), the SDRAM may lose its system configuration information. This loss is *not* caused by a defective battery.

You can operate the system without a battery; however, the system configuration information maintained by the battery in SDRAM is erased each time you shut down the system. Therefore, you must re-enter the system configuration information and reset the options each time the system boots until you replace the battery. The battery is a 3.0-volt (V) battery.

Replacing the 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 "<u>Opening the System</u>" in Troubleshooting Your System."

3. Locate the battery on the system board. See <u>Figure A-3</u> for the battery location.

4. Grasp the battery with your fingers and pull up to remove the battery from the battery socket.

5. Place the new battery with the side labeled "+" facing toward the open side of the battery socket. See <u>Figure 6-9</u>.

Figure 6-9. Replacing the Battery

battery

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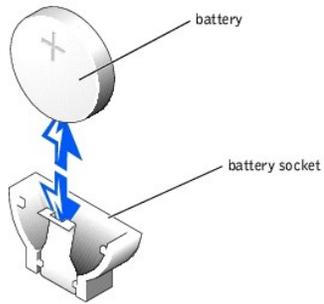
6. Close the system. See "Closing the System" in "Troubleshooting Your System."

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

8. 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.

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

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

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

Power Supply

The system supports a single 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 power supply's cable from the backplane board.

3. Remove the power-supply retaining bracket that secures the power supply inside the system. See Figure 6-10.

4. Slide the power supply backward and lift straight up to remove the power supply from the chassis.

Figure 6-10. Replacing the Power Supply

securing tabs

power supply

connector to backplane board

power-supply retaining bracket

securing brackets (2)
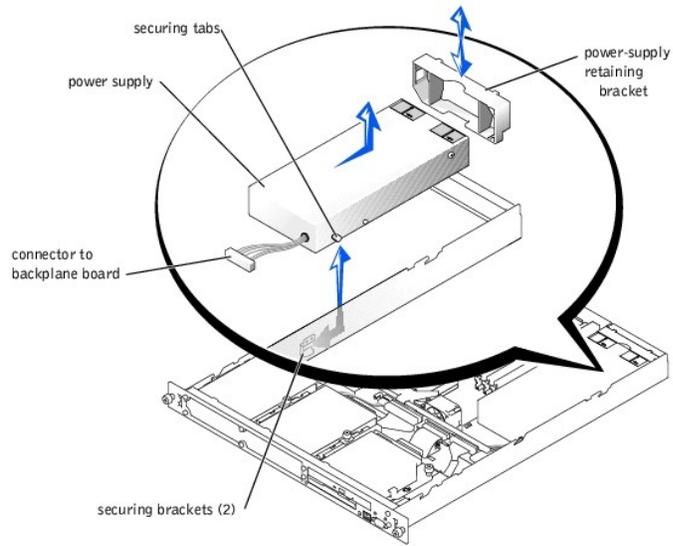
Installing the Power Supply

1. Lower the power supply into the chassis and slide it forward until the securing tabs on the power supply are engaged into the securing brackets.

2. Connect the power-supply cable to the backplane.

3. Replace the power-supply retaining bracket.

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

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Installing Drives

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

- ● SCSI Configuration Information
- ● Configuring the Boot Drive
- ● Hard Drives
- ● Installing a RAID or SCSI Controller Card
- ● CD/Diskette Drives

The hard drive bays provide space for up to two IDE or SCSI hard drives and a CD/diskette drive combination. The IDE hard drives connect to the backplane board and the SCSI hard drives must be connected to a controller card. The cables that connect to the controller card are routed through openings in the backplane bracket and the PCI fan bracket.

SCSI Configuration Information

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

SCSI Interface Cables

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

SCSI ID Numbers

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

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

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

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

Device Termination

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

Configuring the Boot Drive

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

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

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

l   To boot from an IDE or 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 IDE or SCSI hard drives. If your system contains SCSI hard drives, they must be connected to a SCSI controller board. The cables for the SCSI hard drives are routed through openings in the backplane bracket and the PCI fan bracket, to the controller.

The procedures for removing and installing IDE 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. Disconnect the power and interface cables from the hard drive.

    The interface cables for IDE hard drives are connected to the backplane board.

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

3. Loosen the thumbscrew that secures the hard-drive carrier to the chassis. See Figure 7-1.

Figure 7-1. Removing and Installing a Hard Drive
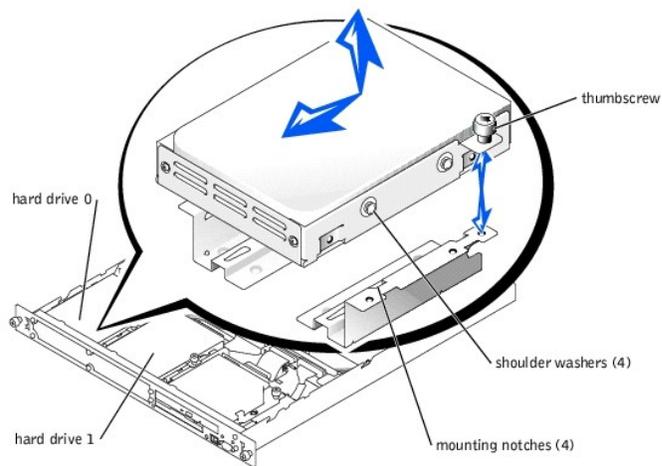
4. Slide the hard-drive carrier backward and lift the carrier out of the chassis.

5. 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 7-2.

Figure 7-2. Removing the Hard Drive From the Drive Carrier
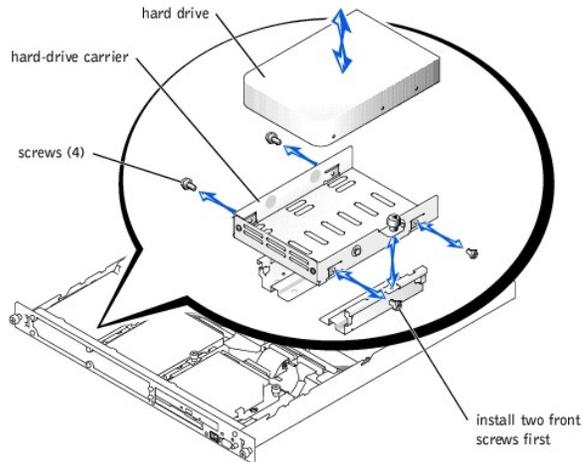
Installing a Hard Drive

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 7-2.

   ![NOTE] **NOTE:** Install the two screws at the front of the hard-drive carrier first.

3. Align the hard-drive carrier so that the shoulder washers on the carrier slide into the mounting notches in the chassis.

4. Slide the carrier forward until it stops.

5. Tighten the thumbscrew that secures the hard-drive carrier to the chassis.

6. Connect the power and interface cables to the new drive.

   The interface cables for IDE hard drives are connected to the backplane board.

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

7. 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 and routing the cables.

CD/Diskette Drives

The CD/diskette drives are mounted on a tray that is secured to the chassis using a thumbscrew. The drives are connected using and interposer card, which connects to the backplane board.

Removing the CD/Diskette Drive Tray

⚠ **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 CD/diskette drive's interposer card.

3. Loosen the thumbscrew that secures the CD/diskette drive tray to the chassis. See Figure 7-3.

4. Slide the tray backward and lift it out of the chassis.

Figure 7-3. Removing the CD/Diskette Drive Tray
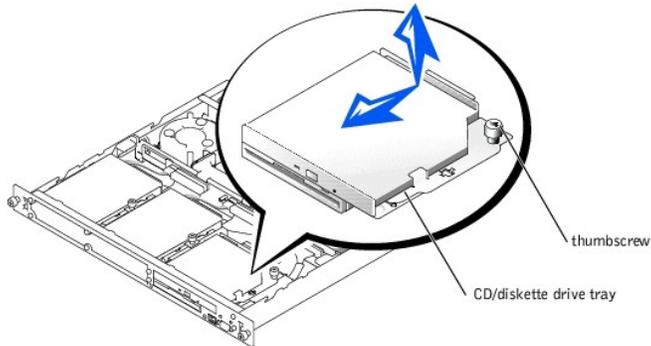
Installing the CD/Diskette Drive Tray

1. Align the drive tray so that the shoulder washers on the tray slide into the mounting notches in the chassis.

2. Slide the tray forward until it stops.

3. Tighten the thumbscrew that secures the drive tray to the chassis.

4. Connect the interface cable to the CD/diskette drive's interposer card.

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

Removing the CD and Diskette Drives

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

1. Remove the CD/diskette-drive tray. See "Removing the CD/Diskette Drive Tray."

2. Remove the two fasteners that secure the interposer card to the drive tray. See Figure 7-4.

   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 backplane board, grasp the plunger head and pull the plunger completely out of the drive tray.

3. Disconnect the interposer card from the CD drive.

4. While squeezing the tabs on the drive tray securing lever, rotate the lever all the way open. See Figure 7-4.

5. Remove the CD and diskette drives from the drive tray.

If you are replacing the diskette drive, disconnect the interface cable from the diskette drive that connects to the interposer card.

Figure 7-4. Removing the CD and Diskette Drives
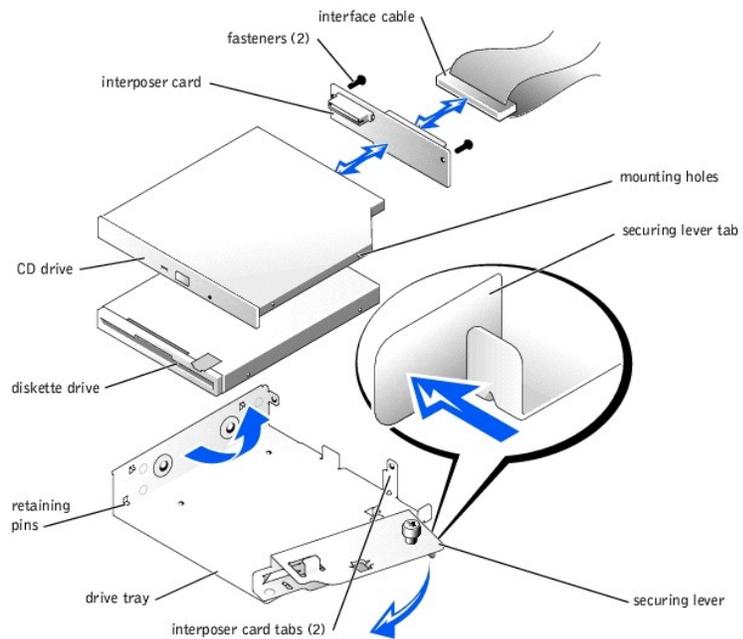
Installing the CD and Diskette Drives

1. Align the diskette drive's mounting holes with the retaining pins on the drive tray. See Figure 7-4.

   If the diskette drive is replaced, connect the interface cable from the interposer card to the new diskette drive.

2. Align the CD drive's mounting holes with the retaining pins on the drive tray. See Figure 7-4.

3. Rotate the drive tray's securing lever until it snaps into place.

4. Connect the interposer card to the CD drive.

   Ensure that the fastener barrels are inserted through the interposer card and the tabs on the drive tray.

5. Insert the plungers into the fastener barrels until they snap into place.

6. Install the CD/diskette-drive tray. See "Installing the CD/Diskette Drive Tray."

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Getting Help

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

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

Technical Assistance

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

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

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

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

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

   For more information, see "Online Services."

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

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

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

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

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

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

Online Services

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

You can contact Dell electronically using the following addresses:

- World Wide Web

  www.dell.com/

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

  www.euro.dell.com (for Europe only)

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

l Anonymous file transfer protocol (FTP)

ftp.dell.com/

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

l Electronic Support Service

support@us.dell.com

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

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

l Electronic Quote Service

sales@dell.com

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

l Electronic Information Service

info@dell.com

AutoTech Service

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

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

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

Automated Order-Status Service

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

Technical Support Service

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

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

Dell Enterprise Training and Certification

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

Problems With Your Order

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

Product Information

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

Returning Items for Warranty Repair or Credit

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

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

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

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

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

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

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

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

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

Before You Call

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

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

CAUTION: Before servicing any components inside your computer, see your *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:

l   **www.dell.com**

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

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

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

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

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

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Anguilla	General Support	toll-**free: 800**-335-0031
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires)	Website: **www.dell.com.ar**	
International Access Code: **00**	Tech Support and Customer Care	toll-**free: 0**-800-444-0733
	Sales	0-810-444-3355
Country Code: **54**	Tech Support Fax	11 4515 7139
City Code: **11**	Customer Care Fax	11 4515 7138
Aruba	General Support	toll-**free: 800**-1578
Australia (Sydney)	E-mail (Australia): au_tech_support@dell.com	
	E-mail (New Zealand): nz_tech_support@dell.com	
International Access Code: **0011**	Home and Small Business	1-300-65-55-33
	Government and Business	toll-**free: 1**-800-633-559
Country Code: **61**	Preferred Accounts Division (PAD)	toll-**free: 1**-800-060-889
City Code: **2**	Customer Care	toll-**free: 1**-800-819-339

	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	01 795 67602
	Home/Small Business Fax	01 795 67605
	Home/Small Business Customer Care	01 795 67603
	Preferred Accounts/Corporate Customer Care	0660 8056
	Home/Small Business Technical Support	01 795 67604
	Preferred Accounts/Corporate Technical Support	0660 8779
	Switchboard	01 491 04 0
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
	Home/Small Business Sales	toll-free: 0800 16884
	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**	Automated Order-Status System	toll-free: 1-800-433-9014
	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	Customer Care (from outside Toronto)	toll-free: 1-800-326-9463
	Customer Care (from within Toronto)	416 758-2400
	Customer Technical Support	toll-free: 1-800-847-4096
	Sales (direct sales—from outside Toronto)	toll-free: 1-800-387-5752
	Sales (direct sales—from within Toronto)	416 758-2200
	Sales (federal government, education, and medical)	toll-free: 1-800-567-7542
	Sales (major accounts)	toll-free: 1-800-387-5755
	TechFax	toll-free: 1-800-950-1329
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 2062
	Large Corporate Accounts GCP	toll-free: 800 858 2055

	Large Corporate Accounts Key Accounts	toll-**free: 800 858 2628**
	Large Corporate Accounts North	toll-**free: 800 858 2999**
	Large Corporate Accounts North Government and Education	toll-**free: 800 858 2955**
	Large Corporate Accounts East	toll-**free: 800 858 2020**
	Large Corporate Accounts East Government and Education	toll-**free: 800 858 2669**
	Large Corporate Accounts Queue Team	toll-**free: 800 858 2572**
	Large Corporate Accounts South	toll-**free: 800 858 2355**
	Large Corporate Accounts West	toll-**free: 800 858 2811**
	Large Corporate Accounts Spare Parts	toll-**free: 800 858 2621**
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: **00** Country Code: **420** City Code: **2**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	02 22 83 27 27
	Customer Care	02 22 83 27 11
	Fax	02 22 83 27 14
	TechFax	02 22 83 27 28
	Switchboard	02 22 83 27 11
Denmark (Copenhagen) International Access Code: **00** Country Code: **45**	Website: **support.euro.dell.com**	
	E-mail Support (portable computers): den_nbk_support@dell.com	
	E-mail Support (desktop computers): den_support@dell.com	
	E-mail Support (servers): Nordic_server_support@dell.com	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	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) International Access Code: **990** Country Code: **358** City Code: **9**	Website: **support.euro.dell.com**	
	E-mail: fin_support@dell.com	
	E-mail Support (servers): Nordic_support@dell.com	
	Technical Support	09 253 313 60
	Technical Support Fax	09 253 313 81
	Relational Customer Care	09 253 313 38
	Home/Small Business Customer Care	09 693 791 94
	Fax	09 253 313 99
	Switchboard	09 253 313 00
France (Paris) (Montpellier) International Access Code: **00** Country Code: **33** City Codes: **(1) (4)**	Website: **support.euro.dell.com**	
	E-mail: **support.euro.dell.com/fr/fr/emaildell/**	
	Home and Small Business	
	Technical Support	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Langen)	Website: **support.euro.dell.com**	

	E-mail: tech_support_central_europe@dell.com	
International Access Code: **00**	Technical Support	06103 766-7200
Country Code: **49**	Home/Small Business Customer Care	0180-5-224400
City Code: **6103**	Global Segment Customer Care	06103 766-9570
	Preferred Accounts Customer Care	06103 766-9420
	Large Accounts Customer Care	06103 766-9560
	Public Accounts Customer Care	06103 766-9555
	Switchboard	06103 766-7000
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	Technical Support (Dimension™ and Inspiron™)	296 93188
International Access Code: **001**	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	296 93191
Country Code: **852**	Customer Service (non-technical, post-sales issues)	800 93 8291
	Transaction Sales	toll-**free:** 800 96 4109
	Large Corporate Accounts HK	toll-**free:** 800 96 4108
	Large Corporate Accounts GCP HK	toll-**free:** 800 90 3708
India	Technical Support	1600 33 8045
	Sales	1600 33 8044
Ireland (Cherrywood)	Website: **support.euro.dell.com**	
International Access Code: **16**	E-mail: dell_direct_support@dell.com	
	Ireland Technical Support	1850 543 543
Country Code: **353**	U.K. Technical Support (dial within U.K. only)	0870 908 0800
City Code: **1**	Home User Customer Care	01 204 4095
	Small Business Customer Care	01 204 4444
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	01 204 4003
	Ireland Sales	01 204 4444
	U.K. Sales (dial within U.K. only)	0870 907 4000
	SalesFax	01 204 0144
	Fax	01 204 5960
	Switchboard	01 204 4444
Italy (Milan)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: **support.euro.dell.com/it/it/emaildell/**	
	Home and Small Business	
Country Code: **39**	Technical Support	02 577 826 90
City Code: **02**	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	General Support (dial from within Jamaica only)	1-800-682-3639
Japan (Kawasaki)	Website: **support.jp.dell.com**	
International Access Code: **001**	Technical Support (servers)	toll-free: 0120-1984-98
	Technical Support outside of Japan (servers)	81-44-556-4162
Country Code: **81**	Technical Support (Dimension™ and Inspiron™)	toll-free: 0120-1982-26
City Code: **44**	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)	toll-free: 0120-1984-33
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	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
	Faxbox Service	044-556-3490
	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)	02 481 92 88
	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: **support.euro.dell.com/nl/nl/emaildell/**	
	Technical Support	020 674 45 00
	Home/Small and Medium Business	020 674 55 00
	Home/Small and Medium Business Fax	020 674 47 75
	Home/Small and Medium Business Customer Care	020 674 42 00
	Corporate	020 674 50 00
	Corporate Fax	020 674 47 79
	Corporate Customer Care	020 674 43 25
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@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: **35**	E-mail: **support.euro.dell.com/es/es/emaildell/**	
	Technical Support	800 834 077
	Customer Care	800 300 415 or 800 834 075
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 121 422 07 10
	Fax	121 424 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 or 0800 33 556
	Corporate Sales	toll-**free**: 0080 651 227 or 0800 33 555
Thailand International Access Code: **001** Country Code: **66**	Technical Support	toll-**free**: 0880 060 07
	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: **dell.co.uk/lca/customerservices**	
	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 373 185 or 01344 373 186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	0870 908 0500
	Preferred Accounts (500–5000 employees) Customer Care	01344 373 196
	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
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)
	Software Application Support	toll-free: 1-800-433-9005
	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	
	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)	
	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

Dell™ PowerEdge™ 650 Systems Installation and Troubleshooting Guide

● Notes, Notices, and Cautions
● Abbreviations and Acronyms

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."