

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

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Notes, Notices, Cautions, and Warnings



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 potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



WARNING: A WARNING indicates a potentially hazardous situation which, if not avoided, may result in severe injury.

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Jumpers and Connectors

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

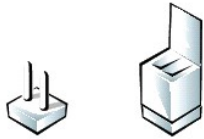
Jumpers—A General Explanation

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 the system board. You may also need to change jumper settings on expansion cards or drives.

Jumpers

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

Figure A-1. Example Jumpers



▲ WARNING: Make sure the system is turned off before you change a jumper setting. Otherwise, damage to the system or unpredictable results may occur.

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

[Figure A-2](#) shows the location and default settings of the jumper blocks on the system board. See [Table A-1](#) for the designations, default settings, and functions of the system's jumpers.

System Board Jumpers

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

Figure A-2. System Board Jumpers

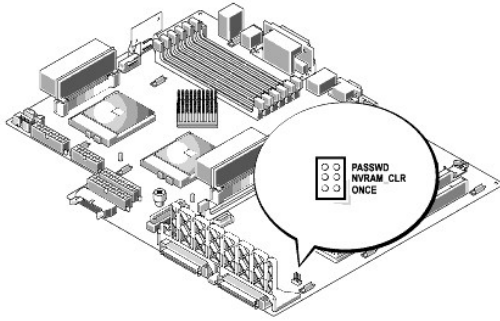









Table A-1. System-Board Jumper Settings

Jumper	Setting	Description
PASSWD	 (default) 	The password feature is enabled. The password feature is disabled.
NVRAM_CLR	 (default) 	The configuration settings are retained at system boot. The configuration settings are cleared at next system boot. (If the configuration settings become corrupted to the point where the system will not boot, install the jumper plug and boot the system. Remove the jumper before restoring the configuration information.)
ONCE		Reserved (<i>do not change</i>).
jumpered  unjumpered 		
NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."		

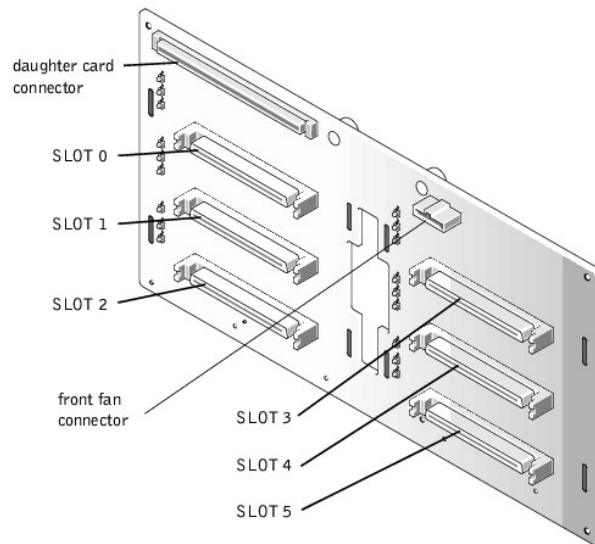
System Board Connectors

See [Figure 6-1](#) and [Table 6-1](#) for the location and description of system board connectors.

SCSI Backplane Board Connectors

[Figure A-3](#) shows the location of the connectors on the back of the SCSI backplane board.

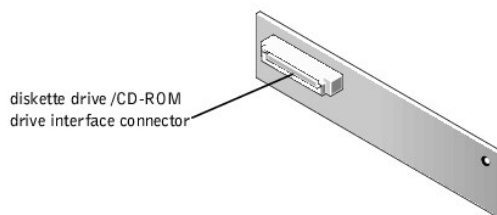
Figure A-3. Connectors on the SCSI Backplane Board



Interposer Board Connectors

[Figure A-4](#) shows the connectors and sockets located on the interposer board.

Figure A-4. Connectors on the Interposer Board



Disabling a Forgotten Password


The computer's software security features include a system password and a setup password, which are discussed in detail in Section 4, "Using the System Setup Program," in the *User's Guide*. A password jumper on the system board enables these password features or disables them and clears any password(s) currently in use.

To disable a forgotten system password or setup password, perform the following steps.

⚠ CAUTION: See "Protecting Against Electrostatic Discharge" in the safety instructions at the front of this guide.

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
2. Remove the system cover.
3. Refer to [Figure A-2](#) for the location of the password jumper (labeled "PASSWD") on the system board.
4. Remove the jumper plug from the PASSWD jumper.
5. Replace the right-side computer cover, and then reconnect the computer to an electrical outlet and turn it on.

The existing passwords are not disabled (erased) until the system boots with the PASSWD 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. Repeat step 1.
7. Install the jumper plug on the PASSWD jumper.
8. Replace the right-side computer cover, and then reconnect the computer and peripherals to their electrical outlets and turn them on.
9. Assign a new system and/or setup password.

To assign a new system password using the System Setup program, see "Assigning a System Password" in the *User's Guide*.

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Abbreviations and Acronyms

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

The following list defines or identifies technical terms, abbreviations, and acronyms used in Dell user documents.

NOTE: Unless otherwise specified, these definitions may not apply to operating systems other than Microsoft® Windows® 95 and Windows NT®.

A

ampere(s)

AC

alternating current

ACPI

Advanced Configuration and Power Interface

ADC

analog-to-digital converter

ADI

Autodesk Device Interface

AI

artificial intelligence

ANSI

American National Standards Institute

APIC

Advanced Peripheral Interrupt Controller

ASCII

American Standard Code for Information Interchange

ASIC

application-specific integrated circuit

B

BASIC

Beginner's All-Purpose Symbolic Instruction Code

BBS

bulletin board service

BIOS

basic input/output system

bpi

bits per inch

bps

bits per second

BTU

British thermal unit

C

Celsius

CCFT

cold cathode fluorescent tube

CD

compact disc

CD-ROM

compact disc read-only memory

CGA

color graphics adapter

cm

centimeter(s)

CMOS

complementary metal-oxide semiconductor

C.O.D.

collect on delivery

cpi

characters per inch

cpl

characters per line

CPU

central processing unit

DAC

digital-to-analog converter

DASH

Dell Advanced SCSI Host

DAT

digital audio tape

dB

decibel(s)

dBA

adjusted decibel(s)

DC

direct current

DIMM

dual in-line memory module

DIN

Deutsche Industrie Norm

DIP

dual in-line package

DMA

direct memory access

DOC

Department of Communications (in Canada)

dpi

dots per inch

DRAC

Dell OpenManage™ Remote Assistant Card

DRAM

dynamic random-access memory

DS/DD

double-sided double-density

DS/HD

double-sided high-density

DSA

Dell SCSI Array

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

FIFO

first-in first-out

ft

feet

g

gram(s)

G

gravities

GB

gigabyte(s)

GUI

graphical user interface

h

hexadecimal

HIP

Hardware Instrumentation Package

HMA

high memory area

HPFS

High Performance File System

Hz

hertz

I/O

input/output

ICBM

inter-chassis management bus

ID

identification

IDE

integrated drive electronics

IRQ

interrupt request

ISA

Industry-Standard Architecture

JEIDA

Japanese Electronic Industry Development Association

K

kilo- (1024)

KB

kilobyte(s)

KB/sec

kilobyte(s) per second

Kb

kilobit(s)

Kbps

kilobit(s) per second

kg

kilogram(s)

kHz

kilohertz

LAN

local area network

lb

pound(s)

LCD

liquid crystal display

LED

light-emitting diode

LIF

low insertion force

LN

load number

lpi

lines per inch

LVD

low voltage differential

m

meter(s)

mA

milliampere(s)

mAh

milliampere-hour(s)

MB

megabyte(s)

Mb

megabit(s)

Mbps

megabit(s) per second

MBR

master boot record

MDA

monochrome display adapter

MGA

monochrome graphics adapter

MHz

megahertz

MMX™

MultiMedia eXtensions

mm

millimeter(s)

ms

millisecond(s)

MS-DOS®

Microsoft Disk Operating System

MTBF

mean time between failures

mV

millivolt(s)

NIC

network interface controller

NiCad

nickel cadmium

NIMH

nickel-metal hydride

NMI

nonmaskable interrupt

NNM

Network Node Manager

ns

nanosecond(s)

NTFS

NT File System

NVRAM

nonvolatile random-access memory

OS/2®

Operating System/2

OTP

one-time programmable

PAL

programmable array logic

PCI

Peripheral Component Interconnect

PCMCIA

Personal Computer Memory Card International Association

PGA

pin grid array

POST

power-on self-test

ppm

pages per minute

PQFP

plastic quad flat pack

PSDB

power-supply distribution board

PS/2

Personal System/2

PVC

polyvinyl chloride

QIC

quarter-inch cartridge

RAID

redundant arrays of independent disks

RAM

random-access memory

RAMDAC

random-access memory digital-to-analog converter

RCU

Resource Configuration Utility

REN

ringer equivalence number

RFI

radio frequency interference

RGB

red/green/blue

ROM

read-only memory

rpm

revolutions per minute

RTC

real-time clock

SCA

Single Controller Architecture

SCSI

small computer system interface

SDS

Scalable Disk System

sec

second(s)

SEC

single-edge contact

SDRAM

synchronous dynamic random-access memory

SIMM

single in-line memory module

SMB

server management bus

SNMP

Simple Network Management Protocol

SRAM

static random-access memory

SSU

system setup utility

SVGA

super video graphics array

TFT

thin film transistor

tpi

tracks per inch

TSR

terminate-and-stay-resident

UMB

upper memory block

UPS

uninterruptible power supply

USOC

Universal Service Ordering Code

V

volt(s)

VAC

volt(s) alternating current

VDC

volt(s) direct current

VESA®

Video Electronics Standards Association

VGA

video graphics array

VLSI

very-large-scale integration

VRAM

video random-access memory

VRM

voltage regulator module

W

watt(s)

WH

watt-hour(s)

X

XMM

extended memory manager

XMS

eXtended Memory Specification

Z

ZIF

zero insertion force

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Introduction

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Other Documents You May Need](#)
- [Getting Help](#)
- [Safety, Regulatory, and Warranty Information](#)

Dell™ PowerEdge™ 2500 systems are high-speed servers that offer significant service and upgrade features. These systems include the following service features to make troubleshooting and repair easy and effective:

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

The following system upgrade options are offered:


- 1 Additional microprocessors
- 1 Additional memory
- 1 A variety of PCI expansion-card options (including RAID controller host adapter cards)
- 1 A DRAC 2 PCI expansion-card for system management

Other Documents You May Need

Besides this *Installation and Troubleshooting Guide*, the following documentation is included with your system:

- 1 The *Dell PowerEdge 2500 Systems User's Guide*, which describes system features and technical specifications, video and SCSI device drivers, the system setup program, and software support utilities.
- 1 The Dell OpenManage™ Server Agent documentation, which describes the features, requirements, installation, and basic operation of the server management software. Refer to the software's online help for information about the alert messages issued by the software.

You may also have one or more of the following documents.

 **NOTE:** Documentation updates are sometimes included with the system to describe changes to the system or software. Always read these updates before consulting any other documentation because the updates often contain information that supersedes the information in the other documents.

- 1 Operating system documentation is included with the system if you ordered the operating system software from Dell. This documentation describes how to install (if necessary), configure, and use the operating system software.
- 1 Documentation is included with any options you purchase separately from the system. This documentation includes information that you need to configure and install these options in your Dell system.
- 1 Technical information files—sometimes called "readme" files—may be installed on the hard-disk drive to provide last-minute updates about technical changes to the system or advanced technical reference material intended for experienced users or technicians.

Getting Help

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

Safety, Regulatory, and Warranty Information

For important safety, regulatory, and warranty information, see the *System Information* document that came with your system.

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Indicators, Messages, and Codes

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Bezel Indicators](#)
- [Front-Panel Indicators and Features](#)
- [Back-Panel Features](#)
- [SCSI Hard-Disk Drive Indicator Codes](#)
- [Redundant Power Supply Features](#)
- [System Messages](#)
- [System Beep Codes](#)
- [Warning Messages](#)
- [Diagnostics Messages](#)
- [Alert Log Messages From the Dell OpenManage Server Agent](#)

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 screen or a beep code may sound.

Several different types of messages can indicate when the system is not functioning properly:

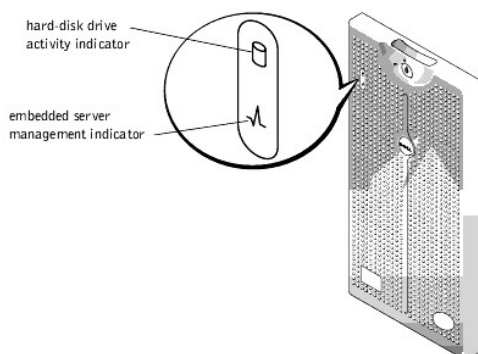
- 1 System messages
- 1 System beep codes
- 1 Warning messages
- 1 Diagnostics messages
- 1 Alert messages
- 1 SCSI hard-disk drive indicator codes

The system indicators and the front and back panel features are illustrated in Figures 2-1 through 2-5. 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. To determine what type of message you have received, read the following sections.

Bezel Indicators

When the bezel is in place on the system, it has two indicators (see [Figure 2-1](#)). The hard-disk drive activity indicator and the ESM indicator. The ESM indicator flashes amber when the system needs attention. The ESM indicator indicates a power problem, a fan/temperature problem, a hard drive problem, or that the PCI expansion cards need attention.

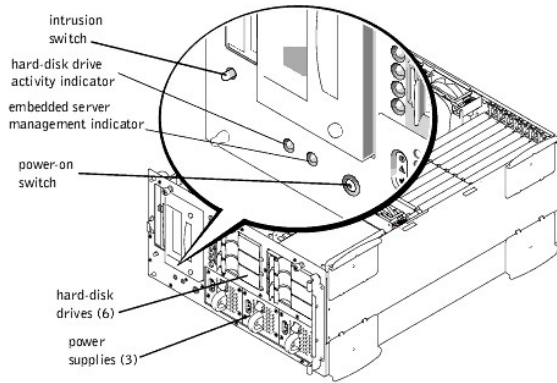
Figure 2-1. Bezel Indicators



Front-Panel Indicators and Features

Two indicators are located on the front-panel: the hard-disk drive indicator and the ESM indicator. The ESM indicator flashes amber when the system needs attention. The amber ESM indicator indicates a power problem, a system fan or power supply fan problem, temperature problem, a hard-disk drive problem, or that the PCI expansion cards need attention. The power supplies and hard-disk drives also have indicators which can be seen when the bezel is removed. The CD-ROM and diskette drives have green activity indicators.

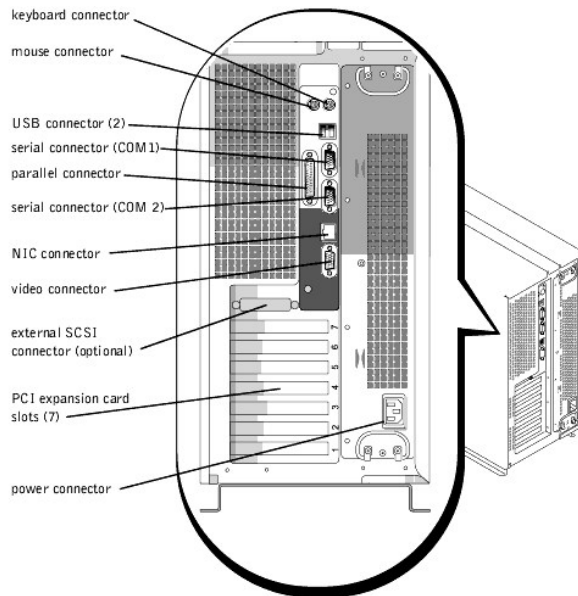
Figure 2-2. Front-Panel Features



Back-Panel Features

[Figure 2-3](#) shows the back-panel features of the non-redundant AC power version of the system.

Figure 2-3. Back-Panel Features



SCSI Hard-Disk Drive Indicator Codes

If you have the integrated RAID controller activated, or an optional PERC 3/Di controller is installed in the system, three indicators on each of the hard-disk drive carriers provide information on the status of the SCSI hard-disk drives (see [Table 2-1](#)). The SCSI backplane firmware controls the drive online and drive failure indicators.

Figure 2-4. Hard-Disk Drive Indicators

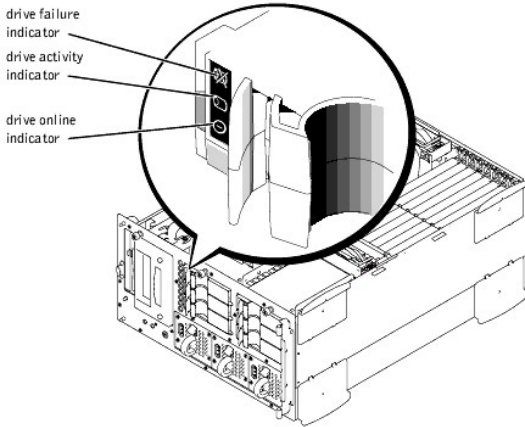


Table 2-1 lists the drive indicator patterns established by the SCSI backplane firmware. Different patterns are displayed as drive events occur in the system. For example, in the event of a hard-disk drive failure, the "drive failed" pattern appears. After the drive is selected for removal, the "drive being prepared for removal" pattern appears, followed by the "drive ready for insertion or removal" pattern. After the replacement drive is installed, the "drive being prepared for operation" pattern appears, followed by the "drive online" pattern.

NOTE: If you do not have the integrated PERC3/Di, or an optional PERC3/DC or PERC3/QC controller installed, you will see only the "drive online" and "drive bay empty" indicator patterns.

Table 2-1. SCSI Hard-Disk Drive Indicator Patterns

Condition	Indicator Code
Identify drive	All three drive status indicators blink simultaneously.
Drive being prepared for removal	The three drive status indicators flash sequentially.
Drive ready for insertion or removal	All three drive status indicators are off.
Drive being prepared for operation	The drive online indicator is on. The drive activity light may flash briefly.
Drive bay empty	All three drive status indicators are off.
Drive predicted failure	The drive online indicator is on. The drive failure indicator blinks on briefly each second.
Drive failed	The drive online indicator turns off. The drive failure indicator blinks off briefly each second.
Drive rebuilding	The drive online indicator blinks rapidly.
Drive online	The drive online indicator is on.

Redundant Power Supply Features

Each power supply has three indicators which indicate the power-on status, fault, and if there is AC power present. These power supplies are hot-pluggable.

Figure 2-5. Power Supply Features

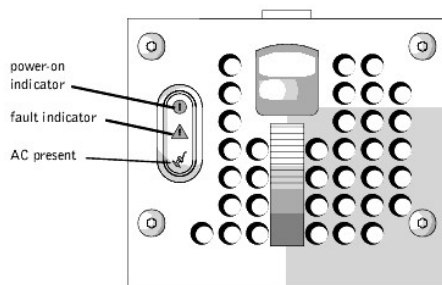


Table 2-2. Power Supply Indicator Patterns

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

System Messages

System messages alert you to a possible operating system problem or to a conflict between the software and hardware. [Table 2-3](#) lists the system error messages that can occur and the probable cause for each message.

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

Table 2-3. System Messages

Message	Cause	Corrective Action
Address mark not found	Faulty diskette/CD-ROM subsystem or hard-disk drive subsystem (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Alert! Maximum memory size exceeded. Limiting memory size to 4 GB	System supports up to 4 GB of memory	Remove a memory module pair so that the maximum amount of memory is 4 GB or less. See " Removing Memory Modules " in "Installing System Board Options."
Alert! Single-bit memory error previously detected in xxxx xxxh	Improperly seated or faulty memory modules	Remove and reseat the memory modules. See " Removing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Removing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Alert! Previous processor thermal failure.	The microprocessor exceeded its recommended operating temperature during the previous operating session.	Remove and Replace the defective microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options."
Alert! Primary processor is out of rev.	System detected that the primary processor is not the correct revision.	Replace the microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options."
Alert! Processor thermal probe failure detected.	Faulty processor or defective system board.	Replace the defective microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem persists, the system is defective. See " Getting Help ," for instructions on obtaining technical assistance.
Alert! Secondary processor is out of rev.	System detected that the secondary processor is not the correct revision.	Replace the microprocessor with a type supported by Dell. See " Adding or Replacing a Microprocessor " in "Installing System Board Options."
Alert! Unsupported memory in DIMM slot(s)	Unsupported memory module(s) installed in specified slot(s)	Replace one or more memory modules so that the memory module pairs are the same type. See " Removing Memory Modules " in "Installing System Board Options."
Alert! Uncorrectable memory error previously detected in xxxx xxxh	Improperly seated or faulty memory modules	Remove and reseat the memory modules. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Attachment failed to respond	Diskette drive or hard-disk drive controller cannot send data to associated drive	Replace the defective drive. See " Installing a Device That Uses the System's Integrated SCSI Controller " in "Installing Drives." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Auxiliary device failure	Mouse cable connector loose or improperly connected, defective mouse	Check the mouse cable connection. " External Connections " in "Troubleshooting Your System." If the problem persists, replace the mouse. See " Getting Help ," for instructions on obtaining technical

		assistance.
Bad command or file name	Command entered does not exist, is faulty, or is not in pathname specified.	Faulty command and syntax, or incorrect filename.
Bad error-correction code(ECC) on disk read Controller has failed	Faulty diskette/CD-ROM subsystem or hard-disk drive subsystem (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Boot: Couldn't find NTLDR	A nonbootable diskette formatted with Win-dows NT was detected in the diskette drive.	A nonbootable diskette is preventing the system from booting. Remove the diskette to boot the system from the hard-disk drive or from a bootable diskette.
CAUTION! NVRAM_CLR jumper is installed on system board. Please run SETUP.	The NVRAM_CLR jumper is installed.	Remove the NVRAM_CLR jumper. See " Figure A-2 " for jumper location. Run the System Setup program to correct the diskette drive type. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions.
CD-ROM drive not found	Improperly connected or missing CD-ROM drive.	Check that the diskette drive/CD-ROM drive unit is seated properly against the interposer board on the peripheral cage. See " Inside the System ," for the location of the diskette drive/CD-ROM drive. Replace the drive. See " Installing a Device That Uses the System's Integrated SCSI Controller " in "Installing Drives." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
CPUs with different level 2 cache sizes detected	Two different types of microprocessors are installed	Install a correct version of the microprocessor so both microprocessors have the same level 2 cache size. See " Adding or Replacing a Microprocessor " in "Installing System Board Options."
Data error	Faulty diskette, diskette drive, or hard-disk drive	Replace the diskette, diskette drive, or hard-disk drive. See " Installing Drives ."
Decreasing available memory	One or more memory modules improperly seated or faulty	Remove and reseat the memory modules. See " Removing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Removing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Diskette drive 0 seek failure Diskette drive 1 seek failure	Faulty or improperly inserted diskette, incorrect configuration settings in System Setup program, loose diskette/CD-ROM interface cable	Replace the diskette. Run the System Setup program to correct the diskette drive type. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions. Check that the diskette drive/CD-ROM drive unit is seated properly against the interposer board on the peripheral cage. See " Installing Drives ."
Diskette read failure	Faulty diskette, faulty or improperly connected diskette/CD-ROM	Check that the diskette drive/CD-ROM drive unit is seated properly against the interposer board on the peripheral cage. See " Installing Drives ."
Diskette subsystem reset failed	Faulty diskette/CD-ROM controller (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Diskette write protected	Diskette write-protect feature activated	Move the write-protect tab on the diskette.
Drive not ready	Diskette missing from or improperly inserted in diskette drive	Reinsert or replace the diskette.
Embedded server management error Embedded server management is not present	Embedded server management memory may be temporarily corrupted	Shut down the system to clear the memory, and then restart the system. If the problem persists, see " Getting Help ," for instructions on obtaining technical assistance.
Gate A20 failure	Faulty keyboard controller (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
General failure	Operating system corrupted or not installed properly	Reinstall the operating system.
Hard disk controller failure Hard disk drive read failure Hard disk failure	Incorrect configuration settings in System Setup program, improperly connected hard-disk drive, faulty hard-disk drive controller subsystem (defective system board), or loose power cable	Check the hard-disk drive configuration settings in the System Setup program. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions. Reinstall the hard-disk drive. See " Installing Drives ." Check the interface cable and power cable connections to the backplane board. See " Installing Drives ."
Invalid configuration information - please run SETUP program	Incorrect configuration settings in System Setup program, or faulty battery	Check the System Setup configuration settings. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions. Replace the battery. See " Replacing the System Battery " in "Installing System Board Options."


Invalid CPU speed detected	Microprocessor not supported by system	Install a correct version of the microprocessor in the specified microprocessor connector. See " Adding or Replacing a Microprocessor " in "Installing System Board Options."
Invalid NVRAM configuration, resource reallocated	System detected and corrected a resource conflict when system resources were allocated using the System Setup program.	No action is required.
I/O parity interrupt at <i>address</i>	Expansion card improperly installed or faulty	Reinstall the expansion cards. See " Installing an Expansion Card " in "Installing System Board Options." If the problem persists, replace the expansion card. See " Removing an Expansion Card " in "Installing System Board Options."
Keyboard failure Keyboard data line failure Keyboard stuck key failure Keyboard clock line failure	Keyboard cable connector loose or improperly connected, defective keyboard, or defective keyboard/mouse controller (defective system board)	Check the keyboard cable connection. Replace the keyboard. If the problem persists, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Keyboard controller failure	Defective keyboard/mouse controller (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Memory address line failure at <i>address</i> , read value expecting <i>value</i> Memory data line failure at <i>address</i> , read value expecting <i>value</i> Memory double word logic failure at <i>address</i> , read value expecting <i>value</i> Memory odd/even logic failure at <i>address</i> , read value expecting <i>value</i> Memory write/read failure at <i>address</i> , read value expecting <i>value</i>	Faulty or improperly seated memory modules or defective system board	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Memory allocation error	Faulty application	Restart the application.
Memory parity interrupt at <i>address</i>	Improperly seated or faulty memory modules	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
Memory tests terminated by keystroke	POST memory test terminated by pressing the spacebar	No action is required.
No boot device available	Faulty diskette, diskette/CD-ROM subsystem, hard-disk drive, hard-disk drive subsystem, or no boot disk in drive A	Replace the diskette or hard-disk drive. See " Installing Drives ," If the problem persists, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
No boot sector on hard-disk drive	Incorrect configuration settings in System Setup program, or no operating system on hard-disk drive	Check the hard-disk drive configuration settings in the System Setup program. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions.
No timer tick interrupt	Defective system board	Replace the system board. See, " Getting Help ," for instructions on obtaining technical assistance.
Non-system disk or disk error	Faulty diskette, diskette/CD-ROM subsystem, or hard-disk drive subsystem	Replace the diskette or hard-disk drive. See " Installing Drives ," If the problem persists, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
Not a boot diskette	No operating system on diskette	Use a bootable diskette.
Processor in socket 1 not installed!	No microprocessor installed in primary microprocessor socket	Install a VRM or a microprocessor in the primary microprocessor socket. See " Microprocessor Upgrades " in "Installing System Board Options."
Read fault Requested sector not found	Faulty diskette, diskette/CD-ROM subsystem, or hard-disk drive subsystem (defective system board)	Replace the diskette or hard-disk drive. See " Installing Drives ," If the problem persists, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.

Reset failed	Improperly connected diskette/CD-ROM, hard-disk drive, or power cable	Check that the diskette drive/CD-ROM drive unit is seated properly against the interposer board on the peripheral cage. See "Installing Drives." Reinstall the hard-disk drive. Check the interface cable and power cable connections to the backplane board. See "Installing Drives."
ROM bad checksum = address	Expansion card improperly installed or faulty	Reinstall the expansion cards. See "Installing an Expansion Card" in "Installing System Board Options." If the problem persists, replace the expansion card. See "Removing an Expansion Card" in "Installing System Board Options." If the problem still persists, replace the system board. See "Getting Help," for instructions on obtaining technical assistance.
Sector not found	Defective sectors on diskette or hard-disk drive	Replace the diskette or hard-disk drive. See "Installing Drives."
Seek error	Defective sectors on diskette or hard-disk drive	Replace the diskette or hard-disk drive. See "Installing Drives."
Seek operation failed	Faulty diskette or hard-disk drive	Replace the diskette or hard-disk drive. See "Installing Drives."
Shutdown failure	Defective system board	Replace the system board. See "Getting Help," for instructions on obtaining technical assistance.
System halted	System microprocessor is not a type supported by Dell.	Replace the microprocessor with a type supported by Dell. See "Adding or Replacing a Microprocessor" in "Installing System Board Options."
System backplane cable error	Improperly attached interface cables	Check the primary and secondary SCSI interface cable connections to the backplane board. See "Troubleshooting Hard-Disk Drives" in "Troubleshooting Your System."
System backplane error	Improperly attached or missing backplane	Check the interface cable connections to the backplane board. See "Troubleshooting Hard-Disk Drives" in "Troubleshooting Your System."
Time-of-day clock stopped	Defective battery or faulty chip (defective system board)	Replace the system battery. See "Replacing the System Battery" in "Installing System Board Options." If the problem persists, replace the system board. See "Getting Help," for instructions on obtaining technical assistance.
Time-of-day not set - please run SETUP program	Incorrect Time or Date settings or defective system battery	Check the Time and Date settings. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions. If the problem persists, replace the system battery. See "Replacing the System Battery" in "Installing System Board Options." If the problem still persists, replace the system board. See "Getting Help," for instructions on obtaining technical assistance.
Timer chip counter 2 failed	Defective system board	Replace the system board. See "Getting Help," for instructions on obtaining technical assistance.
Unexpected interrupt in protected mode	Improperly seated memory modules or faulty keyboard/mouse controller chip (defective system board)	Remove and reseal the memory modules. See "Installing Memory Modules" in "Installing System Board Options." If the problem persists, replace the memory modules. See "Installing Memory Modules" in "Installing System Board Options." If the problem still persists, see "Getting Help," for instructions on obtaining technical assistance.
Unsupported CPU detected in Socket n Unsupported CPU speed detected!	Microprocessor not supported by system	Install a correct version of the microprocessor in the specified microprocessor socket. See "Microprocessor Upgrades" in "Installing System Board Options."
Unsupported CPU speed in CMOS	Microprocessor not supported by BIOS	Upgrade the BIOS. See "Using the System Setup Program," in the <i>User's Guide</i> for instructions.
Unsupported DIMM installed in the RAID DIMM slot!	RAID DIMM not supported by system	Install a correct version of the RAID DIMM. See "Activating the Integrated RAID Controller" in "Installing System Board Options."
Unsupported RAID key detected!	RAID hardware key not supported by system	Install the RAID hardware key for your specific system. See "Activating the Integrated RAID Controller" in "Installing System Board Options."
Utility partition not available	<F10> key was pressed during POST, but no utility partition exists on the boot hard-disk drive	Create a utility partition on the boot hard-disk drive. See "Using the <i>Dell OpenManage Server Assistant</i> CD" in your <i>User's Guide</i> .
Warning! Detected mode switch from RAID to SCSI on the onboard RAID channel. Data loss will occur! Press Y to confirm the change; press any other key to cancel.	Type of controller has changed since previous system boot	Back up information on the drives before changing the type of controller used with the hard-disk drives.

Write fault	Faulty diskette or hard-disk drive	Replace the diskette or hard-disk drive. See " Installing Drives ."
Write fault on selected drive		
NOTE: For the full name of an abbreviation or acronym used in this table, see " Abbreviations and Acronyms ."		

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. The beep code is a pattern of sounds; for example, one beep followed by a second beep and then a burst of three beeps (code 1-1-3) means that the system was unable to read the data in NVRAM. This information is valuable to the Dell technical support representative if you need to call for technical assistance.

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

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 the Dell Diagnostics to identify a more serious cause. If you are still unable to resolve the problem, see "[Getting Help](#)," for instructions on obtaining technical assistance.


Table 2-4. System Beep Codes

Code	Cause	Corrective Action
1-1-3	CMOS write/read failure	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
1-1-4	BIOS checksum failure	This fatal error usually requires that you replace the BIOS firmware. See " Getting Help ," for instructions on obtaining technical assistance.
1-2-1	Programmable interval-timer failure	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
1-2-2	DMA initialization failure	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-2-3	DMA page register write/read failure	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-3-1	Main-memory refresh verification failure	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-3-2	No memory installed	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-3-3	Chip or data line failure in the first 64 KB of main memory	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-3-4	Odd/even logic failure in the first 64 KB of main memory	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-4-	Address line failure in the first 64 KB of main memory	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
1-4-2	Parity failure in the first 64 KB of main memory	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
3-1-1	Slave DMA-register failure	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
3-1-2	Master DMA-register failure	
3-1-3	Master interrupt-mask register failure	
3-1-4	Slave interrupt-mask register failure	
3-2-4	Keyboard-controller test failure	Check the keyboard cable and connector for proper connection. If the problem persists, run the keyboard test in the Dell Diagnostics to determine whether the keyboard or keyboard controller is faulty. If the keyboard controller is faulty, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
3-3-1	CMOS failure	Run the system board test in the Dell Diagnostics to isolate the problem.

3-3-2	System configuration check failure	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
3-3-3	Keyboard controller not detected	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
3-3-4	Screen initialization failure	Run the video test in the Dell Diagnostics.
3-4-2	Screen-retrace test failure	
3-4-3	Search for video ROM failure	
4-2-1	No timer tick	Replace the system board. " Getting Help ," for instructions on obtaining technical assistance.
4-2-2	Shutdown failure	
4-2-3	Gate A20 failure	
4-2-4	Unexpected interrupt in protected mode	Ensure that all expansion cards are properly seated, and then reboot the system.
4-3-1	Improperly seated or faulty memory modules	Remove and reseat the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem persists, replace the memory modules. See " Installing Memory Modules " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
4-3-3	Defective system board	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
4-3-4	Time-of-day clock stopped	Replace the battery. See " Replacing the System Battery " in "Installing System Board Options." If the problem persists, replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
4-4-1	Super I/O chip failure (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
4-4-2	Parallel-port test failure (defective system board)	Replace the system board. See " Getting Help ," for instructions on obtaining technical assistance.
4-4-3	Math coprocessor failure (defective microprocessor)	Remove and reseat the specified microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem persists, replace the microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
4-4-4	Cache test failure (defective microprocessor)	Remove and reseat the specified microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem persists, replace the microprocessor. See " Adding or Replacing a Microprocessor " in "Installing System Board Options." If the problem still persists, see " Getting Help ," for instructions on obtaining technical assistance.
NOTE: For the full name of an abbreviation or acronym used in this table, see " Abbreviations and Acronyms ."		

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, as a way to protect against inadvertently erasing or writing over the data. These 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. See "[Finding Software Solutions](#)," and the documentation that accompanied the operating system and application program for more information on warning messages.

Diagnostics Messages

When you run a test group or subtest in the Dell Diagnostics, an error message may result. These particular 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 Log Messages From the Dell OpenManage Server Agent

The optional Dell OpenManage Server Agent management application program generates alert messages that appear in the SNMP trap log file. To see the trap log, select any enterprise under the SNMP trap log icon. Alert log messages consist of information, status, warning, and failure messages for drive, temperature, fan, and power conditions. More information about the **Alert Log** window and options is provided in the Dell OpenManage Server Agent documentation found on the *Dell Online Documentation CD*.

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Finding Software Solutions

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Installing and Configuring Software](#)
- [Using Software](#)

Because most systems have several application programs installed in addition to the operating system, isolating a software problem can be confusing. Software errors can also appear to be hardware malfunctions at first.

Software problems can result from the following circumstances:

- 1 Improper installation or configuration of a program
- 1 Input errors
- 1 Device drivers that may conflict with certain application programs
- 1 Interrupt conflicts between devices

You can confirm that a system problem is caused by software by running the Dell Diagnostics. If all tests in the test group are completed successfully, the problem is most likely caused by software.

This section provides some general guidelines for analyzing software problems. For detailed troubleshooting information on a particular program, see the documentation that accompanied the software or consult the support service for the software.

Installing and Configuring Software

Use virus-scanning software to check newly acquired programs and files for viruses before installing the programs on the system's hard-disk drive. Viruses can quickly use all available system memory, damage and/or destroy data stored on the hard-disk drive, and permanently affect the performance of the programs they infect. Several commercial virus-scanning programs are available for purchase.

Before installing a program, read its documentation to learn how the program works, what hardware it requires, and what its defaults are. A program usually includes installation instructions in its accompanying documentation and a software installation routine.

The software installation routine assists users in transferring the appropriate program files to the system's hard-disk drive. Installation instructions may provide details about how to configure the operating system to successfully run the program. Always read the installation instructions before running a program's installation routine.

When you run the installation routine, be prepared to respond to prompts for information about how the system's operating system is configured, what type of system you have, and what peripherals are connected to the system.

Using Software

The following subsections discuss errors that can occur as a result of software operation or configuration.

Error Messages

Error messages can be produced by an application program, the operating system, or the system. Messages and Codes discusses the error messages that are generated by the system. If you receive an error message that is not listed in "[Indicators, Messages, and Codes](#)," check the operating system or application program documentation.

Input Errors

If a specific key or set of keys is pressed at the wrong time, a program may give you unexpected results. See the documentation that came with the application program to make sure that the values or characters you are entering are valid.

Make sure that the operating environment is set up to accommodate the programs you use. Keep in mind that whenever you change the parameters of the system's operating environment, you may affect the successful operation of the programs. Sometimes, after modifying the operating environment, you may need to reinstall a program that no longer runs properly.

Program Conflicts

Some programs may leave portions of their setup information behind, even though you have exited from them. As a result, other programs cannot run. Rebooting the system can confirm whether these programs are the cause of the problem.

Device drivers, which are programs that use specialized subroutines, can cause problems with the system. For example, a variation in the way the data is sent to the

monitor may require a special screen driver program that expects a certain kind of video mode or monitor. In such cases, you may have to develop an alternate method of running that particular program—by creating a start-up file made especially for that program, for example. Call the support service for the software you are using to help you with this problem.

Avoiding Interrupt Assignment Conflicts

Problems can arise if two devices attempt to use the same IRQ line. To avoid this type of conflict, check the documentation for the IRQ line's default for each installed expansion card. Then consult [Table 3-1](#) to configure the card for one of the available IRQ lines.

Table 3-1. IRQ Line Assignment Defaults

IRQ Line	Used By/Available
IRQ0	Used by the system timer
IRQ1	Used by the keyboard controller
IRQ2	Used by interrupt controller 1 to enable IRQ8 through IRQ15
IRQ3	Used by serial port 2 (COM2 and COM4)
IRQ4	Used by serial port 1 (COM1 and COM3)
IRQ5	Available unless used by a secondary parallel port
IRQ6	Used by the diskette drive controller
IRQ7	Used by the primary parallel port
IRQ8	Used by the real-time clock
IRQ9	Used for power management functions
IRQ10	Available
IRQ11	Available
IRQ12	Used by the PS/2 mouse port unless the mouse is disabled in the System Setup program
IRQ13	Used by the math coprocessor
IRQ14	IDE CD-ROM controller
IRQ15	Embedded server management

NOTE: For the full name of an abbreviation or acronym used in this table, see the abbreviations and acronyms list at the end of this guide.

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Running the Dell™ Diagnostics

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Features of the Dell Diagnostics](#)
- [When to Use the Dell Diagnostics](#)
- [Starting the Dell Diagnostics](#)
- [How to Use the Dell Diagnostics](#)
- [How to Use the Device Groups Menu](#)
- [Device Groups Menu Options](#)
- [Error Messages](#)

Unlike many diagnostic programs, the Dell Diagnostics helps you check the system's hardware without any additional equipment and without destroying any data. By using the diagnostics, you can have confidence in the system's operation. If you find a problem that you cannot solve by yourself, the diagnostic tests can provide you with important information you will need when talking to Dell's technical assistance representative.

- ➡ **NOTICE:** Use the Dell Diagnostics to test only Dell systems. If you use this program with other systems, incorrect system responses or error messages may result.
-

Features of the Dell Diagnostics

The Dell Diagnostics provides a series of menus and options from which you choose particular device groups or devices. You can also control the sequence in which the tests are run. The diagnostic menus also have these helpful features:

- 1 Options that let you run tests individually or collectively
 - 1 An option that allows you to choose the number of times a test is repeated
 - 1 The ability to display or print test results or to save them in a file
 - 1 Options to temporarily suspend testing if an error is detected or to terminate testing when an adjustable error limit is reached
 - 1 Help messages that briefly describe each test and its parameters
 - 1 Status messages that inform you whether device group or device tests are completed successfully
 - 1 Error messages that appear if any problems are detected
-

When to Use the Dell Diagnostics

Whenever a major component or device in the system does not function properly, you may have a component failure. As long as the microprocessor and the input and output components of the system (the monitor, keyboard, and diskette drive) are working, you can use the Dell Diagnostics. If you know what component(s) you need to test, simply select the appropriate diagnostic device group(s) or subtest(s). If you are unsure about the scope of the problem, read the rest of the information in this section.

Starting the Dell Diagnostics

You can run the Dell Diagnostics from either the utility partition on your hard-disk drive or from a set of diskettes that you create from the *Dell OpenManage Server Assistant CD*.

To run the diagnostics from the utility partition, perform the following steps:

1. Start the utility partition by pressing <F10> during POST.
2. From the utility partition's main menu, select the **Run System Diagnostics** option from **Run System Utilities**.


See "Utility Partition" in "Using the *Dell OpenManage Server CD*," in the *User's Guide* for additional information about the utility partition.

To run the Dell Diagnostics from the diskettes, perform the following steps:

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

If the system fails to boot, see "[Getting Help](#)," for instructions on obtaining technical assistance.

When you start the diagnostics a message is displayed telling you that the diagnostics is loading. The **Diagnostics** menu appears. The menu allows you to run all or specific diagnostic tests or to exit the Dell Diagnostics.

 **NOTE:** Before you read the rest of this section, you may want to start the Dell Diagnostics so that you can see it on your monitor screen.

For a quick check of the system, select **Test All Devices** and then select **Quick Tests**. This option runs only the device tests that do not require user interaction and that do not take a long time to run. Dell recommends that you choose this option first to increase the chance of tracing the source of the problem quickly. For a complete check of the system, select **Test All Devices** and then select **Extended Tests**. To check a particular area of the system, choose **Advanced Testing**.

Selecting **Exit to MS-DOS** exits the diagnostics and returns you to the MS-DOS® operating system environment.

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 you choose.

How to Use the Dell Diagnostics

When you select **Select Devices to Test** from the **Diagnostics** menu, the main screen of the diagnostics appears.

Information on the main screen of the diagnostics is presented in the following areas:

- 1 Two lines at the top of the main screen identify the diagnostics and give its version number.
 - 1 On the left side of the screen, the **Device Groups** area lists the diagnostic device groups in the order they will run if you select **All** under the **Run Tests** submenu. Press the up- or down-arrow key to highlight a device group.
 - 1 On the right side of the screen, the **Devices for Highlighted Group** area lists the specific devices within a particular test group.
 - 1 Two lines at the bottom of the screen make up the menu area. The first line lists the menu options you can select; press the left- or right-arrow key to highlight an option. The second line gives information about the highlighted option.
-

How to Use the Device Groups Menu

The **Device Groups** menu at the bottom of the screen provides options that enable you to select and run specific diagnostic tests from the diagnostics main screen. Press the left- and 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 on the bottom line of the screen.

If you want more information about a device group or device, highlight the **Help** option and press <Enter>. After you read the information, press <Esc> to return to the previous screen.

Device Groups Menu Options

Five options are listed at the bottom of the diagnostics main screen: **Run Tests**, **Devices**, **Select**, **Config**, and **Help**.

There are two ways to select a menu option:

- 1 Look on the screen to see which letter in the option is capitalized, and type that letter (for example, type r to select the **Run** option).
- 1 Move the highlight to the option you want to select by pressing the left- or right-arrow key, and then press <Enter>.

Whenever one of the options is selected, additional choices become available.

The following subsections explain the menu options as listed from left to right in the **Device Groups** menu.

Run Tests

Run Tests displays seven options: **One**, **All**, **Select**, **Options**, **Results**, **Errors**, and **Help**. If you select **One**, all the devices within the highlighted device group are run. If you select **All**, all of the tests in all of the device group tests are run. (The device group tests are run in the same order as they are listed.) If you choose **Select**, only the selected device groups or the devices that you selected within the device groups are run. Before you test any device groups or devices, consider setting global parameters within **Options**. Global parameters offer you greater control over how the device group tests or device tests are run and how results are reported. **Help** displays a series of help options, including **Menu**, **Keys**, **Device**, **Group**, and **Test**.

Devices

Most of the device groups consist of several devices. Use the **Devices** option to select individual devices within the device group(s).

When you select **Devices**, the following options are displayed: **Run Tests**, **Tests**, **Select**, **Parameters**, and **Help**. [Table 4-1](#) lists all of the possible values for each option.

Table 4-1. Devices Options

Option	Functions
Run Tests	Displays five options: Run Tests , Tests , Select , Parameters , and Help .
Tests	Allows you to select individual devices to tailor the testing process to your particular needs. You can choose one or more devices from the list. When you choose Tests , four options are displayed: Run Tests , Select , Parameters , and Help .
Select	Allows you to choose one or more devices from a particular device group. Three options are displayed: One , All , and Help .
Parameters	Determines how a particular test will be run. Table 4-2 lists all of the possible values for each option. To change Parameters options, press the spacebar, the left- and right-arrow keys, or the plus (+) and minus (-) keys.
Help	Displays a list of help topics.

Table 4-2. Parameters Options

Option	Possible Values
Number of Times to Repeat Test(s)	0001 through 9999 or 0000 , which loops indefinitely until you press <Ctrl><Break>. The default is 1 .
Maximum Errors Allowed	0000 through 9999 , where 0000 means that there is no error limit. The default is 1 .
Pause for User Response	Yes, No Allows you to decide whether tests will wait for user input. The default is Yes to wait for user input.
Message Logging	None, Errors, All Determines if any test results are saved to a file. The default is None .
Message Logging File Name	Specifies the name of the logging file if the Message Logging option is selected. The default is A: RESULT .

Select

The **Select** option in the **Device Groups** menu allows you to choose one or more devices from a particular device group. Three options are displayed: **One**, **All**, and **Help**.

Config

Choosing **Config** from the **Device Groups** menu displays information about the particular device that is highlighted.

Error Messages

When you run a test in the diagnostics, error messages may result. Record the messages on a copy of the Diagnostics Checklist; also see "[Getting Help](#)," for instructions on obtaining technical assistance and informing the technical assistance representative of these messages.

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Troubleshooting Your System

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

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If your system is not working as expected, begin troubleshooting using the procedures in this section. This section guides you through some 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, take the following steps:

- 1 Lay the system on its side.
- 1 Read the "Safety Instructions" in your *System Information* document.
- 1 Read "[Running the Dell™ Diagnostics](#)" for information about running diagnostics.
- 1 Get the key to the system keylock.

Safety First—For You and Your System

The procedures in this guide require that you remove the 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 Dell documentation. Always follow the instructions closely. Make sure to review all of the procedures in "Safety Instructions" in your *System Information* document.

Working inside the system is safe—if you observe the following precautions.

-  **WARNING:** The power supplies in this system produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to remove the system cover and access any of the components inside the system.
-  **CAUTION:** See "Protecting Against Electrostatic Discharge" in the Safety Instructions in your *System Information* document before performing any procedure which requires you to open the cover.

External Connections

Improperly set switches, controls, and loose or improperly connected cables are the most likely source of problems for the system, monitor, or other peripherals (such as a printer, keyboard, mouse, or other external equipment). A quick check of all the switches, controls, and cable connections can easily solve these problems. See [Figure 2-3](#) for the back-panel features and connectors.

Checking Specific System Problems

1. Turn off the system, including any attached peripherals. Disconnect all the power cables from their electrical outlets.
2. If the system is connected to a PDU, turn the PDU off and then on again.

If it 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.

4. Is the monitor working properly?
See "[Troubleshooting the Video Subsystem](#)."
5. Is the keyboard working properly?
See "[Troubleshooting the Keyboard](#)."
6. Are the mouse and printer working properly?
See "[Troubleshooting the Basic I/O Functions](#)."

Start-Up Routine

Looking at and listening to the system is important in determining the source of a problem. Look and listen during the system's start-up routine for the indication described in [Table 5-1](#).

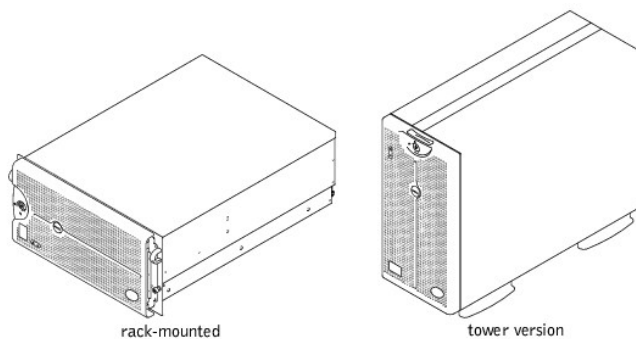
Table 5-1. Start-Up Routine Indications

Look/Listen for:	Action
An error message	See " Indicators, Messages, and Codes ."
Alert messages from the Dell OpenManage Server Agent software	See " Alert Log Messages From the Dell OpenManage Server Agent " in "Indicators, Messages, and Codes."
The monitor's power indicator	See " Troubleshooting the Video Subsystem ."
The keyboard indicators	See " Troubleshooting the Keyboard ."
The diskette-drive access indicator	See " Troubleshooting the Diskette Drive ."
The hard-disk drive activity indicators	See " Troubleshooting Hard-Disk Drives ."
A series of beeps	See, " Indicators, Messages, and Codes ."
An unfamiliar constant scraping or grinding sound when you access a drive	See " Getting Help ," for instructions on obtaining technical assistance from Dell.

System Orientation

[Figure 5-1](#) shows the rack-mounted and tower version of your system. The illustrations in this document are based on the tower version. Most of the illustrations will depict the system laying on its side.

Figure 5-1. System Orientation



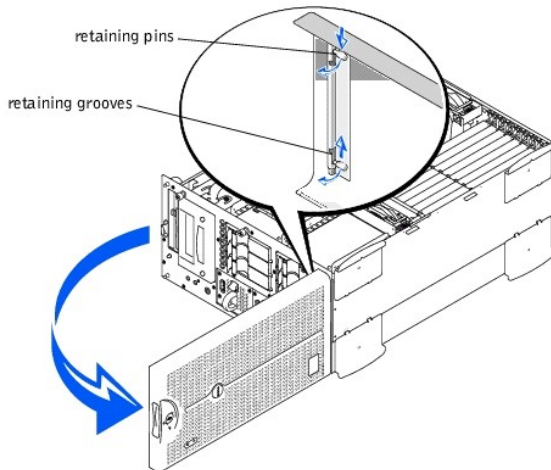
Removing and Replacing the Front Bezel

The front bezel has status and attention indicators. Swinging the front bezel open provides access to the power switch, diskette drive, CD-ROM drive, hard-disk drive (s), and power supplies. You must open or remove the front bezel and remove the system cover to gain access to internal components.

Removing the Front Bezel

1. Using the system key, unlock the front bezel.
2. Pull the bezel away from the system so that it is perpendicular to the system (see [Figure 5-2](#)).

Figure 5-2. Removing the Front Bezel



3. Squeeze the retaining pins (see [Figure 5-2](#)).
4. Rotate the pins upward into the retaining grooves to remove the bezel.

Replacing the Front Bezel

NOTE: The retaining pins are spring loaded. After rotating the pins downward and releasing the pins, they will automatically be inserted into the retaining hinge. You may need to move the bezel slightly to properly align the pins with the retaining hinge.

1. Align the two bezel retaining pins with the retaining hinge on the front of the system.
2. Rotate the pins downward, and release the pins to attach the bezel to the system.
3. Swing the bezel closed until the bezel snaps into place.
4. Using the system key, lock the bezel.

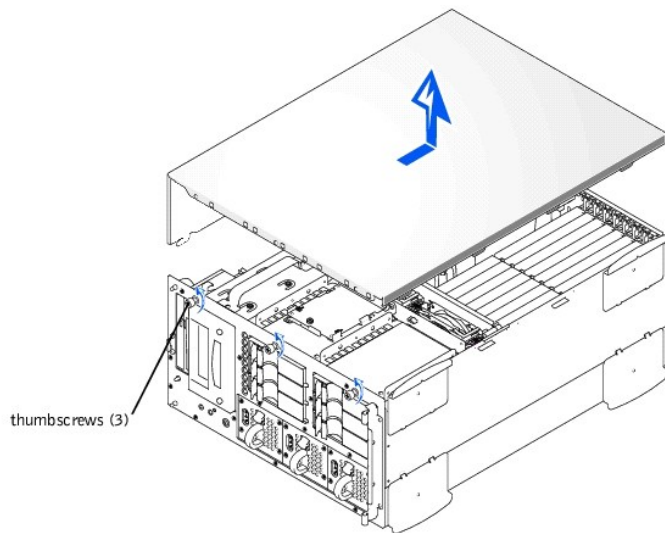
Removing and Replacing the System Cover

The system is enclosed by a front bezel and a cover. To upgrade or troubleshoot the system, remove the system cover to gain access to internal components.

Removing the System Cover

1. Open the front bezel.
See "[Removing the Front Bezel](#)."
2. Observe the precautions in "[Safety First—For You and Your System](#)."
3. Loosen the three thumbscrews on the front of the system (see [Figure 5-3](#)).
4. Slide the system cover backwards and grasp the cover at both ends.
5. Carefully lift the cover away from the system.

Figure 5-3. Removing the System Cover



Replacing the System Cover

1. Check that no tools or parts are left inside the system.
 2. Fit the cover over the sides of the chassis, and slide the cover forward.
 3. Secure the cover with the three thumbscrews.
 4. Close the front bezel.
-

Checking the Equipment

This section provides troubleshooting procedures for equipment that connects directly to the I/O panel of the system, such as the monitor, keyboard, or mouse. Before you perform any of the procedures, see "[External Connections](#)."

Troubleshooting the Video Subsystem

Problem

- 1 Monitor
- 1 Monitor interface cable
- 1 Video memory
- 1 Video logic

Action

1. Check the system and power connections to the monitor.
2. Run the video tests in the Dell 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](#)" for instructions on obtaining technical assistance.

Troubleshooting the Keyboard

Problem

- 1 A system error message indicates a keyboard problem

Action

1. Look at the keyboard and the keyboard cable for any signs of damage.

2. Press and release each key on the keyboard.

If the keyboard and its cable appear to be free of physical damage, and the keys work, go to step 4.

If the keyboard or its cable are damaged, continue to step 3.

3. Swap the faulty keyboard with a working keyboard.

If the problem is resolved, the keyboard must be replaced. See "[Getting Help](#)," for instructions on obtaining technical assistance.

4. Run the keyboard test in the Dell Diagnostics.

If you can use the keyboard to select the keyboard test, go to step 6.

If you cannot use the keyboard to select the keyboard test, continue to step 5.

5. Swap the faulty keyboard with a working keyboard.

6. Did the keyboard test run successfully?

If the problem is resolved, the keyboard must be replaced. If the problem is not resolved, the keyboard controller on the system board is faulty. See "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting the Basic I/O Functions

Problem

- 1 A system error message indicates an I/O port problem
- 1 A device connected to the port does not function properly

Action

1. Enter the System Setup program, and check the **Serial Port 1**, **Serial Port 2**, and **Parallel Port** settings.

If the communications ports are set to **Enabled**, go to step 3.

If the communications ports are not set to **Enabled**, continue to step 2.

2. Change the **Serial Port 1**, **Serial Port 2**, and **Parallel Port** settings to **Enabled**; then reboot the system.

3. Check the system setup. See "Using the System Setup Program" in the *User's Guide* for instructions.

If the system setup is correct, go to step 5.

4. Change the necessary statements in the system setup. If the port problem is confined to a particular application program, see the application program's documentation for specific port configuration requirements.

5. Reboot the system from the diagnostics diskette, and run the serial ports test and/or the parallel ports test in the Dell Diagnostics.

If the tests did not run successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

6. If the problem persists, see one of the following procedures, "[Troubleshooting a Parallel Printer](#)" or "[Troubleshooting a Serial I/O Device](#)," depending on the malfunctioning device.

Troubleshooting a Serial I/O Device

Problem

- 1 Device connected to one of the serial ports is not working

Action

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

If there is only one serial device connected to the system, go to step 4.

2. Disconnect the devices from the serial ports, and connect the malfunctioning device to the other port.

3. Turn on the power to the system.

If the problem is resolved, the serial port may be defective. See "[Getting Help](#)," for instructions on obtaining technical assistance.

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

If the problem is resolved, the interface cable must be replaced. See "[Getting Help](#)," for instructions on obtaining technical assistance.

5. Turn off the system and the serial device, and swap the device with a comparable device.
6. Turn on the power to 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](#)," for instructions on obtaining technical assistance.

Troubleshooting a Parallel Printer

Problem

1. Parallel printer is not working

Action

1. Turn off the power from the printer and the system.
2. Swap the parallel printer interface cable with a known working cable.
3. Turn on the power to the printer and the system.
4. Attempt to print with the printer.

If the print operation is successful, the interface cable must be replaced. See "[Getting Help](#)," for instructions on obtaining technical assistance.

5. Run the printer's self-test.

If the self-test is not successful, the printer is probably defective. If the printer was purchased from Dell, see "[Getting Help](#)," for instructions on obtaining technical assistance.

6. Attempt to print on the parallel printer.

If the print operation is not successful, the see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting a USB Device

Problem

1. A system error message indicates a problem.
1. Device connected to the port is not working.

Action

1. Enter the System Setup program, and check that the USB ports are enabled. See "Using the System Setup Program" in the *User's Guide* for instructions.
2. Turn off the system and any USB devices.

If there is only one USB device connected to the system, go to step 5.

3. Disconnect the USB devices, and connect the malfunctioning device to the other port.
4. Apply power to the system and the reconnected device.

If the problem is resolved, the USB port may be defective. See "[Getting Help](#)," for instructions on obtaining technical assistance.

5. 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](#)," for instructions on obtaining technical assistance.

6. Turn off the system and the USB device, and swap the device with a comparable device.
7. Turn on the power to 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](#)," for instructions on obtaining technical assistance.

Troubleshooting the Integrated NIC

Problem

- 1 NIC cannot communicate with net

Action

1. Enter the System Setup program and confirm that the NIC is enabled.

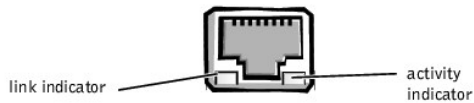
See "Using the System Setup Program" in the *User's Guide* for instructions.

2. Check the two indicators on the left and right corners of the NIC connector on the system's back-panel (see [Figure 5-4](#)).

The green link indicator shows that the adapter is connected to a valid link partner. The amber *activity indicator* lights if network data is being sent or received.

- 1 If the link indicator is not on, check all cable connections.
 - 1 Try changing the auto-negotiation setting, if possible.
 - 1 Try another port on the switch or hub.
3. If the *activity indicator* does not light, the network driver files might be damaged or deleted.
4. Reinstall the drivers.
5. Make sure the appropriate drivers are installed and the protocols are bound.

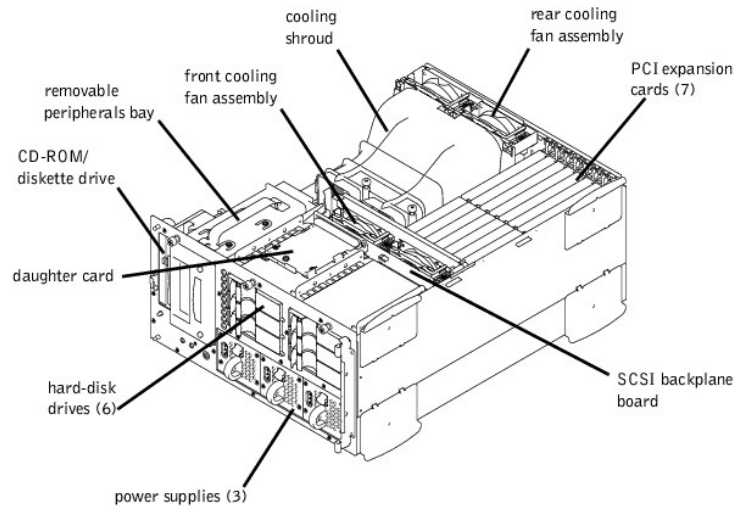
Figure 5-4. NIC Indicators



Inside the System

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

Figure 5-5. Inside the System



The system board holds the system's control circuitry and other electronic components. Several hardware options such as the microprocessors and memory are installed directly on the system board. The system board can accommodate up to seven PCI expansion cards (two cards at 64-bit/66 MHz, three cards at 64-bit/33 MHz, and two cards at 32-bit/33 MHz). The peripheral bay provides space for a 3.5-inch diskette drive and a CD-ROM drive and two other devices (hard-disk drives, tape drives).

The hard-disk drive bays provide space for up to six 1-inch SCSI hard-disk drives. These hard-disk drives are connected to a SCSI host adapter on the system board or on an expansion card, via the SCSI backplane board.

Power is supplied to the system board, SCSI backplane board, and internal peripherals via a single non-redundant power supply. There is an option for up to three

hot-pluggable redundant power supplies that are front loadable and slide into connectors mounted on the the PDB. When this option is installed, the PDB will provide power to the system board, SCSI backplane board, and internal peripherals.

For non-SCSI drives such as the diskette drive and CD-ROM drive, an interface cable connects the interposer board, attached to the diskette drive and CD-ROM drive, to the system board. For SCSI devices, interface cables connect externally accessible SCSI devices and the SCSI backplane board to a SCSI host adapter either on the system board or on an expansion card. (For more information, see "[Installing Drives](#)").

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

Responding to a Dell OpenManage Server Agent Alert Message

The optional Dell OpenManage™ Server Agent management application monitors critical system voltages and temperatures, the system cooling fans, and the status of the SCSI hard-disk drives in the system. The application generates alert messages that appear in the alert log window. For information about the alert log window and options, see the Dell OpenManage Server Agent documentation.

Troubleshooting a Wet System

Problem

- 1 Liquid spills
- 1 Splashes
- 1 Excessive humidity

Action

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover.
3. Remove all expansion cards installed in the system.
4. Let the system dry thoroughly for at least 24 hours.
5. Replace the system cover, reconnect the system to the electrical outlet, and turn on the system.

If the system does not start up properly, see "[Getting Help](#)," for instructions on obtaining technical assistance.

6. If the system starts up normally, shut down the system and reinstall all expansion cards you removed in step 3.
7. Run the system board tests in the Dell Diagnostics to confirm that the system is working properly.

If the tests did not complete successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting a Damaged System

Problem

- 1 System dropped or damaged

Action

1. Check the following connections:
 - 1 Expansion-card connections to the system board
 - 1 Drive carrier connections to the SCSI backplane board
2. Make sure that all cables are properly connected and that all components are properly seated in their connectors and sockets.
3. Run the system board tests in the Dell Diagnostics.

If the tests did not complete successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting the System Battery

Problem

- 1 Error message shows problem with the battery
- 1 System setup program loses the system configuration information
- 1 System date and time will not stay current

Action

1. Check the connection of the coin cell battery to the system board.

See "[Replacing the System Battery](#)" in "Installing System Board Options."

▲ WARNING: 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.

2. If the problem is not resolved by reseating the battery, replace the battery.

If the problem is not resolved by replacing the battery, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting Redundant Power Supplies

Problem

- 1 Amber *fault indicator* on the system front panel lights up
- 1 Red *fault indicator* blinks on the power supply or is lit up continuously

Action

1. Open the front bezel.

See "[Removing the Front Bezel](#)."

▲ CAUTION: The power supplies are hot-pluggable. The system requires two power supplies to be installed for the system to operate normally. The system is in the redundant mode when all three power supplies are installed. Remove and replace only one power supply at a time.

2. While grasping the power supply handle, push down on the release lever and pull the power supply straight out to clear the chassis.
 3. Slide the new power supply into the chassis.
-

Troubleshooting a Cooling Fan

Problem

- 1 Amber *fault indicator* on the system front bezel lights up
- 1 Server management application program issues a fan-related error message

Action

1. Open the front bezel.

See "[Removing the Front Bezel](#)."

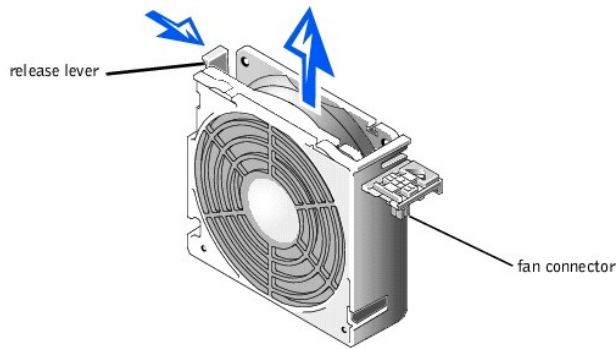
2. Remove the system cover.

🔧 NOTE: There are two fan assemblies containing two individual fans. One assembly is located near the SCSI backplane board. The other fan assembly is attached to the back-panel.

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

3. Locate the faulty fan and while pressing the release lever, grasp the fan and lift straight up to clear the fan assembly (see [Figure 5-6](#)).

Figure 5-6. Removing a Cooling Fan



4. Reseat the fan in its compartment.
Ensure that the fan connector is firmly seated.
 5. If the problem is not resolved, insert a replacement cooling fan.
 6. If the replacement fan does not operate, one of the fan bay connectors is faulty.
See "[Getting Help](#)," for information on obtaining technical assistance.
-

Troubleshooting Expansion Cards

Problem

- 1 Error message indicates an expansion-card problem
- 1 Expansion card seems to perform incorrectly or not at all

Action

1. Turn off the system and disconnect the system from its electrical outlet.
2. Open the front bezel.
See "[Removing the Front Bezel](#)."
3. Remove the system cover.
4. Verify that each expansion card is firmly seated in its connector.
5. Verify that any appropriate cables are firmly connected to their corresponding connectors on the expansion cards.
6. Install the system cover.
7. Connect the system to an electrical outlet and turn on the system. If the problem still exists, go to step 8.
8. Turn off the system and disconnect the system from its electrical outlet.
9. Remove the system cover.
10. Remove all expansion cards installed in the system.
11. Install the system cover.
12. Connect the system to an electrical outlet and turn on the system.
13. Run the system memory tests in the Dell Diagnostics.
If the tests do not complete successfully, see "[Getting Help](#)," for information on obtaining technical assistance.
14. Reinstall one of the expansion cards you removed in step 5 and repeat step 6.

Repeat steps 8 and 9, and steps 11 through 13.

15. Repeat step 14 for each of the remaining expansion cards.

If you have reinstalled all of the expansion cards and the system memory tests are still failing, see "[Getting Help](#)," for information on obtaining technical assistance.

Troubleshooting System Memory

Problem

1. Faulty memory module
1. Faulty system board

Action

1. Turn on the power to the system, including any attached peripherals.


If there is not an error message, go to step 8.

2. Enter the System Setup program to check the system memory setting.

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

3. If the amount of memory installed does not match the system memory setting, go to step 9.

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

 **CAUTION:** See "**Protecting Against Electrostatic Discharge**" in the safety instructions in your *System Information* document.

5. Remove the system cover.

6. Remove the cooling shroud (see "[Removing the Cooling Shroud](#)" in "Installing System Board Options").

7. Reseat the memory modules in their sockets.

8. Install the cooling shroud (see "[Installing the Cooling Shroud](#)" in "Installing System Board Options").

9. Replace the system cover, reconnect the system to power, and turn on the system.

10. Enter the System Setup program and check the system memory again.

11. Does the amount of memory installed match the system memory?

If the amount of memory installed does not match the system memory setting, continue to step 13.

12. Reboot the system, and observe the monitor screen and the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard.

If the monitor screen does remain blank, and the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard remain on, continue to step 13.

If the monitor screen does not remain blank, and the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard remain on, continue to step 18.

13. Repeat steps 4 through 6.

 **NOTE:** There are multiple configurations for the memory modules; see "[Memory Module Installation Guidelines](#)" in "Installing System Board Options." The following steps are an example of one configuration.

14. Swap the memory module pair in bank 1 (DIMM_A and DIMM_B) with one of the same capacity.

15. Replace the system cover and reconnect the system to an electrical outlet.

16. Reboot the system, and observe the monitor screen and the indicators on the keyboard.

17. If the problem still exists, repeat steps 14 through 16 for each memory module pair installed.

If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.

18. Run the system memory test in the Dell Diagnostics.

If the test does not complete successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting the Video Subsystem

Problem

- 1 Monitor not operating
- 1 Monitor interface cable not connected correctly or is faulty
- 1 Video logic problems

Action

1. Check the system and power connections to the monitor.
2. Run the video tests in the Dell Diagnostics.

If the tests run successfully, the problem is not related to video hardware. See "[Finding Software Solutions](#)."

If the tests did not run successfully see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting the System Board

Problem

- 1 Error message indicating a system board problem

Action

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. Open the front bezel.

See "[Removing the Front Bezel](#)."

3. Remove the system cover.
4. Remove all expansion cards except the SCSI host adapter card for the boot drive.
5. Replace the system cover, reconnect the system to power, and turn on the system.
6. Run the system board tests in the Dell Diagnostics.

If the tests does not run successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

7. Turn off the system, disconnect it from power, and remove the system cover.
8. Reinstall one of the expansion cards that you removed in step 4.
9. Replace the system cover, reconnect the system to power, and turn on the system.
10. Run the system board tests again.

Did the tests run successfully?

If the tests does not complete successfully, see "[Getting Help](#)," for instructions on obtaining technical assistance.

11. Repeat steps 8 through 10 for the remaining expansion cards that you removed in step 4.

If you have reinstalled all of the expansion cards and the problem still persists, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting the Diskette Drive

Problem

- 1 Error message indicating a diskette drive problem during execution of either the boot routine or the Dell Diagnostics

Action

1. Enter the system setup program, and verify that the system is configured correctly. See "Using the System Setup Program" in the *User's Guide* for instructions.
2. Run the diskette drive tests in the Dell Diagnostics to see whether the diskette drive now works correctly.
3. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
4. Verify that the diskette/CD-ROM drive interface cable is securely connected between the interposer board on the diskette/CD-ROM drive assembly and the system board.
5. Connect the system to its electrical outlet and turn on the system, including any attached peripherals.
6. Run the diskette drive tests in the Dell Diagnostics to determine whether the diskette drive works correctly.
7. If the drive still does not work, remove all expansion cards.
8. Run the diskette drive tests in the Dell Diagnostics to determine whether the diskette drive now works correctly.

If the test ran successfully, an expansion card may be conflicting with the diskette drive logic, or you may have a faulty expansion card. Continue to step 9.

If the test failed, see "[Getting Help](#)," for instructions on obtaining technical assistance.

9. Reinstall one of the expansion cards you removed in step 7.
10. Retest and run the diskette drives test in the Dell Diagnostics to determine whether the diskette drive subsystem now works correctly.
11. Repeat steps 9 and 10 until all expansion cards have been reinstalled or until one of the expansion cards prevents the system from booting from the diagnostics diskette.

If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting a CD-ROM Drive

Problem

- 1 System cannot read data from CD
- 1 CD-ROM indicator fails to flash during boot

Action

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. Open the front bezel.

See "[Removing the Front Bezel](#)."
3. Remove the system cover.
4. Verify that the diskette/CD-ROM drive interface cable is securely connected between the interposer board on the diskette/CD-ROM drive assembly and the system board.
5. Connect the system to its electrical outlet and turn on the system, including any attached peripherals.
6. Run the IDE devices tests in the Dell Diagnostics to determine whether the CD-ROM drive now works correctly.

If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting an External SCSI Tape Drive

Problem

- 1 Defective tape drive
- 1 Defective tape cartridge
- 1 Software or device driver
- 1 Defective SCSI host adapter

- 1 Tape drive online indicator fails to light after operating system installs

Action

1. Remove the tape that was in use when the problem occurred and replace it with a tape that you know is not defective.
 2. Verify that any required SCSI device drivers are installed on the hard-disk drive and are configured correctly.
 3. See "Using the Dell OpenManage Server Assistant CD" in the *User's Guide* for instructions on installing and configuring device drivers for the system's integrated SCSI host adapter or Dell host adapter card.
 4. For any other type of SCSI host adapter card, see the documentation that accompanied the SCSI host adapter card.
 5. Reinstall the tape backup software as instructed in the tape-backup software documentation.
 6. Check the external cable connections to the drive.
 - a. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
 - b. Check the SCSI cable connection to the host adapter card and the SCSI tape drive. Check the DC power cable connection to the tape drive.
 - c. Verify that the tape drive is configured for a unique SCSI ID number and that the tape drive is terminated or not terminated as appropriate.


See the documentation for the tape drive for instructions on selecting the SCSI ID and enabling or disabling termination.
 - d. Reconfigure the tape drive's SCSI ID and termination settings as appropriate. Reinstall the tape drive and reconnect the system to the electrical outlet. Turn on the system.
 - e. Replace the SCSI cable that connects the tape drive to the SCSI host adapter. Reconnect the system to the electrical outlet and apply power.
 7. If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.
-

Troubleshooting Hard-Disk Drives


Problem

- 1 The drive itself
- 1 SCSI backplane board
- 1 SCSI cable connections to the system board
- 1 Systems using an optional Dell host adapter card issue the following signals by using the drive indicator lights adjacent to each hard-disk drive:
 - o *Hard drive failure indicator* on the control panel lights
 - o If a drive shows signs of imminent failure, the *drive online indicator* stays on and the drive failure indicator blinks on briefly each second.
 - o If a drive has failed, the *drive online indicator* turns off and the *drive failure indicator* blinks on briefly each second.

Action

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


1. If the integrated SCSI host adapter is being used to control the SCSI backplane board, reboot the system and press <Ctrl><q> to enter the SCSI configuration utility program.

 **NOTE:** If your system has a Dell PERC 3 installed, reboot the system and press <Ctrl><h>. See the documentation supplied with the controller for information on the configuration utility.
2. Check that the primary SCSI channel is enabled, and reboot the system.
3. Verify that the device drivers are installed and configured correctly.

See the documentation for the system's operating system.
4. Remove the drive carrier and install it in the another drive bay.
5. If the problem is resolved, the SCSI backplane board has a defective connector. See "[Getting Help](#)," for instructions on obtaining technical assistance.

6. Check the SCSI cable connections inside the system:
 - a. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
 - b. Remove the system cover.
 - c. Check the SCSI cable connection to the SCSI host adapter.

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

 **NOTE:** If the SCSI cable is connected to the SCSI channel A only, all six hard-disk drives are controlled. If both SCSI channels A and B are connected, the SCSI channel A controller controls hard-disk drives 0 through 2 (SCSI ID 0-2) and the SCSI channel B controller controls hard-disk drives 3 through 5 (SCSI ID 3-5).

7. Partition and logically format the hard-disk drive. If possible, restore the files to the drive.

To partition and logically format the drive, see the documentation for the system's operating system.

8. If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.
-

Troubleshooting an Integrated RAID Controller

Problem

1. Error message indicating an integrated RAID controller problem.


Action

1. Enter the System Setup program and check the setting for the integrated RAID controller.

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

If the controller is enabled, go to step 8.

2. Change the RAID controller setting to **Enabled**, and then reboot the system.
3. See the documentation provided with the RAID controller software and check the software settings.

 **WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)."**

4. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
5. Open the front bezel (see "[Removing the Front Bezel](#)").
6. Remove the system cover.
7. Remove the cooling shroud.
8. Reseat the RAID memory module in its socket.

See "[Adding Memory](#)" in "Installing System Board Options" for general instructions on removing and replacing DIMMs.

9. Reseat the RAID hardware key in its socket.
See [Figure 6-1](#) for the location of the RAID hardware key.
10. Replace the RAID backup battery.
11. Replace the cooling shroud and system cover, reconnect the system to the electrical outlet, and reboot the system.

If the problem is not resolved, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Troubleshooting a RAID Controller Card

Your system may contain an optional RAID controller card. If you encounter problems with a controller, see the RAID controller's documentation for detailed information on troubleshooting the RAID controller.

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Installing System Board Options

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Removing and Replacing Fan Assemblies](#)
 - [Expansion Cards](#)
 - [Removing and Installing the Cooling Shroud](#)
 - [Removing and Installing a Power Supply](#)
- [Adding Memory](#)
 - [Microprocessor Upgrades](#)
 - [Activating the Integrated RAID Controller](#)
 - [Replacing the System Battery](#)

This section describes how to install the following options:

- 1 Expansion cards
- 1 Memory upgrades
- 1 Microprocessor upgrades
- 1 Integrated RAID controller

This section also includes instructions for replacing the fan assemblies, cooling shroud, power supplies, RAID battery, and system battery, if necessary.

Use [Figure 6-1](#) to locate the system board features. [Table 6-1](#) describes the system board connectors and sockets.

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)" in "Troubleshooting Your System."

Figure 6-1. System Board Features

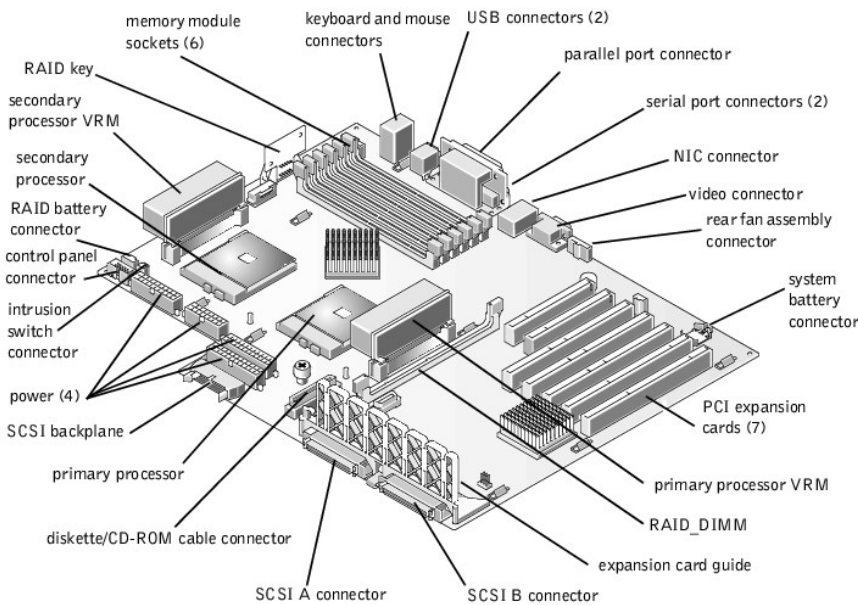


Table 6-1. System Board Connectors and Sockets

Connector or Socket	Description
SCSI BACKPLANE	Hot-pluggable SCSI backplane board interface cable connector
RAID BAT	RAID battery connector
BATTERY	System battery connector
COM n	Serial port connectors; sometimes referred to as COM1 and COM2

DIMM_x	Memory module sockets (A–F)
DIMM_RAID	Memory module socket for integrated RAID controller
ENET	Ethernet connector
REAR_FAN	Power for the rear fan assembly
FLOPPY/IDE	Power and data to the diskette/CD ROM interposer board from the system board
INTR	Intrusion-alarm switch connectors
KYBD	Keyboard connector
MOUSE	Mouse connector
FRONT_PANEL	System control panel connector
PARALLEL	Parallel port connector; sometimes referred to as LPT1
POWER_n	Power connector
PROCESSOR_n	Microprocessor sockets
PROCESSOR_n VRM	Voltage regulator module connector
RAID_KEY	Socket for integrated RAID controller hardware key
SLOT_n	Expansion card connectors (SLOT_1—SLOT_7)
SCSIA, SCSIB	Ultra160/m SCSI host adapter connectors
USB_n	USB connector
VGA	Video connector
NOTE: For the full name of an abbreviation or acronym used in this table, see "Abbreviations and Acronyms."	

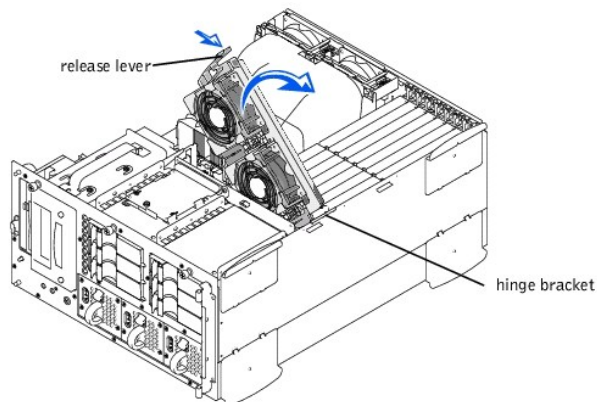
Removing and Replacing Fan Assemblies

There are two fan assemblies containing two individual fans. One assembly is located near the SCSI backplane board. The other fan assembly is attached to the back-panel.

Removing the Front Fan Assembly

1. Open the front bezel (see ["Removing the Front Bezel"](#) in "Troubleshooting Your System").
2. Remove the system cover.
3. Release the fan assembly by pressing the release lever (see [Figure 6-2](#)).

Figure 6-2. Removing the Front Fan Assembly



4. Swing the fan assembly up and out of the way.
5. Disconnect the fan assembly power cable from the front fan connector on the SCSI backplane board (see [Figure A-3](#)).

Replacing the Front Fan Assembly

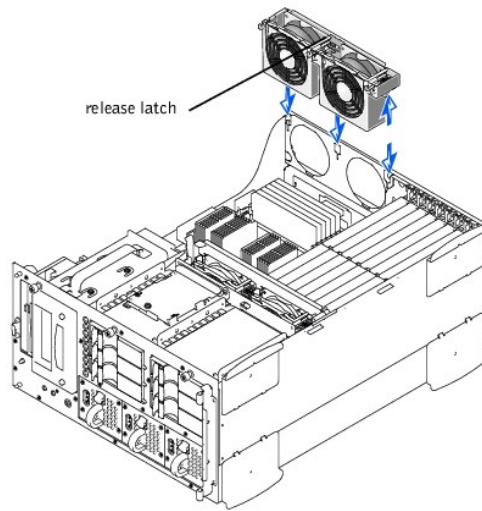
1. Connect the fan assembly power cable to the front fan connector on the SCSI backplane board (see [Figure A-3](#)).

2. Place the fan assembly in the hinge bracket and swing the fan assembly down until the release lever snaps into place.
3. Replace the system cover.
4. Close the front bezel.

Removing the Back Fan Assembly

1. Open the front bezel (see ["Removing the Front Bezel"](#) in "Troubleshooting Your System").
2. Remove the system cover.
3. Remove the cooling shroud (see ["Removing the Cooling Shroud"](#)).
4. Press the release latch and lift the fan assembly straight up to clear the chassis (see [Figure 6-3](#)).

Figure 6-3. Removing the Back Fan Assembly



5. Disconnect the fan assembly power cable from the fan connector (REAR FAN) on the system board (see [Figure 6-1](#)).

Replacing the Back Fan Assembly

1. Connect the fan assembly power cable to the fan connector (REAR FAN) on the system board (see [Figure 6-1](#)).
2. Align the fan assembly with the fan assembly guide on the back-panel, and push down until the fan assembly is firmly seated and the latch is engaged (see [Figure 6-3](#)).
3. Install the cooling shroud (see ["Installing the Cooling Shroud"](#)).
4. Replace the system cover.
5. Close the front bezel.

Removing and Replacing Individual Fans

There are four fans contained in two fan assemblies. The procedure for removing and replacing the four fans are the same.

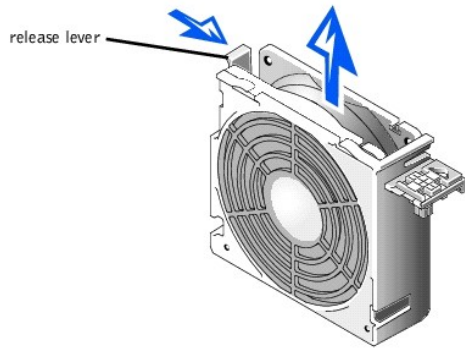
To remove a fan:

1. Open the front bezel (see ["Removing the Front Bezel"](#) in "Troubleshooting Your System").
2. Remove the system cover.

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

3. Locate the faulty fan and while pressing the fan release lever, lift the fan straight up to clear the fan assembly (see [Figure 6-4](#)).

Figure 6-4. Removing/Replacing a Fan



To replace a fan:

1. Lower the fan into the fan assembly until the fan snaps into position.
2. Replace the system cover.
3. Close the front bezel.

Expansion Cards

Expansion cards are installed on the system board (see [Figure 6-1](#)). There are seven expansion card slots available.

The front fan assembly bracket is used to help secure the expansion cards.

Installing an Expansion Card

To install an expansion card, perform the following steps.

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First— For You and Your System](#)" in "Troubleshooting Your System."

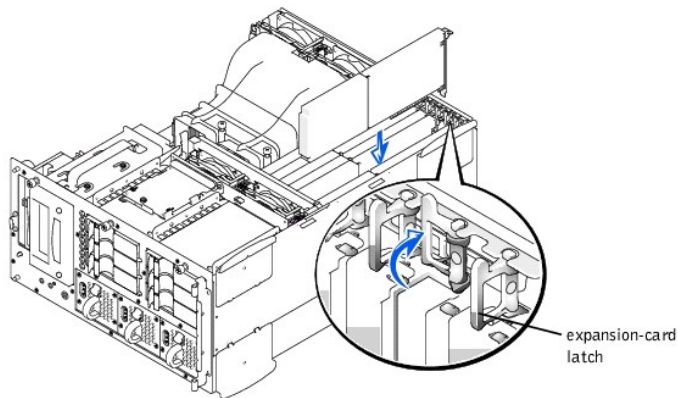
1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
3. Remove the system cover.

▲ CAUTION: See "[Protecting Against Electrostatic Discharge](#)" in the safety instructions in your *System Information* document.

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

4. Remove the front fan assembly (see "[Removing the Front Fan Assembly](#)").
5. Release the expansion-card latch, and remove the filler bracket from the expansion slot (see [Figure 6-5](#)).
6. Install the new expansion card (see [Figure 6-5](#)).
7. Position the expansion-card so that the board-edge connector aligns with the expansion-card connector on the system board.
8. Insert the card-edge connector firmly into the expansion-card connector until the card is fully seated.

Figure 6-5. Installing an Expansion Card



9. When the card is seated in the connector and the card-mounting bracket is aligned with the brackets on either side of it, close the expansion-card latch.

NOTE: SCSI cables connected from an expansion card to the SCSI backplane board should be routed under the front fan assembly.

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

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

11. Replace the front fan assembly (see ["Replacing the Front Fan Assembly"](#)).
12. Replace the system cover, and then reconnect the system and peripherals to their power sources and turn on the system.
13. Close the front bezel.

Removing an Expansion Card

WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see ["Safety First—For You and Your System"](#) in ["Troubleshooting Your System."](#)

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the front bezel (see ["Removing the Front Bezel"](#) in ["Troubleshooting Your System"](#)).
3. Remove the system cover.
4. Remove the front fan assembly (see ["Removing the Front Fan Assembly"](#)).
5. Disconnect any cables connected to the card.
6. To release the expansion card from the system, rotate the latch away from the expansion-card bracket (see [Figure 6-5](#)).
7. Grasp the expansion card by its top corners, and carefully remove it from the expansion-card connector.
8. If you are removing the card permanently, install a metal filler bracket over the empty card-slot opening.

NOTE: Installing a filler bracket over an empty expansion slot is necessary 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.

9. Replace the front fan assembly (see ["Replacing the Front Fan Assembly"](#)).
10. Replace the system cover, and then reconnect the system and peripherals to their power sources and turn on the system.
11. Close the front bezel.

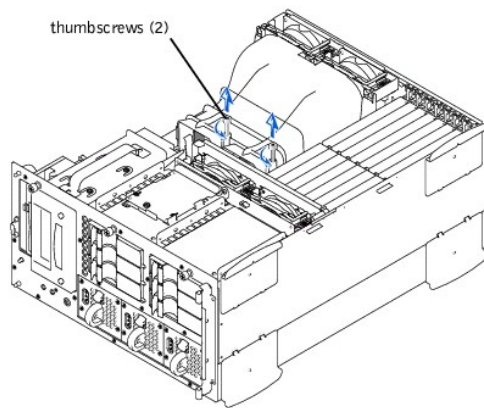
Removing and Installing the Cooling Shroud

Removing the Cooling Shroud

1. Open the front bezel (see ["Removing the Front Bezel"](#) in ["Troubleshooting Your System"](#)).
2. Remove the system cover.

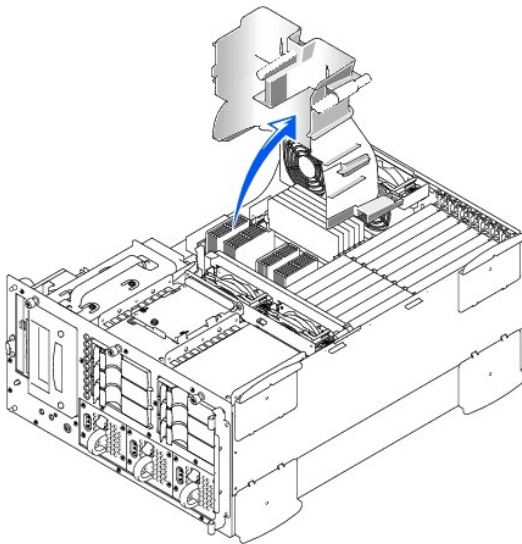
3. Loosen the two thumbscrews securing the cooling shroud to the system (see [Figure 6-6](#)).

Figure 6-6. Removing and Installing the Cooling Shroud



4. Rotate the cooling shroud up and lift to clear the rear cooling fan assembly and chassis (see [Figure 6-7](#)).

Figure 6-7. Rotating the Cooling Shroud



Installing the Cooling Shroud

1. Lower the cooling shroud into the chassis ensuring that the cooling shroud is aligned with the rear cooling fan assembly guides.
2. Rotate the cooling shroud down ensuring the thumbscrews are aligned with the connecting posts on the system board (see [Figure 6-6](#)).
3. Tighten the two thumbscrews securing the cooling shroud to the system board.
4. Replace the system cover.
5. Close the front bezel.

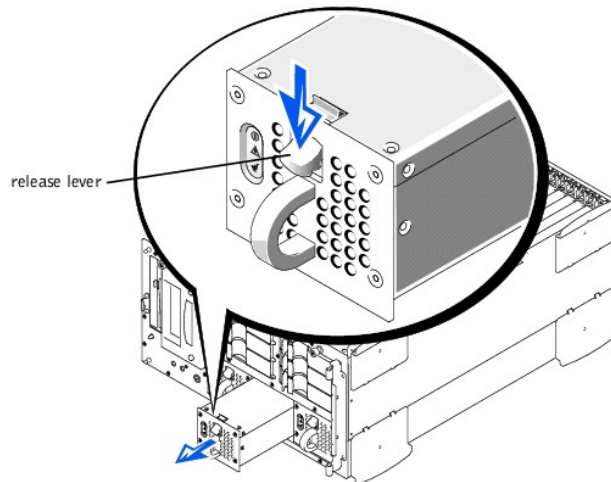
Removing and Installing a Power Supply

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").

⚠ CAUTION: The power supplies are hot-pluggable. The system requires two power supplies to be installed for the system to operate normally. The system is in the redundant mode when all three power supplies are installed. Remove and replace only one power supply at a time.

2. Remove the power supply by grasping the power supply handle, pressing down on the release lever, and pulling the power supply straight out to clear the chassis (see [Figure 6-8](#)).

Figure 6-8. Removing and Installing the Power Supply



3. Install the power supply by sliding the new power supply into the chassis until it snaps into place.
4. Close the front bezel.

Adding Memory

The six memory module sockets on the system board can accommodate 128 MB to 4 GB of registered SDRAM. The memory module sockets are arranged in pairs which consist of three banks (Bank 1– Bank 3). These banks are located near the back edge of the system board (see [Figure 6-1](#)), next to the cooling fan assembly.

Memory Upgrade Kits

The system is upgradable to 4 GB by installing combinations of 64-, 128-, 256-, 512-MB, and 1 GB registered memory modules. If you receive an error message stating that maximum memory has been exceeded, see "[Indicators, Messages, and Codes](#)," for detailed information. You can purchase memory upgrade kits from Dell as needed.

NOTE: The memory modules must be PC-133 compliant.

Memory Module Installation Guidelines

Starting with the socket nearest the fans, the memory module sockets are labeled "DIMM_A" through "DIMM_F" (see [Figure 6-9](#)). When you install memory modules, follow these guidelines:

- 1 You must install memory modules in matched pairs.
- 1 Install a pair of memory modules in socket DIMM_A and DIMM_B before installing a second pair in sockets DIMM_C and DIMM_D.

Figure 6-9. Memory Module Sockets

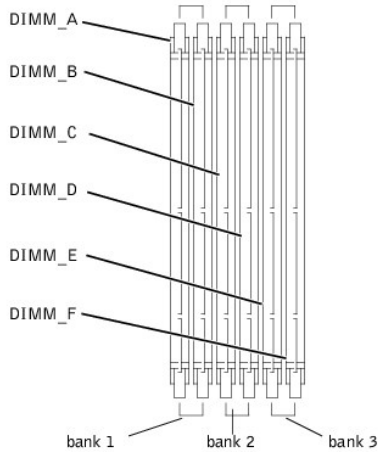


Table 6-2 illustrates several sample memory configurations based on these guidelines.

Table 6-2. Sample Memory Module Configurations

Total Desired Memory						
	DIMM_A	DIMM_B	DIMM_C	DIMM_D	DIMM_E	DIMM_F
128 MB	64 MB	64 MB	None	None	None	None
256 MB	128 MB	128 MB	None	None	None	None
512 MB	256 MB	256 MB	None	None	None	None
512 MB	128 MB	128 MB	128 MB	128 MB	None	None
1 GB	256 MB	256 MB	256 MB	256 MB	None	None
1.5 GB	256 MB	256 MB	256 MB	256 MB	256 MB	256 MB
2 GB	512 MB	512 MB	512 MB	512 MB	None	None
3 GB	512 MB	512 MB	512 MB	512 MB	512 MB	512 MB
4 GB	1 GB	1 GB	1 GB	1 GB	None	None

Performing a Memory Upgrade

⚠ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First— For You and Your System](#)" in "Troubleshooting Your System."

⚠ CAUTION: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
2. Remove the system cover.
3. Remove the cooling shroud (see "[Removing the Cooling Shroud](#)").
4. Locate the memory module sockets in which you will install or replace memory module pairs. [Figure 6-9](#) shows the order of the memory module sockets.
5. Install or replace the memory module pairs as necessary to reach the desired memory total (see "[Installing Memory Modules](#)" or "[Removing Memory Modules](#)").
6. Install the cooling shroud (see "[Installing the Cooling Shroud](#)").
7. Replace the system cover, reconnect the system to the electrical outlet, and turn on system. After the system completes the POST routine, it runs a memory test.

The system detects that the new memory does not match the system configuration information, which is stored in NVRAM. The monitor displays an error message that ends with the following words:

Press <F1> to continue; <F2> to enter System Setup

8. Press <F2> to enter the System Setup program, and check the **System Memory** setting in the system data box on the System Setup screens. The system should have already changed the value in the **System Memory** setting to reflect the newly installed memory.
9. If the **System Memory** value is incorrect, one or more of the memory modules may not be installed properly. Repeat steps 1 through 5 again, checking to make sure that the memory modules are firmly seated in their sockets.
10. Run the system memory test in the Dell Diagnostics.
11. Close the front bezel.

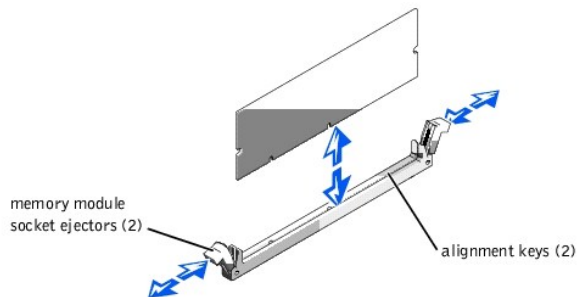
Installing Memory Modules

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First— For You and Your System](#)" in "Troubleshooting Your System."

▲ CAUTION: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
2. Remove the system cover.
3. Remove the cooling shroud (see "[Removing the Cooling Shroud](#)").
4. Locate the memory module sockets in which you will install a memory module. [Figure 6-9](#) shows the order of the memory module sockets.
5. Press down and outward on the ejectors on the memory module socket, as shown in [Figure 6-10](#), to allow the memory module to be inserted into the socket.

Figure 6-10. Installing a Memory Module



6. Align the memory module's edge connector with the alignment keys of the memory module socket, and insert the memory module in the socket (see [Figure 6-10](#)).

The memory module socket has two alignment keys that allow the memory module to be installed in the socket in only one way.

7. 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 (see [Figure 6-10](#)).
8. When the memory module is properly seated in the socket, the ejectors on the memory module socket should align with the ejectors on the other sockets with memory modules installed.
9. Repeat steps 5 through 7 of this procedure to install the remaining memory modules.
10. Perform steps 6 through 9 of "[Performing a Memory Upgrade](#)."

Removing Memory Modules

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First— For You and Your System](#)" in "Troubleshooting Your System."

▲ CAUTION: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

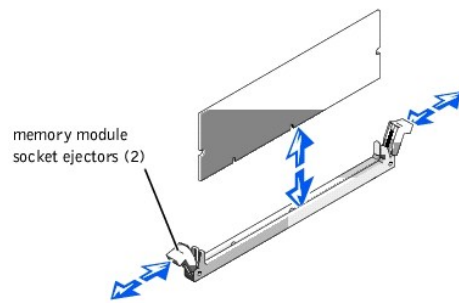
1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").

2. Remove the system cover.
3. Remove the cooling shroud (see "[Removing the Cooling Shroud](#)").
4. Locate the memory module sockets in which you will remove memory modules.

[Figure 6-9](#) shows the order of the memory module sockets.

5. Press down and outward on the ejectors on each end of the socket until the memory module pops out of the socket (see [Figure 6-11](#)).

Figure 6-11. Removing a Memory Module



Microprocessor Upgrades

To take advantage of future options in speed and functionality, you can add a second processor or replace either the primary or secondary processor.

🔔 **NOTICE:** The second processor must be of the same type and speed as the first processor.

Each processor and its associated L2 cache memory are contained in a PGA package that is installed in a ZIF socket on the system board. The following subsection describes how to install or replace the microprocessor in either the primary or secondary processor socket.

Adding or Replacing a Microprocessor

In addition to the ZIF socket for the primary microprocessor on the system board, there is a second ZIF socket to accommodate a secondary microprocessor. The secondary micro-processor must have the same operating frequency as the primary micro-processor. For example, if the system has a 933-MHz primary microprocessor, your secondary microprocessor must also be a 933-MHz microprocessor.

In a single microprocessor system, the microprocessor must be installed in the primary ZIF socket.

The following items are included in the microprocessor upgrade kit:

- 1 A microprocessor chip
- 1 A heat sink
- 1 A securing clip
- 1 A VRM, if adding a second processor

🔧 **NOTE:** Dell recommends that only a technically knowledgeable person perform this procedure.

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
2. Remove the system cover.
3. Remove the cooling shroud (see "[Removing the Cooling Shroud](#)").

⚠️ **CAUTION:** See "[Protecting Against Electrostatic Discharge](#)" in the safety instructions in your System Information document.

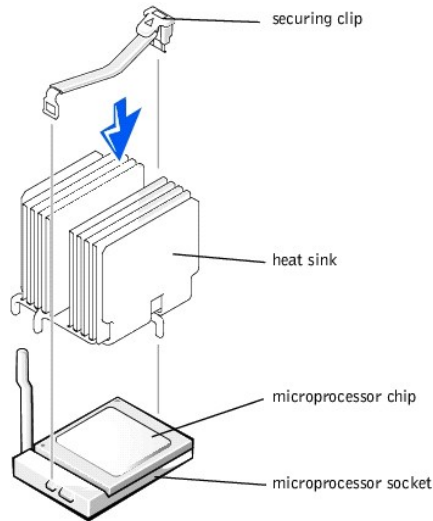
4. Press down on the heat-sink securing clip to release the clip from the retaining tab on the ZIF socket (see [Figure 6-12](#)).
5. Remove the securing clip.

⚠️ **CAUTION:** Never remove the heat sink from a microprocessor unless you intend to remove the microprocessor. The heat sink is necessary to

maintain proper thermal conditions.

▲ WARNING: The microprocessor chip and heat sink can become extremely hot. Be sure the microprocessor has had sufficient time to cool before handling.

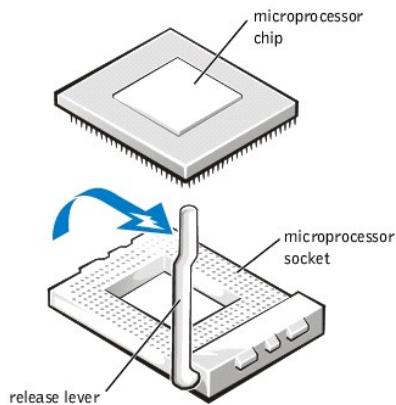
Figure 6-12. Securing Clip



6. Remove the heat sink.
7. Pull the socket release lever straight up until the microprocessor is released (see [Figure 6-13](#)).
8. Lift the microprocessor out of the socket and leave the release lever up so that the socket is ready for the new microprocessor.

▲ CAUTION: Be careful not to bend any of the pins when removing the microprocessor chip. Bending the pins can permanently damage the microprocessor chip.

Figure 6-13. Removing the Microprocessor



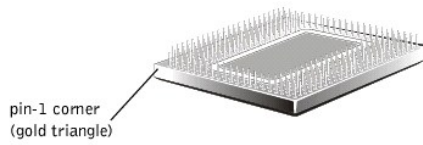
9. Unpack the new microprocessor.
If any of the pins on the microprocessor appear bent, see "[Getting Help](#)," for instructions on obtaining technical assistance from Dell.
10. Align the pin-1 corner of the microprocessor (see [Figure 6-14](#)) with the pin-1 corner of the microprocessor socket.

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

Identify the pin-1 corner of the microprocessor by locating the tiny gold triangle that extends from one corner of the large central rectangular area. The gold

triangle points toward pin 1, which is also uniquely identified by a square pad.

Figure 6-14. Pin-1 Identification



11. Install the microprocessor in the socket (see [Figure 6-15](#)).

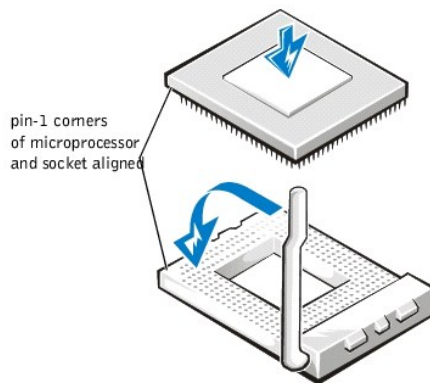
⚠ CAUTION: Positioning the microprocessor incorrectly can permanently damage the microprocessor and the system when you turn on the system. When placing the microprocessor in the socket, be sure that all of the pins on the microprocessor go into the corresponding holes. Be careful not to bend the pins.

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

With the pin-1 corners of the microprocessor and socket aligned, set the microprocessor lightly in the socket and make sure all pins are matched with the correct holes in the socket. Because the system uses a ZIF micro-processor socket, there is no need to use force (which could bend the pins if the microprocessor is misaligned). When the microprocessor is positioned correctly, it should drop down into the socket with minimal pressure.

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

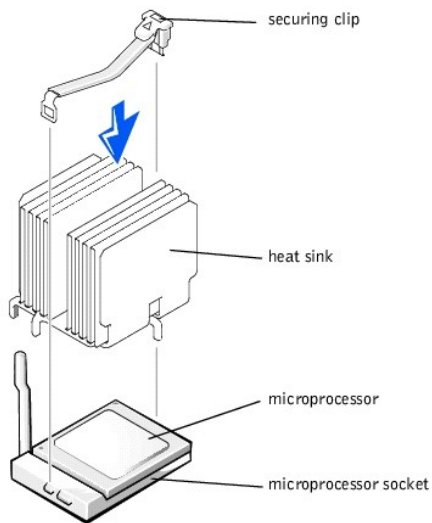
Figure 6-15. Installing the Microprocessor



12. Place the new heat sink on top of the microprocessor (see [Figure 6-16](#)).

13. Orient the securing clip as shown in [Figure 6-16](#).

Figure 6-16. Installing the Heat-Sink



14. Hook the end of the clip without the heat-sink latch to the tab on the edge of the socket facing the front of the system.

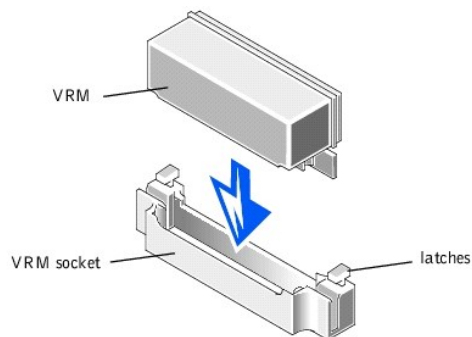
15. Push down and pivot the heat-sink latch until the hole on the clip latches onto the ZIF socket tab.

⚠ CAUTION: If you are installing a VRM, it must be a +12V VRM.

16. If you are adding a second microprocessor, place the VRM in the socket (see [Figure 6-17](#)).

17. Make sure that the latches engage.

Figure 6-17. Installing the VRM



18. Replace the cooling shroud (see "[Installing the Cooling Shroud](#)").

19. Replace the system cover making sure that the shroud support holds the shroud in place.

20. Close the front bezel.

21. Reconnect your system and peripherals to their power sources, and turn on system.

22. Press <F2> to enter the System Setup program, and check that the **PROCESSOR 1** and **PROCESSOR 2** categories match the new system configuration.

See the system *User's Guide* for instructions.

23. As the system boots, it detects the presence of the new processor and automatically changes the system configuration information in the System Setup program. If you installed a second microprocessor, the following message is displayed:

```
Two 933 MHz Processors, Processor Bus: 133 MHz, L2 cache 256 KB Advanced
```

If only one processor is installed, the following message is displayed:

```
One 933 MHz Processor, Processor Bus: 133 MHz, L2 cache 256 KB Advanced
```

☒ **NOTE:** After you remove and replace the front bezel, the chassis intrusion detector will cause the following message to be displayed at the next system start-up:

ALERT! Bezel was previously removed.

24. Enter the System Setup program, and confirm that the top line in the system data area correctly identifies the installed processor(s). See "Using the System Setup Program" in your *User's Guide*.
25. While in the System Setup program, reset the chassis intrusion detector.

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

26. Run the Dell Diagnostics to verify that the new microprocessor is operating correctly. See "[Running the Dell™ Diagnostics](#)," for information on running the diagnostics and troubleshooting any problems that may occur.

Activating the Integrated RAID Controller

To activate the integrated PERC 3/Di, perform the following steps.

▲ **WARNING:** Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)" in "[Troubleshooting Your System](#)."

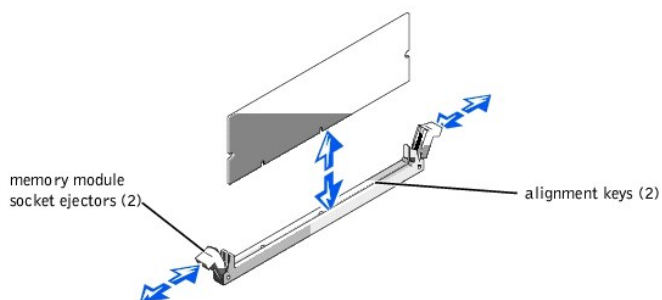
🔄 **NOTICE:** To avoid possible data loss, back up all data on the hard-disk drives before changing the mode of operation of the integrated SCSI controller from SCSI to RAID.

⚠ **CAUTION:** See "[Protecting Against Electrostatic Discharge](#)" in the safety instructions in your *System Information* document.

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "[Troubleshooting Your System](#)").
2. Remove the system cover.
3. Remove the cooling shroud.
4. Open the ejectors on the RAID controller memory module socket down and outward, as shown in [Figure 6-18](#), to allow the memory module to be inserted into the socket.

See [Figure 6-1](#) for the location of the socket on the system board.

Figure 6-18. Installing the RAID Controller Memory Module



5. Align the memory module's edge connector with the slot in the center of the memory module socket, and insert the memory module in the socket (see [Figure 6-18](#)).

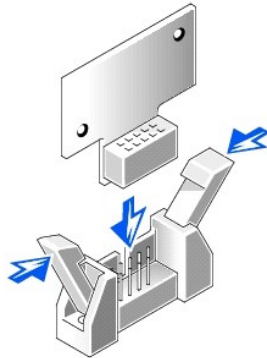
The memory module socket has two alignment keys that allow the memory module to be installed in the socket in only one way.

☒ **NOTE:** The RAID controller memory module must be an unbuffered memory module, rated to run at 100 MHz or faster. Do not substitute registered memory modules such as those used for system memory.

6. Press on the memory module with your thumbs while pulling on the ejectors with your index fingers to lock the memory module into the socket.
7. Install the RAID hardware key in its socket on the system board (see [Figure 6-1](#)).

Insert the hardware key into the socket and secure the key with the latches on each end of the socket (see [Figure 6-19](#)).

Figure 6-19. Installing the RAID Key



8. Install the RAID battery (see "[Installing the RAID Battery](#)").
9. Replace the cooling shroud and system cover; reconnect the system and peripherals to their power sources and turn them on.
10. Install the RAID software.

For details, see the RAID controller documentation.

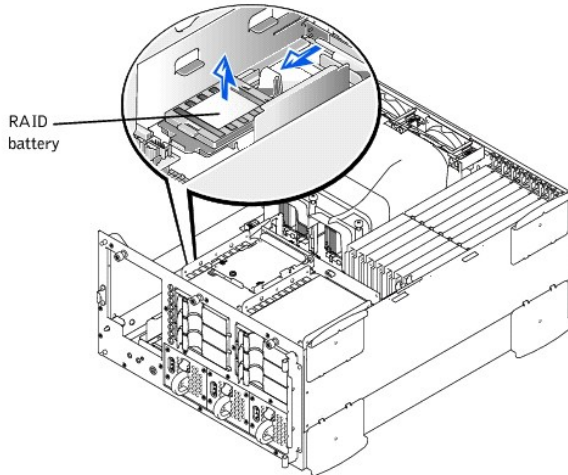
Installing the RAID Battery

1. Hook the front edge of the battery assembly into the slot in the bay, then snap the back edge of the battery assembly into place so the battery lies flat in the bay (see [Figure 6-20](#)).
2. Connect the battery cable to the RAID battery connector (RAID_BTRY) on the system board (see [Figure 6-1](#)).
3. Install the peripheral bay (see "[Installing the Peripheral Bay](#)").

Removing the RAID Battery

1. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
2. Remove the system cover.
3. Remove the peripheral bay (see "[Removing the Peripheral Bay](#)").
4. Disconnect the battery cable from the RAID battery connector (RAID_BTRY) on the system board (see [Figure 6-1](#)).
5. Press the release clip on the RAID battery and lift straight up to clear the system (see [Figure 6-20](#)).

Figure 6-20. Removing and Installing the RAID Battery



Replacing the System Battery

The system battery maintains system 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 on most of the time, the battery gets little use and thus lasts longer). You may need to replace the battery if an incorrect time or date is displayed during the boot routine along with the following or similar message:

```
Time-of-day not set -- please run SETUP program  
Strike the F1 key to continue, F2 to run the setup utility
```

or

```
System CMOS checksum bad -- Run SETUP  
Strike the F1 key to continue, F2 to run the setup utility
```

or

```
Invalid configuration information -- please run SETUP program  
Strike the F1 key to continue, F2 to run the setup utility
```

To determine if the battery needs replacing:

1. Reenter the time and date through the System Setup program.
2. Turn off and disconnect the system from the electrical outlet for a few hours.
3. Reconnect and turn the system on again.
4. Enter the System Setup program.

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

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

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

You can operate the system without a battery; however, the system configuration information maintained by the battery in NVRAM is erased each time you shut down the system. Therefore, you must reenter 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), coin-cell battery. To remove the battery, perform the following steps.

WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First— For You and Your System](#)" in "Troubleshooting Your System."

WARNING: 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.

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

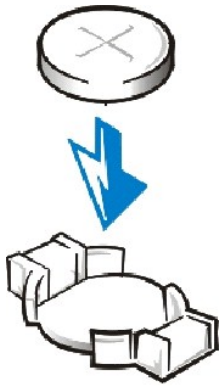
See "Using the System Setup Program," in the *User's Guide* for instructions.

2. Shut down the system, including any attached peripherals, and disconnect the system from the electrical outlet.

⚠ CAUTION: See "**Protecting Against Electrostatic Discharge**" in the safety instructions in your *System Information* document.

3. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
4. Remove the system cover.
5. Remove the battery (see [Figure 6-1](#), for the battery location).
6. Pry the battery out of its socket with your fingers or with a blunt, nonconductive object such as a plastic screwdriver.
7. Install the new battery with the side labeled "+" facing up (see [Figure 6-21](#)).

Figure 6-21. Installing the Battery



8. Replace the system cover, and then reconnect the system and peripherals to their power sources and turn on the system power.
9. Enter the System Setup program to confirm that the battery is operating properly.
10. Enter the correct time and date through the System Setup program's **Time** and **Date** settings.

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

11. To test the newly installed battery, power down and disconnect the system from the electrical source for at least an hour.
12. Close the front bezel.
13. After an hour, connect the system to an electrical source and turn on the power.
14. Enter the System Setup program and if the time and date are still incorrect, see "[Getting Help](#)," for instructions on obtaining technical assistance.

Installing Drives

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

- [Removing the Peripheral Bay](#)
- [Installing the Peripheral Bay](#)
- [Interface Cables](#)
- [SCSI Configuration Information](#)
- [Installing a Device That Uses the System's Integrated SCSI Controller](#)
- [Installing a Tape Drive That Uses a Controller Card](#)
- [Connecting an External SCSI Tape Drive](#)
- [Installing SCSI Hard-Disk Drives](#)
- [Installing a Dell Host Adapter Card](#)
- [Installing a SCSI Backplane Daughter Card](#)
- [Configuring the Boot Device](#)

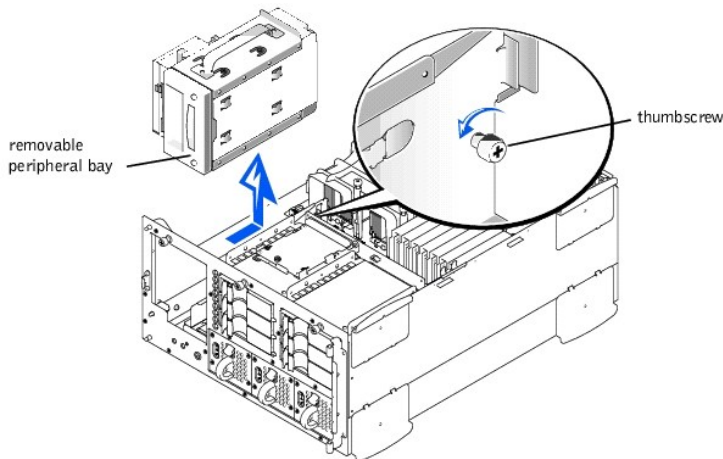
Your system features an internal drive bay that contains up to six SCSI hard-disk drives. Your system also features a removable peripheral bay that incorporates two drive bays for installing additional SCSI hard-disk drives. Attached to the removable peripheral bay is a user-accessible, half-height, CD ROM drive and a 3.5-inch diskette drive, which is controlled by the IDE/diskette drive controller on the system board. Instructions are also included for upgrading the system by installing an optional SCSI backplane daughter card for split backplane operation, or a PERC host adapter card.

Removing the Peripheral Bay

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
3. Remove the system cover.
4. Remove the front fan assembly (see "[Removing the Front Fan Assembly](#)" in "Installing System Board Options").
5. Disconnect the interface cable from the interposer board attached to the CD-ROM/diskette drive.
6. Loosen the thumbscrew securing the peripheral bay to the chassis (see [Figure 7-1](#)).

▣ **NOTE:** To slide the peripheral bay backward, you may need to disconnect the power cable on the SCSI backplane board.

Figure 7-1. Removing the Peripheral Bay



7. While grasping the peripheral bay handle, slide the peripheral bay backwards and lift the bay straight up to clear the chassis.

Installing the Peripheral Bay

1. Connect the interface cable from the system board to the CD-ROM/diskette drive interposer board.
2. While grasping the peripheral bay handle, lower the peripheral bay into the chassis.

3. Align the tabs on side of the peripheral bay with the locking slots in the chassis and slide the peripheral bay forward.
 4. Tighten the thumbscrew securing the peripheral bay to the chassis (see [Figure 7-1](#)).
 5. Replace the front fan assembly (see "[Replacing the Front Fan Assembly](#)" in "Installing System Board Options").
 6. Replace the system cover.
 7. Close the front bezel.
-

Interface Cables

If you install a SCSI device, you will connect it to the secondary SCSI interface connector (SCSI2 [Channel B]) on the system board (see [Figure 6-1](#)), or to a SCSI host adapter on an expansion card.

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

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

SCSI Configuration Information


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

SCSI ID Numbers

Each device attached to a SCSI host adapter must have a unique SCSI ID number from 1 to 7.

When SCSI devices are shipped from Dell, the default SCSI ID numbers are assigned as follows:


1. A SCSI tape drive is configured as SCSI ID 6 (the default ID number for a tape drive).

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


Device Termination

SCSI logic requires that the two devices at opposite ends of the SCSI chain be terminated and that all devices in between be unterminated. The SCSI cable included in the upgrade kit has an active terminator installed at the end of the cable. Therefore, when configuring the devices in the peripheral bay, you should disable the devices termination.

Installing a Device That Uses the System's Integrated SCSI Controller

 **WARNING:** Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)" in "[Troubleshooting Your System](#)."

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

 **CAUTION:** See "[Protecting Against Electrostatic Discharge](#)" in the safety instructions in your *System Information* document.

Ground yourself by touching an unpainted metal surface on the back of the system, unpack the drive, and compare the jumper and switch settings with those in the drive documentation. (See "[SCSI Configuration Information](#)," for information on setting the drive's SCSI ID number and enabling termination [if required].) Change any settings necessary for this system's configuration.

3. Open the front bezel (see "[Removing the Front Bezel](#)" in "[Troubleshooting Your System](#)").
4. Remove the system cover.
5. Disconnect the cable connected to the interposer board on top of the peripheral bay.

This cable is the system board interface cable connecting the interposer board of the CD-ROM/diskette drive to the system board.

6. Remove the inserts from the front of the peripheral bay.

From the inside of the chassis, push outwards on the center of the insert to remove the insert from the chassis.

7. Remove the peripheral bay (see "[Removing the Peripheral Bay](#)").
8. Slide the new drive into the peripheral bay until the holes in the peripheral bay and the drive line up.
9. Using four screws, secure the drive to the peripheral bay.
10. Install the peripheral bay (see "[Installing the Peripheral Bay](#)").
11. Connect the SCSI device to the SCSI cable provided with the device. Attach the other end of the SCSI cable to the interface connector SCSI/Channel B on the system board.

Route the SCSI cable under the front fan assembly.

12. Check all cable connections that may have been loosened during this procedure. Arrange cables so that they will not catch on the system cover or block the airflow of the fans or cooling vents.
13. Replace the system cover.
14. Close the front bezel.
15. Reconnect the system and peripherals to their power sources, and turn on the power.
16. Test the device.

To test a tape drive, see the documentation for the tape drive software to perform a tape drive backup and verification test.

Installing a Tape Drive That Uses a Controller Card

Tape drives that require their own separate controller cards are shipped with the controller card and an interface cable.

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)" in "[Troubleshooting Your System](#)."

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

▲ CAUTION: See "[Protecting Against Electrostatic Discharge](#)" in the safety instructions in your *System Information* document.

Ground yourself by touching an unpainted metal surface on the back of the system, unpack the drive and controller card, and compare the jumper and switch settings with those in the drive documentation. (See "[SCSI Configuration Information](#)," for information on setting the drive's SCSI ID number and enabling termination [if required].) Change any settings necessary for this system's configuration.

3. Open the front bezel (see "[Removing the Front Bezel](#)" in "[Troubleshooting Your System](#)").
4. Remove the system cover.
5. Disconnect the cable connected to the interposer board on top of the peripheral bay.

This cable is the system board interface cable connecting the interposer board of the CD-ROM/diskette drive to the system board.

6. Remove the inserts from the front of the peripheral bay.

From the inside of the chassis, push outwards on the center of the insert to remove the insert from the chassis.

7. Remove the peripheral bay (see "[Removing the Peripheral Bay](#)").
8. Slide the tape drive into the peripheral bay until the holes in the peripheral bay and the tape drive line up.
9. Using four screws, secure the drive to the peripheral bay.
10. Install the peripheral bay (see "[Installing the Peripheral Bay](#)").
11. Install the controller card in an expansion slot (see "[Installing an Expansion Card](#)" in "Installing System Board Options").
12. Attach the interface cable that came with the drive kit to the interface connector on the back of the drive.
13. Connect the SCSI device to the SCSI cable provided with the device. Attach the other end of the SCSI cable to interface connector SCSI/Channel B on the

system board.

Route the SCSI cable along the top of the cooling shroud.

14. Check all cable connections that may have been loosened during this procedure. Arrange cables so that they will not catch on the system cover or block the airflow of the fans or cooling vents.
 15. Replace the system cover.
 16. Close the front bezel.
 17. Reconnect the system and peripherals to their power sources, and turn on the power.
 18. Perform a tape backup and verification test with the drive as instructed in the tape-drive software documentation that came with the drive.
-

Connecting an External SCSI Tape Drive

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

Installing the Tape Drive

⚠ CAUTION: See "**Protecting Against Electrostatic Discharge**" in the safety instructions in your *System Information* document.

1. Prepare the tape drive for installation.

Ground yourself by touching an unpainted metal surface on the back of the system, unpack the drive and controller card, and compare the jumper and switch settings with those in the drive documentation. (See "[SCSI Configuration Information](#)," for information on setting the drive's SCSI ID number and enabling termination [if required].) Change any settings necessary for this system's configuration.

2. Unpack the tape drive (and controller card, if applicable), and configure the tape drive for the system according to the documentation that came with the tape drive.
 3. If the tape drive was supplied with a controller card, perform the following steps to install the card:
 - a. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
 - b. Remove the system cover.
 - c. Install the controller card in an expansion slot.
 - d. Replace the system cover.
 - e. Close the front bezel.
 4. Connect the tape drive's interface/DC power cable to the external SCSI connector on the back of the system, or the connector on the controller card supplied with the tape drive.
 5. Secure the controller card connection by tightening the screws on the connector.
 6. Reconnect the system and peripherals to electrical outlets, and turn on the power.
 7. Perform a tape backup and verification test with the drive as instructed in the software documentation that came with the drive.
-

Installing SCSI Hard-Disk Drives

This subsection describes how to install and configure SCSI hard-disk drives in the system's internal hard-disk drive bays, and how to upgrade the system by installing a Dell host adapter card.

The internal hard-disk drive bays provide space for up to six 1-inch hard-disk drives. These drives connect to a SCSI backplane board. A SCSI cable connects the SCSI backplane board to the SCSI host adapter connector on the system board or to an optional SCSI host adapter card such as the Dell PERC host adapter card.

Before You Begin

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

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

NOTE: Dell recommends that you use only drives that Dell has tested and approved for use with the SCSI backplane board.

Refer to the following guidelines when you configure the SCSI drive:

1. Disable termination on the drive. The SCSI backplane board provides termination for the SCSI bus.
1. Set the SCSI ID on all drives to 0. All SCSI ID numbers for the drives are set by the SCSI backplane board.
1. Configure the drive so that the drive motor waits for a Start Unit command from the SCSI host adapter before spinning.

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

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

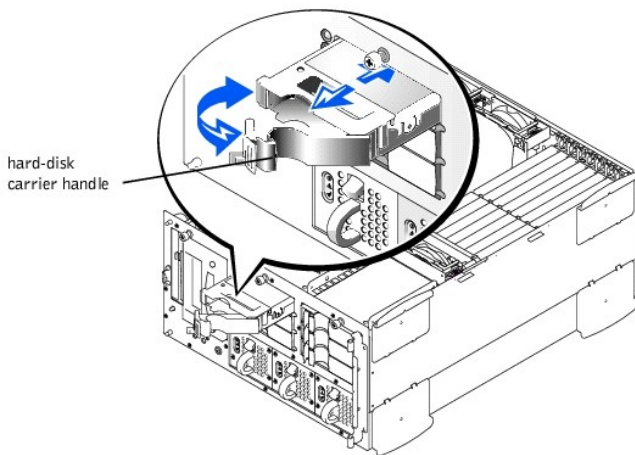
When you format a high-capacity SCSI hard-disk drive, allow enough time for the formatting to be completed. Long format times for these drives are normal. A 9 GB hard-disk drive, for example, can take up to 2.5 hours to format.

Installing a SCSI Hard-Disk Drive

NOTICE: Hot-plug drive installation is not supported for systems without an integrated RAID controller or Dell PERC host adapter card.

1. If the system does not have a RAID controller installed, shut down the system.
2. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
3. Open the hard-disk drive carrier handle (see [Figure 7-2](#)).

Figure 7-2. Installing a SCSI Hard-Disk Drive Carrier



4. Insert the carrier into the drive bay (see [Figure 7-2](#)).
5. Close the drive carrier handle to lock the drive in place.
6. Close the front bezel.
7. Install any required SCSI device drivers (see "Installing and Configuring SCSI Drivers," in the *User's Guide* for information).
8. If the hard-disk drive is a new drive, run the **SCSI Controllers** test in the Dell Diagnostics.

Removing a SCSI Hard-Disk Drive

NOTICE: Hot-plug drive installation is not supported for systems without an integrated RAID controller or Dell PERC host adapter card.

1. If the system does not have a RAID controller installed, shut down the system.
2. For systems with Dell PERC host adapter cards, power down the hard-disk drive bay and wait until the SCSI hard-disk drive indicator codes on the drive carrier signal that the drive may be removed safely.

If the drive has been online, the drive status indicators will flash sequentially as the drive is powered down. When all indicators are turned off, the drive is ready

for removal.

3. Open the front bezel (see ["Removing the Front Bezel"](#) in "Troubleshooting Your System").
4. Open the drive carrier handle to release the carrier.
5. Slide the carrier toward you until it is free of the drive bay.
6. Close the front bezel.

Installing a Dell Host Adapter Card

Follow these general guidelines when installing a Dell host adapter card. For specific instructions, see the documentation supplied with the host adapter card.

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see ["Safety First— For You and Your System"](#) in "Troubleshooting Your System."

▲ CAUTION: See "Protecting Against Electrostatic Discharge" in the Safety Instructions in your *System Information* document.

1. Unpack the host adapter card, and prepare it for installation.
See the documentation accompanying the host adapter card.
2. Open the front bezel (see ["Removing the Front Bezel"](#) in "Troubleshooting Your System").
3. Remove the system cover.
4. Remove the SCSI interface cable that connects the SCSI/Channel A host-adapter connector on the system board to the SCSEA connector on the SCSI backplane board (see [Figure 6-1](#)).
5. Install the host adapter card.

If you are installing a Dell PERC host adapter card, install the card in PCI expansion slot 1.

6. Install the SCSI interface cable supplied with the host adapter card to the SCSEA connector on the SCSI backplane board.

To identify the correct connector, see documentation for the host adapter card. Route the SCSI cable under the front fan assembly.

7. Connect the external SCSI devices to the SCSI host adapter card's external connector on the system's back-panel.

If you are attaching multiple external SCSI devices, daisy-chain the devices to each other by using the cables shipped with each device.

8. Replace the system cover.
9. Close the front bezel. Reconnect the system to an electrical outlet.
10. Connect the external device(s) to electrical outlet(s).
11. Install any required SCSI device drivers (see "Installing and Configuring SCSI Drivers," in the *User's Guide* for information and instructions).
12. Test the SCSI devices.

Test a SCSI hard-disk drive by running the **SCSI Controllers** test in the Dell Diagnostics. To test a SCSI tape drive, also see the documentation for the tape drive software to perform a tape drive backup and verification test.

Installing a SCSI Backplane Daughter Card

To operate the SCSI backplane in a 2 x 3 split backplane configuration, you must install an optional daughter card.

▲ WARNING: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see ["Safety First— For You and Your System"](#) in "Troubleshooting Your System."

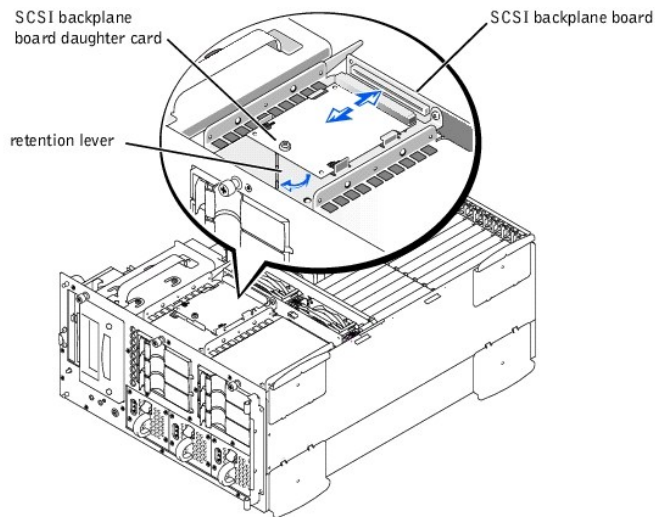
1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.

▲ CAUTION: See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.

2. Unpack the SCSI backplane board daughter card kit.

3. Open the front bezel (see "[Removing the Front Bezel](#)" in "Troubleshooting Your System").
4. Remove the system cover.
5. The daughter card fits between the sides of a card guide on the top of the drive bay. To install the card in the card guide:
 - a. Hold the daughter card by its edges with the component side facing up and the card connector facing the SCSI backplane board (see [Figure 7-3](#)).
 - b. Ensure that the retention lever is in the open position.

Figure 7-3. Installing a SCSI Backplane Board Daughter Card



- c. Position the card in the drive bay so that the notches on the left and right edges of the card are aligned with the tabs on the card guide in the drive bay.
 - d. Lower the card into the card guide.
6. Close the retention lever to slide the daughter card into the SCSI backplane connector and lock the card into place (see [Figure 7-3](#)).
7. Reconfigure the SCSI cable connections to the SCSI backplane as necessary to operate the backplane as a 2 x 3 split backplane.
8. Replace the system cover.
9. Close the front bezel. Reconnect the system and peripherals to their power sources and turn on power.

Configuring the Boot Device

If you plan to boot the system from a hard-disk drive, the drive must be attached to the primary (or boot) controller or SCSI host adapter card. The device that the system boots from is determined by the boot order specified in the system setup program.

The system setup program provides options that the system uses to scan for installed boot devices. Refer to the *User's Guide* for information about the system setup program.

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Getting Help

Dell™ PowerEdge™ 2500 Systems Installation and Troubleshooting Guide

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-

Help Overview

This section describes the tools Dell provides to help you when you have a problem with your computer. It also tells you when and how to contact Dell for technical or customer assistance.

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 Dell diagnostics.
3. Make a copy of the Diagnostics Checklist, and fill it out.
4. Use Dell's extensive suite of online services available at Dell's website (<http://www.dell.com>) for help with installation and troubleshooting procedures.

For more information, see "[World Wide Web](#)."

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


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.

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

For instructions on using the technical support service, see "[Technical Support Service](#)" and "[Before You Call](#)."

Help Tools

Dell provides a number of tools to assist you. These tools are described in the following sections.

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

World Wide Web

The Internet is your most powerful tool for obtaining information about your computer and other Dell products. Through the Internet, you can access most of the services described in this section, including AutoTech, TechFax, order status, technical support, and product information.

You can access Dell's support website at <http://support.dell.com>. To select your country, click the map that appears. The **Welcome to support.dell.com** page opens. Enter your system information to access help tools and information.

Dell can be accessed electronically using the following addresses:

- 1 World Wide Web

<http://www.dell.com/>

<http://www.dell.com/ap/> (for Asian/Pacific countries only)

<http://www.euro.dell.com> (for Europe only)

<http://www.dell.com/la> (for Latin American countries)

- 1 Anonymous file transfer protocol (FTP)

<ftp.dell.com/>

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

1 Electronic Support Service

support@us.dell.com

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

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

1 Electronic Quote Service

sales@dell.com

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

1 Electronic Information Service

info@dell.com

AutoTech Service

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

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

The AutoTech service is available 24 hours a day, seven days a week. You can also access this service through the technical support service. For the telephone number to call, see "Dell Contact Numbers."

TechFax Service

Dell takes full advantage of fax technology to serve you better. Twenty-four hours a day, seven days a week, you can call the Dell TechFax line toll-free for all kinds of technical information.

Using a touch-tone phone, you can select from a full directory of topics. The technical information you request is sent within minutes to the fax number you designate. For the TechFax telephone number to call, see "[Dell Contact Numbers](#)."

Automated Order-Status System

You can call this automated service to check on the status of any Dell products that you have ordered. A recording prompts you for the information needed to locate and report on your order. For the telephone number to call, see "[Dell Contact Numbers](#)."

Technical Support Service

Dell's industry-leading hardware technical-support service is available 24 hours a day, seven days a week, to answer your questions about Dell hardware.

Our technical support staff pride themselves on their track record: more than 90 percent of all problems and questions are taken care of in just one toll-free call, usually in less than 10 minutes. When you call, our experts can refer to records kept on your Dell system to better understand your particular question. Our technical support staff use computer-based diagnostics to provide fast, accurate answers to questions.

To contact Dell's technical support service, see "[Before You Call](#)" and then call the number for your country as listed in "[Dell Contact Numbers](#)."

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 handy when you call. For the telephone number to call, see "[Dell Contact Numbers](#)."

Product Information

If you need information about additional products available from Dell, or if you would like to place an order, visit Dell's website at <http://www.dell.com/>. For the telephone number to call to speak to a sales specialist, see "[Dell Contact Numbers](#)."

Returning Items for Warranty Repair or Credit

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

1. Call Dell to obtain an authorization number, and write it clearly and prominently on the outside of the box.

For the telephone number to call, see "[Dell Contact Numbers](#)."


2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of the Diagnostics Checklist indicating the tests you have run and any error messages reported by the Dell Diagnostics.

4. Include any accessories that belong with the item(s) being returned (such as power cables, software 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. Make sure that the system documentation is available.


 **CAUTION:** Before servicing any components inside your computer, see "[Safety First—For You and Your System.](#)"

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 <input type="checkbox"/> no <input type="checkbox"/>	
Network, version, and network card: _____	
Programs and versions: _____ _____ _____	
See your operating system documentation to determine the contents of the system's startup files. Print each file if possible. Otherwise, record the contents of each file before calling Dell.	
Error message, beep code, or diagnostic code: _____	
Description of problem and troubleshooting procedures you performed: _____ _____ _____	

Dell Contact Numbers

The following table provides country-specific access codes and telephone numbers, websites, and email addresses that you can use to contact Dell.

The codes required depend on where you are calling from as well as the destination of your call; in addition, each country has a different dialing protocol. If you need assistance in determining which codes to use, contact a local or an international operator.

 **NOTE:** Toll-free numbers are for use only within the country for which they are listed. Area codes are most often used to call long distance within your own country (not internationally)—in other words, when your call originates in the same country you are calling.

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
Australia (Sydney) International Access Code: 0011 Country Code: 61 City Code: 2	Home and Small Business	1-300-65-55-33
	Government and Business	toll free: 1-800-633-559
	Preferred Accounts Division (PAD)	toll free: 1-800-060-889
	Customer Care	toll free: 1-800-819-339
	Corporate Sales	toll free: 1-800-808-385
	Transaction Sales	toll free: 1-800-808-312
	Fax	toll free: 1-800-818-341
Austria (Vienna) International Access Code: 900 Country Code: 43 City Code: 1	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
	Website: http://support.euro.dell.com E-mail: tech_support_germany@dell.com	
Belgium (Brussels) International Access Code: 00 Country Code: 32 City Code: 2	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
	Website: http://support.euro.dell.com E-mail: tech_be@dell.com	
Brazil International Access Code: 0021 Country Code: 55 City Code: 51	Customer Support, Technical Support	0800 90 3355
	Sales	0800 90 3366
	Website: http://www.dell.com/br	
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: 1-800-387-5759
	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
Chile (Santiago) Country Code: 56 City Code: 2	Sales, Customer Support, and Technical Support	toll free: 1230-020-4823
China (Xiamen) Country Code: 86 City Code: 592	Technical Support	toll free: 800 858 2437
	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	toll free: 800 858 2999
Czech Republic (Prague) International Access Code: 00 Country Code: 420 City Code: 2	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
	Website: http://support.euro.dell.com	
	E-mail: czech_dell@dell.com	
Denmark (Horsholm) International Access Code: 009 Country Code: 45	Technical Support	45170182
	Relational Customer Care	45170184
	Home/Small Business Customer Care	32875505
	Switchboard	45170100
	Fax Technical Support (Upplands Vasby, Sweden)	859005594
	Fax Switchboard	45170117
	Website: http://support.euro.dell.com	
	E-mail: den_support@dell.com	
Finland (Helsinki) International Access Code: 990 Country Code: 358 City Code: 9	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
	Website: http://support.euro.dell.com	
	E-mail: fin_support@dell.com	
France (Paris/Montpellier) International Access Code: 00 Country Code: 33 City Code: (1) (4)	Home and Small Business	
	Technical Support	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (Alternative)	04 99 75 40 39
	Sales	0825 004 700
	Fax	0825 004 701
	Website: http://support.euro.dell.com	
	E-mail: web_fr_tech@dell.com	
	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 99

	Website: http://support.euro.dell.com	
	E-mail: web_fr_tech@dell.com	
Germany (Langen)	Technical Support	06103 766-7200
International Access Code: 00	Technical Support Fax	06103 766-9222
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
	Website: http://support.euro.dell.com	
	E-mail: tech_support_germany@dell.com	
Hong Kong	Technical Support	toll free: 800 96 4107
International Access Code: 001	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: 852	Transaction Sales	toll free: 800 96 4109
	Corporate Sales	toll free: 800 96 4108
Ireland (Cherrywood)	Technical Support	0870 908 0800
International Access Code: 16	Customer Care	01 204 4026
Country Code: 353	Sales	01 286 0500
City Code: 1	SalesFax	01 204 0144
	Fax	0870 907 5590
	Switchboard	01 286 0500
	Website: http://support.euro.dell.com	
	E-mail: dell_direct_support@dell.com	
Italy (Milan)	Home and Small Business	
International Access Code: 00	Technical Support	02 577 826 90
Country Code: 39	Customer Care	02 696 821 14
City Code: 02	Fax	02 696 824 13
	Switchboard	02 696 821 12
	Website: http://support.euro.dell.com	
	E-mail: web_it_tech@dell.com	
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
	Website: http://support.euro.dell.com	
	E-mail: web_it_tech@dell.com	
Japan (Kawasaki)	Technical Support (Server)	toll free: 0120-1984-35
International Access Code: 001	Technical Support (Dimension™ and Inspiron™)	toll free: 0120-1982-56
Country Code: 81		or 0088-25-3355
City Code: 44	Technical Support (Workstation, Optiplex™ and Latitude™)	toll free: 0120-1984-39
		or 0088-22-7890
	24-Hour Automated Order Service	044 556-3801
	Customer Care	044 556-4240
	Home and Small Business Group Sales	044 556-3344
	Preferred Accounts Division Sales	044 556-3433
	Large Corporate Accounts	044 556-3430

	Faxbox Service	044 556-3490
	Switchboard	044 556-4300
	Website: http://support.jp.dell.com	
Korea (Seoul) International Access Code: 001 Country Code: 82 City Code: 2	Technical Support	toll free: 080-200-3800
	Sales	toll free: 080-200-3777
	Customer Service (Seoul, Korea)	2194-6220
	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	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
	Website: http://support.euro.dell.com	
	E-mail: tech_be@dell.com	
Macau 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: 95 Country Code: 52 City Code: 5	Automated Order-Status System (Austin, Texas, U.S.A.)	512 728-0685
	AutoTech (Automated technical support) (Austin, Texas, U.S.A.)	512 728-0686
	Customer Technical Support	525 228-7870
	Sales	525 228-7811
		or toll free: 91-800-900-37
		or toll free: 91-800-904-49
	Customer Service	525 228-7878
Main	525 228-7800	
Netherlands (Amsterdam) International Access Code: 00 Country Code: 31 City Code: 20	Technical Support	020 581 8838
	Customer Care	020 581 8740
	Home/Small Business Sales	toll free: 0800-0663
	Home/Small Business Sales Fax	020 682 7171
	Corporate Sales	020 581 8818
	Corporate Sales Fax	020 686 8003
	Fax	020 686 8003
	Switchboard	020 581 8818
	Website: http://support.euro.dell.com	

	E-mail: tech_nl@dell.com	
New Zealand	Home and Small Business	0800 446 255
International Access Code: 00	Government and Business	0800 444 617
Country Code: 64	Sales	0800 441 567
	Fax	0800 441 566
Norway (Lysaker)	Technical Support	671 16882
International Access Code: 095	Relational Customer Care	671 17514
Country Code: 47	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Technical Support (Upplands Vasby, Sweden)	590 05 594
	Fax Switchboard	671 16865
	Website: http://support.euro.dell.com	
	E-mail: nor_support@dell.com	
Poland (Warsaw)	Technical Support	22 57 95 700
International Access Code: 011	Customer Care	22 57 95 999
Country Code: 48	Sales	22 57 95 999
City Code: 22	Fax	22 57 95 998
	Switchboard	22 57 95 999
	Website: http://support.euro.dell.com	
	E-mail: pl_support@dell.com	
Portugal	Technical Support	35 800 834 077
International Access Code: 00	Customer Care	34 902 118 540 or 35 800 834 075
Country Code: 35	Sales	35 800 834 075
	Fax	35 121 424 01 12
	E-mail: es_support@dell.com	
Singapore (Singapore)	Technical Support	toll free: 800 6011 051
International Access Code: 005	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: 65	Transaction Sales	toll free: 800 6011 054
	Corporate Sales	toll free: 800 6011 053
South Africa (Johannesburg)	Technical Support	011 709 7710
International Access Code: 09/091	Customer Care	011 709 7707
Country Code: 27	Sales	011 709 7700
City Code: 11	Fax	011 709 0495
	Switchboard	011 709 7700
	Website: http://support.euro.dell.com	
	E-mail: dell_za_support@dell.com	
Southeast Asian and Pacific Countries	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid)	Home and Small Business	
International Access Code: 00	Technical Support	902 100 130
Country Code: 34	Customer Care	902 118 540
City Code: 91	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Website: http://support.euro.dell.com	
	E-mail: web_esp_tech@dell.com	
	Corporate	
	Technical Support	902 100 130

	Customer Care	902 118 546
	Switchboard	91 722 92 00
	Fax	91 722 95 83
	Website: http://support.euro.dell.com	
	E-mail: web_esp_tech@dell.com	
Sweden (Upplands Vasby)	Technical Support	08 590 05 199
International Access Code: 009	Relational Customer Care	08 590 05 642
Country Code: 46	Home/Small Business Customer Care	08 587 70 527
City Code: 8	Fax Technical Support	08 590 05 594
	Sales	08 590 05 185
	Website: http://support.euro.dell.com	
	E-mail: swe_support@dell.com	
Switzerland (Geneva)	Technical Support (Home and Small Business)	0844 811 411
International Access Code: 00	Technical Support (Corporate)	0844 822 844
Country Code: 41	Customer Care	0848 802 802
City Code: 22	Fax	022 799 01 90
	Switchboard	022 799 01 01
	Website: http://support.euro.dell.com	
	E-mail: swisstech@dell.com	
Taiwan	Technical Support	toll free: 0080 60 1255
International Access Code: 002	Technical Support (Servers)	toll free: 0080 60 1256
Country Code: 886	Transaction Sales	toll free: 0080 651 228 or 0800 33 556
	Corporate Sales	toll free: 0080 651 227 or 0800 33 555
Thailand	Technical Support	toll free: 0880 060 07
International Access Code: 001	Customer Support (Penang, Malaysia)	604 633 4949
Country Code: 66	Sales	toll free: 0880 060 09
U.K. (Bracknell)	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
International Access Code: 010	Technical Support (Direct/PAD and General)	0870 908 0800
Country Code: 44	Global Accounts Customer Care	01344 723186
City Code: 1344	Corporate Customer Care	01344 723185
	Preferred Accounts (500-5000 employees) Customer Care	01344 723196
	Central Government Customer Care	01344 723193
	Local Government Customer Care	01344 723194
	Home/Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860456
	Website: http://support.euro.dell.com	
	E-mail: dell_direct_support@dell.com	
U.S.A. (Austin, Texas)	Automated Order-Status System	toll free: 1-800-433-9014
International Access Code: 011	AutoTech (for portable and desktop computers)	toll free: 1-800-247-9362
Country Code: 1	Dell Home and Small Business Group (for portable and desktop computers):	
	Customer Technical Support (Return Material Authorization Numbers)	toll free: 1-800-624-9896
	Customer Technical Support (Home sales purchased via http://www.dell.com)	toll free: 1-877-576-3355
	Customer Service (Credit Return Authorization Numbers)	toll free: 1-800-624-9897
	National Accounts (systems purchased by established Dell national accounts [have your account number handy], medical institutions, or value-added resellers [VARs]):	
	Customer Service and Technical Support (Return Material Authorization	toll free: 1-800-822-8965

Numbers)	
Public Americas International (systems purchased by governmental agencies [local, state, or federal] or educational institutions):	
Customer Service and Technical Support (Return Material Authorization Numbers)	toll free: 1-800-234-1490
Dell Sales	toll free: 1-800-289-3355 or toll free: 1-800-879-3355
Spare Parts Sales	toll free: 1-800-357-3355
DellWare™	toll free: 1-800-753-7201
Desktop and Portable Fee-Based Technical Support	toll free: 1-800-433-9005
Server Fee-Based Technical Support	toll free: 1-800-967-0765
Sales (Catalogs)	toll free: 1-800-426-5150
Fax	toll free: 1-800-727-8320
TechFax	toll free: 1-800-950-1329
Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll free: 1-877-DELLTTY (1-877-335-5889)
Switchboard	512 338-4400
Dellnet Technical Support	toll free: 1-877-Dellnet (1-877-335-5638)





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• [Notes, Notices, Cautions, and Warnings](#)

Notes, Notices, Cautions, and Warnings

-  **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 potentially hazardous situation which, if not avoided, may result in minor or moderate injury.
 -  **WARNING:** A WARNING indicates a potentially hazardous situation which, if not avoided, may result in severe injury.
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