




Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

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Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
 -  **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
 -  **CAUTION:** A CAUTION indicates a potential for property damage, personal injury, or death.
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Jumpers and Connectors

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- [Jumpers—A General Explanation](#)
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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 system.

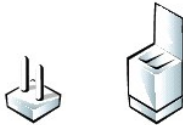
Jumpers—A General Explanation

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



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

[Figure A-2](#) shows the location and default settings of the 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 jumpers.

Figure A-2. System Board Jumpers

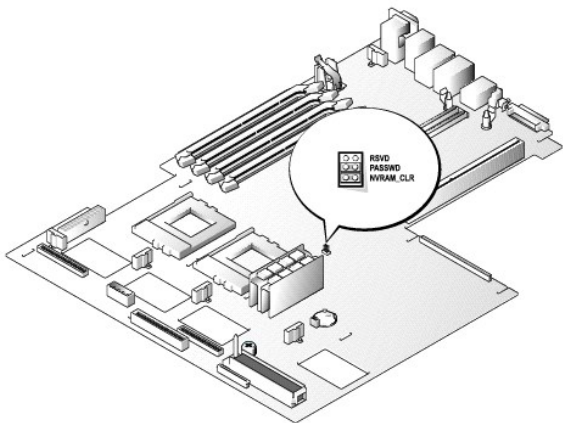









Table A-1. System-Board Jumper Settings

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.)
RSVD		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 ."		

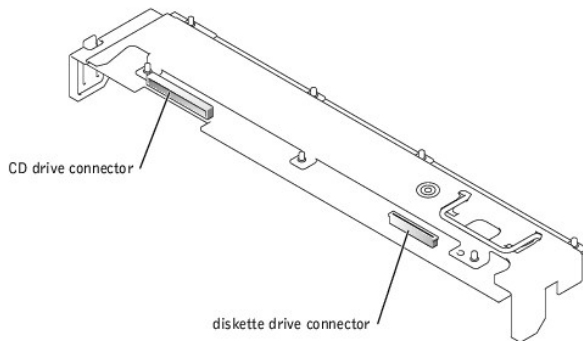
System Board Connectors

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 top of the SCSI backplane board.

Figure A-3. Connectors on the SCSI Backplane Board



Disabling a Forgotten Password

The system's software security features include a system password and a setup password, which are discussed in detail in "Using the System Setup Program" in the *User's Guide*. 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 in your *System Information* document.

1. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
2. Refer to [Figure A-2](#) for the location of the password jumper (labeled "PASSWD") on the system board.
3. Remove the jumper plug from the PASSWD jumper.
4. Replace the system cover, and then reconnect the system 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.

5. Repeat step 1.

6. Install the jumper plug on the PASSWD jumper.
7. Replace the system cover, and then reconnect the system and peripherals to their electrical outlets and turn them on.
8. Assign a new system and/or setup password.

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

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Abbreviations and Acronyms

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

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

A

ampere(s)

AC

alternating current

ACPI

Advanced Configuration and Power Interface

ADC

analog-to-digital converter

ANSI

American National Standards Institute

APIC

Advanced Peripheral Interrupt Controller

ASIC

application-specific integrated circuit

BIOS

basic input/output system

bpi

bits per inch

bps

bits per second

BTU

British thermal unit

C

Celsius

CD

compact disc

CD

compact disc

CGA

color graphics adapter

cm

centimeter(s)

cpi

characters per inch

cpl

characters per line

CPU

central processing unit

DAC

digital-to-analog converter

DAT

digital audio tape

dB

decibel(s)

dB(A)

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 remote access 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

ft

feet

g

gram(s)

G

gravities

GB

gigabyte(s)

GUI

graphical user interface

h**Hz**

hertz

I/O

input/output

ID

identification

IDE

integrated drive electronics

IRQ

interrupt request

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

mm

millimeter(s)

ms

millisecond(s)

MTBF

mean time between failures

mV

millivolt(s)

NIC

network interface controller

NiCad

nickel cadmium

NiMH

nickel-metal hydride

NMI

nonmaskable interrupt

ns

nanosecond(s)

NTFS

NT File System

NVRAM

nonvolatile random-access memory

OTP

one-time programmable

PAL

programmable array logic

PCI

Peripheral Component Interconnect

PCMCIA

Personal Computer Memory Card International Association

PDB

power distribution board

PGA

pin grid array

POST

power-on self-test

ppm

pages per minute

PQFP

plastic quad flat pack

PS/2

Personal System/2

PXE

preboot execution environment

RAID

redundant arrays of independent disks

RAM

random-access memory

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

SCSI

small computer system interface

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

SVGA

super video graphics array

TFT

thin film transistor

tpi

tracks per inch

UMB

upper memory block

UPS

uninterruptible power supply

V

volt(s)

VAC

volt(s) alternating current

VDC

volt(s) direct current

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™ 1650 Systems Installation and Troubleshooting Guide

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

Your system is a rack-dense, highly available, feature-rich server that offers significant service and upgrade features. This system includes 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 if a power supply fails
- 1 A comprehensive system diagnostics program, which checks for hardware problems (if the system can boot)

The following system upgrade options are offered:

- 1 An additional microprocessor
- 1 A second, hot-pluggable power supply
- 1 Additional memory
- 1 An optional RAID on motherboard (ROMB) card
- 1 A variety of PCI expansion-card options
- 1 A remote management solution for systems management

Other Documents You May Need

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

- 1 The *Setting Up Your System* document provides general instructions for setting up your system.
- 1 The *User's Guide* describes system features and technical specifications, video and SCSI device drivers, the System Setup program, and software support utilities.
- 1 The *Rack Installation Guide* describes how to unpack, set up, and install your system in a rack.
- 1 The *System Information* document provides important safety and regulatory information. Warranty information might be included within this document or as a separate document.
- 1 The system management software documentation 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.
- 1 Operating system documentation may be included if you ordered an operating system with the system. This documentation describes how to install (if necessary), configure, and use the operating system software.
- 1 Documentation is included with any options you purchased separately from the system. This documentation includes information that you need to configure and install these options in your system.

You may also have 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 Technical information files—sometimes called "readme" files—may be installed on the hard drive to provide last-minute updates about technical changes to the system or advanced technical reference material intended for experienced users or technicians.

Obtaining Technical Assistance

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

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Indicators, Messages, and Codes

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

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

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

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

- 1 Indicators on the front bezel
- 1 Front-panel indicators
- 1 SCSI hard drive indicators
- 1 Power supply indicators
- 1 System messages
- 1 System beep codes
- 1 Warning messages
- 1 Diagnostics messages
- 1 Alert messages

The system indicators and the front and back panel features are illustrated in the following figures. 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.

Indicators on the System Bezel

The system bezel incorporates a system status indicator divided into blue and amber system status indicators (see [Figure 2-1](#)). The blue indicator lights when the system is operating correctly. The amber caution indicator lights when the system needs attention due to a problem with power, a cooling fan, internal temperature, or a hard drive.

[Table 2-1](#) lists the system's indicator patterns. Different patterns are displayed as events occur in the system.

Figure 2-1. System Status Indicators

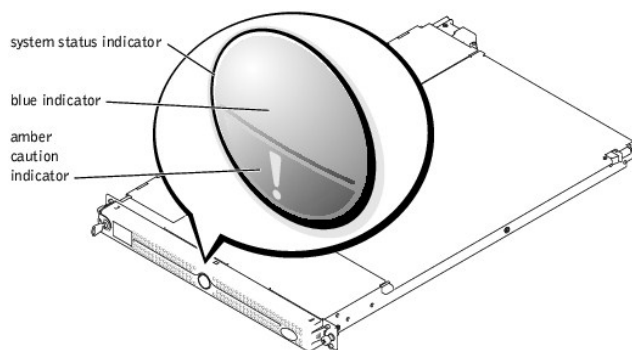


Table 2-1. System Status Indicator Patterns

Blue Indicator	Amber Caution Indicator	Description
----------------	-------------------------	-------------

Off	Off	There is no power available to the system, or power is available to the system, but the system is not powered on.
Off	Blinking	The system has detected an error.
On	Off	Power is on, and the system is operational.
Blinking	Off	The indicator has been activated to identify the system in a rack.

Front-Panel Indicators and Features

Figure 2-2 shows the controls, indicators, and connectors located behind the bezel on the system's front panel:

Figure 2-2. Front-Panel Features

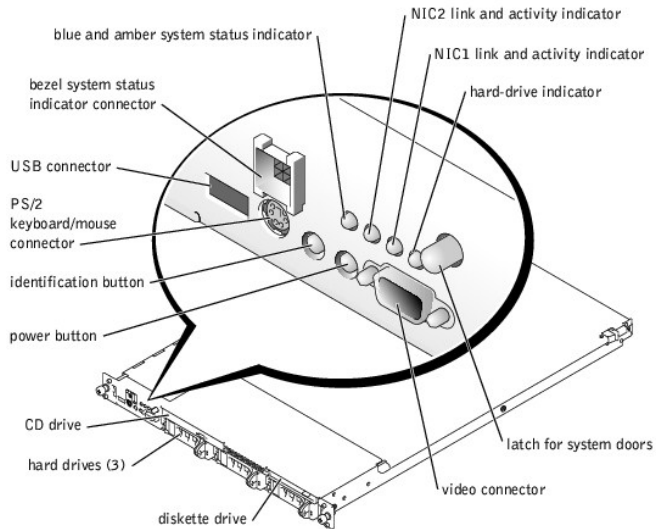


Table 2-2 describes the indicators on the front panel.

Table 2-2. Front-Panel Indicators

LED Indicator	Icon	Description
blue and amber system status indicator		The blue system status indicator lights up during normal system operation. The server management software can also cause the blue system status indicator to flash to identify a particular system. The amber system status indicator flashes when the system needs attention due to a problem with power supplies, fans, system temperature, or hard drives. NOTE: If the system is connected to AC power, the amber system status indicator will flash regardless of whether the system has been powered on.
NIC1 and NIC2 link and activity indicators		The link and activity indicators for the two integrated NICs light when the NICs are in use.
hard-drive indicator		The green hard-drive activity indicator flashes when the hard drives are in use (see Figure 2-4 for more information on hard-drive indicators).
Power button		The power button lights when the system power is on.

1 The power button controls the AC power input to the system's power supplies. The power button lights green when the system power is on.

NOTE: If you turn off the system using the power button and the system is running an ACPI-compliant operating system (such as Microsoft® Windows® 2000), the system performs a graceful shutdown before the power is turned off. If the system is not running an ACPI-compliant operating system, the power is turned off immediately after the power button is pressed.

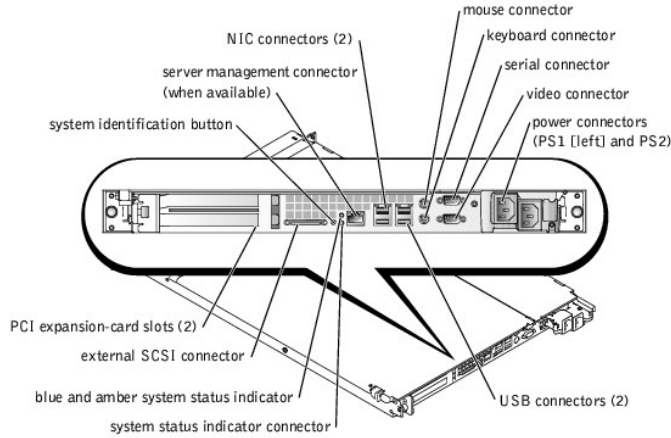
- 1 The two identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed, the blue identification indicator on the front and back blinks until one of the buttons is pushed again.

The front panel also incorporates a USB connector, a video connector, and a PS/2 connector to connect a mouse and keyboard using a Y-cable (see [Figure 2-2](#)).

Back-Panel Features

[Figure 2-3](#) shows the back-panel features of the system.

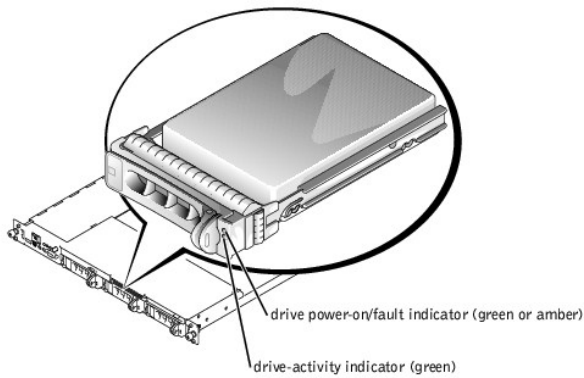
Figure 2-3. Back-Panel Features



SCSI Hard-Drive Indicator Codes

If your system has SCSI hard drives installed and if the integrated RAID controller is activated, two indicators on each of the hard-drive carriers provide information on the status of the hard drives (see [Figure 2-4](#) and [Table 2-3](#)). The SCSI backplane firmware controls the drive power-on/fault indicator.

Figure 2-4. SCSI Hard-Drive Indicators



[Table 2-3](#) lists the drive indicator patterns. Different patterns are displayed as drive events occur in the system. For example, in the event of a hard-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 the optional ROMB card is installed, you will see only the "drive online" indicator pattern. You will also see the drive-activity indicator blink when the drive is being accessed.

Table 2-3. SCSI Hard-Drive Indicator Patterns

Condition	Indicator Pattern
Identify drive	The green power-on/fault indicator blinks 4 times per second.

Drive being prepared for removal	The green power-on/fault indicator blinks 2 times per second.
Drive ready for insertion or removal	Both drive indicators are off.
Drive being prepared for operation	The green power-on/fault indicator is on.
Drive predicted failure	The power-on/fault indicator slowly blinks green, amber, and off.
Drive failed	The amber power-on/fault indicator blinks 4 times per second.
Drive rebuilding	The green power-on/fault indicator blinks slowly.
Drive online	The green power-on/fault indicator is on.

Power Supply Features

Each hot-pluggable power supply has three indicators, visible when the system doors are open, that indicate whether power is present or whether a power fault has occurred. See "[Opening the System Doors](#)" in "Checking Inside the System" for information on accessing the inside of the system.

Figure 2-5. Power Supply Features

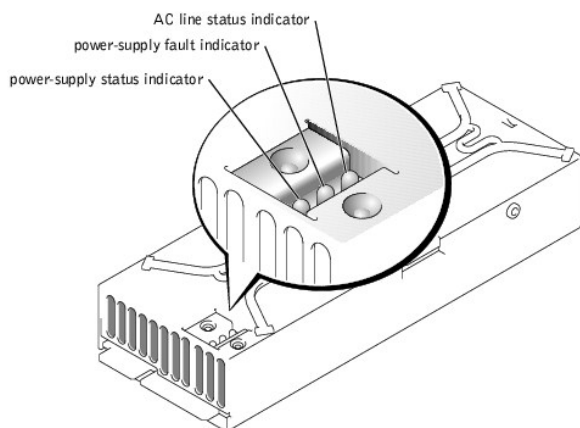


Table 2-4. Power-Supply Indicator Patterns

Indicator	Indicator Code
AC line status	Green indicates that a valid AC source is connected to the system.
Power supply fault	Red indicates a problem with the power supply
Power supply status	Green indicates that the power supply is operational.

System Messages

System messages alert you to a possible operating system problem or to a conflict between the software and hardware. [Table 2-5](#) 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 2-5](#), check the documentation for the application that is running when the message appears or the operating system's documentation for an explanation of the message and recommended action.

Table 2-5. System Messages

Message	Causes	Corrective Actions
Address mark not found	Faulty diskette/CD drive subsystem or hard-drive subsystem (defective system board).	Replace the system board. See " Getting Help ."
Amount of available memory limited to 256 MB!	OS Install Mode is enabled in the System Setup program.	Disable the OS Install Mode in the System Setup program. See "Using the System Setup program" in the <i>User's Guide</i> .
Auxiliary device failure	Mouse or keyboard cable connector loose or improperly connected; defective mouse or keyboard.	Check the mouse and keyboard cable connections. See " External Connections " in "Troubleshooting Your System." If the problem persists, replace the mouse. If the problem persists, replace the keyboard. See " Getting Help ".
BIOS Update Attempt Failed!	Remote BIOS update attempt failed.	Retry the BIOS update. If the problem persists, see " Getting Help ."
Caution! NVRAM_CLR jumper is installed on	Incorrect configuration settings in System	Check the System Setup configuration settings. See "Using


system board - please run SETUP program	Setup program, NVRAM_CLR jumper is installed, or faulty system battery.	the System Setup Program" in the <i>User's Guide</i> . Remove the NVRAM_CLR jumper. See Figure A-2 for jumper location. Replace the battery. See "Replacing the System Battery" in "Installing System Board Options."
CPUs with different cache sizes detected	Two different types of microprocessors are installed.	Install a correct version of the microprocessor so that both microprocessors have the same level 2 cache size. See "Adding or Replacing a Microprocessor" in "Installing System Board Options."
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. If the problem persists, see "Getting Help."
Diskette drive 0 seek failure	Faulty or improperly inserted diskette, incorrect configuration settings in System Setup program, loose diskette 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> . Check that the diskette drive interface cable is connected correctly. See "Installing Drives."
Diskette read failure	Faulty diskette, or faulty or improperly connected diskette drive.	Check that the diskette drive interface cable is connected correctly. See "Installing Drives."
Diskette subsystem reset failed	Faulty diskette/CD drive controller (defective system board).	Replace the system board. See "Getting Help."
ECC memory error	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. If the problem persists, see "Getting Help."
Embedded server management error Embedded server management is not present	Embedded server management memory may be temporarily corrupted.	To clear the embedded server management memory, shut down the system, disconnect the power cord(s), wait approximately 30 seconds, and then reconnect the power cord(s) and restart the system. If the problem persists, see "Getting Help."
Error: Dell Remote Access Card initialization failure	Defective server management card or system board.	Replace the expansion card. See "Installing Expansion Cards" in "Installing System Board Options." If the problem persists, replace the system board. See "Getting Help."
Gate A20 failure	Faulty keyboard controller (defective system board).	Replace the system board. See "Getting Help."
Hard disk controller failure Hard disk read failure	Incorrect configuration settings in System Setup program, improperly connected hard drive, faulty hard-drive controller subsystem (defective system board), or loose power cable.	Check the hard-drive configuration settings in the System Setup program. See "Using the System Setup Program" in the <i>User's Guide</i> . Reinstall the hard 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, NVRAM_CLR jumper is installed, or faulty system battery.	Check the System Setup configuration settings. See "Using the System Setup Program" in the <i>User's Guide</i> . Remove the NVRAM_CLR jumper. See Figure A-2 for Jumper location. Replace the battery. See "Replacing the System Battery" in "Installing System Board Options."
Invalid memory configuration detected. Potential for data corruption exists!	Memory modules are not installed in matched pairs.	Install memory modules in matched pairs. See "Installing Memory" in "Installing System Board Options."
Invalid NVRAM configuration, resource re-allocated	System configuration data has been ignored.	Check the System Setup configuration settings. See "Using the System Setup Program" in the <i>User's Guide</i> .
I/O parity interrupt at address	Expansion card(s) is improperly installed or faulty.	Reinstall the expansion card(s). See "Installing Expansion Cards" in "Installing System Board Options." If the problem persists, replace the expansion card(s).
Keyboard controller failure	Defective keyboard/mouse controller (defective system board).	Replace the system board. See "Getting Help."
Keyboard data line failure Keyboard stuck key failure Keyboard clock line failure Keyboard failure	Keyboard cable connector is loose or improperly connected; defective keyboard; 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."
Memory address line failure at address, read value expecting value Memory high data line failure at start address to end address Memory high address line failure at start address to end address Memory double word logic failure at start address to end address Memory odd/even logic failure at start address to end address Memory write/read failure at address, read value expecting value	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. If the problem persists, see "Getting Help."
Memory parity failure at start address to end address	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. If the

Memory parity error at address		problem persists, see "Getting Help."
No boot device available	Faulty diskette, diskette/CD drive subsystem, hard drive, or hard-drive subsystem; no boot disk in drive A.	Replace the diskette or the hard drive. See "Installing Drives." If the problem persists, replace the system board. See "Getting Help."
No boot sector on hard-disk	No operating system on hard drive.	Check the hard-drive configuration settings in the System Setup program. See "Using the System Setup Program" in the <i>User's Guide</i> .
No timer tick interrupt	Defective system board.	Replace the system board. See "Getting Help."
No FXE-capable device available	<F12> pressed during POST and no PXE devices are detected.	Check the cables connected to the NICs. Check the configuration settings in the System Setup program for the NICs. See "Using the System Setup Program" in the <i>User's Guide</i> .
Not a boot diskette	No operating system on diskette.	Use a bootable diskette.
Plug & Play Configuration Error Embedded xxx	Error encountered in initializing PCI device, or defective system board.	Install NVRAM_CLR jumper and reboot the system. If problem persists, replace the system board. See "Getting Help."
Plug & Play Configuration Error PCI_n	Error encountered in initializing PCI adapter.	Install NVRAM_CLR jumper and reboot the system. If the problem persists, replace the specified expansion-card. See "Installing Expansion Cards" in "Installing System Board Options." If the problem persists, replace the system board. See "Getting Help."
Primary backplane error	Improperly attached or missing backplane.	Check that the SCSI backplane board is fully seated. See "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System."
Primary IDE device 0 not found Primary IDE device 1 not found	Improperly connected or missing IDE device.	Check that the device's interface cable is securely connected to the SCSI backplane board or system board. Replace the device. If the problem persists, see "Getting Help."
Processor 1 internal error Processor 2 internal error	Defective microprocessor or system board (reported by the NMI handler).	Replace the specified microprocessor. See "Installing Microprocessors" in "Installing System Board Options." If the problem persists, replace the system board. See "Getting Help."
Processor bus error PCI bus error IMB bus error	Defective system board (reported by the NMI handler).	Replace the system board. See "Getting Help."
Processor in socket 1 not installed!	No microprocessor installed in primary microprocessor socket.	Install a microprocessor in the primary microprocessor socket. See "Installing Microprocessors" in "Installing System Board Options."
Secondary IDE device 0 not found Secondary IDE device 1 not found	Improperly connected or missing IDE device.	Check that the device's interface cable is securely connected to the system board. Replace the device. See "Installing an IDE Hard Drive" in "Installing Drives." If the problem persists, see "Getting Help."
Shutdown failure	Defective system board.	Replace the system board. See "Getting Help."
System backplane error	Improperly attached or missing SCSI backplane.	Check that the SCSI backplane board is fully seated. See "Troubleshooting SCSI Hard Drives" in "Troubleshooting Your System."
System halted! Must power down.	Wrong password entered too many times.	Reboot the system and enter the correct password. Have a trained service technician clear the system password. See "Disabling a Forgotten Password" in "Jumpers and Connectors."
System parity error	Defective expansion card(s) or improperly seated or faulty memory modules (reported by the NMI handler).	Replace expansion cards one at a time until error is corrected. See "Installing Expansion Cards" in "Installing System Board Options." Remove and reseat the memory modules. See "Installing Memory Modules" in "Installing System Board Options." If the problem persists, replace the memory modules. If the problem persists, see "Getting Help."
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."
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> . If the problem persists, 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."
Timer chip counter 2 failed	Defective system board.	Replace the system board. See "Getting Help."
Unsupported CPU combination	Microprocessor combination is not supported by system.	Install a supported microprocessor combination. See "Installing Microprocessors" in "Installing System Board Options."
Unsupported CPU stepping detected.	Microprocessor is not supported by system.	Install a correct version of the microprocessor in the specified microprocessor socket. See "Installing Microprocessors" in "Installing System Board Options."
Utility partition not available	<F10> key was pressed during POST, but no utility partition exists on the boot hard drive.	Create a utility partition on the boot hard drive. See "Using the Dell OpenManage Server Assistant CD" in your <i>User's Guide</i> .
Warning: Detected mode change from RAID to SCSI	Type of controller has changed since	Back up information on the hard drives before changing

of the embedded RAID subsystem. Warning: Detected missing RAID hardware for the embedded RAID subsystem. Data loss will occur! Press Y to switch mode to SCSI, press any other key to disable both channels. Press Y to confirm the change; press any other key to cancel.	previous system boot.	the type of controller used with the drives.
Warning! Firmware is out-of-date, please update	Out-of-date firmware.	Update the system firmware. See "Using the <i>Dell OpenManage Server Assistant</i> CD" in your <i>User's Guide</i> for information on updating the system firmware.
Warning! No microcode update loaded for processor X	BIOS not up to date.	Upgrade the BIOS, but do not turn the system off before the upgrade. See "Using the System Setup Program" in the <i>User's Guide</i> .
Write fault Write fault on selected drive	Faulty diskette or hard drive.	Replace the diskette or hard drive. See " Installing Drives ."
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.

 **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 2-6](#). If you are unable to resolve the problem by looking up the meaning of the beep code, use the system diagnostics to identify a more serious cause. If you are still unable to resolve the problem, see "[Getting Help](#)."

Table 2-6. System Beep Codes

Code	Cause	Corrective Action
1-1-2	CPU register test failure	Replace microprocessor 1. See " Installing Microprocessors " in "Installing System Board Options." If the problem persists, replace microprocessor 2.
1-1-3	CMOS write/read failure	Replace the system board. See " Getting Help ."
1-1-4	BIOS checksum failure	This fatal error usually requires replacement of the BIOS firmware. See " Getting Help ."
1-2-1	Programmable interval-timer failure	Replace the system board. See " Getting Help ."
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. If the problem persists, see " Getting Help ."
1-2-3	DMA page register write/read failure	
1-3-1	Main-memory refresh verification failure	
1-3-2	No memory installed	
1-3-3	Chip or data line failure in the first 64 KB of main memory	
1-3-4	Odd/even logic failure in the first 64 KB of main memory	
1-4-1	Address line failure in the first 64 KB of main memory	
1-4-2	Parity failure in the first 64 KB of main memory	
2-1-1 through 2-4-4	Bit failure in the first 64 KB of main memory	
3-1-1	Slave DMA-register failure	
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, replace the keyboard. If the problem persists, replace the system board. See " Getting Help ."
3-3-1	CMOS failure	Replace the system board. See " Getting Help ."
3-3-2	System configuration check failure	
3-3-3	Keyboard controller not detected	
3-3-4	Screen initialization failure	
3-4-2	Screen-retrace test failure	
3-4-3	Search for video ROM failure	
3-4-3	Search for video ROM failure	

4-2-1	No timer tick	
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. If the problem persists, see " Getting Help ."
4-3-3	Defective system board	Replace the system board. See " Getting Help ."
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 ."
4-4-1	Super I/O chip failure (defective system board)	Replace the system board. See " Getting Help ."
4-4-4	Cache test failure (defective microprocessor)	Remove and reseat the specified microprocessor. See " Installing Microprocessors " in "Installing System Board Options." If the problem persists, replace the microprocessor. If the problem persists, see " Getting Help ."
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 or application program for more information on warning messages.

Diagnostics Messages

When you run a test group or subtest in the system 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 Messages

The optional system management software generates alert messages for your system. For example, the server agent software generates messages that appear in the SNMP trap log file. Alert messages consist of information, status, warning, and failure messages for drive, temperature, fan, and power conditions. More information about alert messages is provided in the system management software documentation found on the documentation CD that shipped with your system.

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Finding Software Solutions

Dell™ PowerEdge™ 1650 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 system 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 drive. Viruses can quickly use all available system memory, damage or destroy data stored on the hard 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 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. "[Indicators, 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. Contact 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 the second interrupt controller to enable IRQ8 through IRQ15
IRQ3	Available
IRQ4	Used by serial port 1 (COM1 and COM3)
IRQ5	Used by embedded server management hardware
IRQ6	Used by the diskette drive controller
IRQ7	Available
IRQ8	Used by the real-time clock
IRQ9	Reserved for ACPI if Microsoft® Windows® 2000 operating system is running
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	Used by IDE CD drive controller
IRQ15	Available unless used by IDE hard drive controller
NOTE: For the full name of an abbreviation or acronym used in this table, see " Abbreviations and Acronyms ."	

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Running the System Diagnostics

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

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

Unlike many diagnostic programs, the system 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 a technical assistance representative.



NOTICE: Use the system 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 System Diagnostics

The system 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 System 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 system 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 System Diagnostics

You can run the system diagnostics from either the utility partition on your hard 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.

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 system 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](#)."

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 system diagnostics.



NOTE: Before you read the rest of this section, you may want to start the system 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. You should choose this option first to increase the chance of tracing the source of the problem quickly. To test a particular device, select **Test One Device**. 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**. When you select **Advanced Testing**, the main screen of the diagnostics appears. This screen includes a listing of the various device groups in the system and the system's service tag.

To view data on test results, select **Information and Results**. Select **Program Options** to view the **Program Options** screen, which lets you set various test parameters.

By selecting the **Device Configuration** option, you can see an overview of the devices in the system.

Selecting **Exit to MS-DOS** exits the diagnostics and returns you to the operating system environment (or the utility partition's main menu if you are running the diagnostics from the utility partition).

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 System Diagnostics

When you select **Advanced Testing** 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, the version number, and the system service tag.
- 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 that 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**, **Device**, **Test**, and **Versions**.

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 seven options: One , All , Select , Options , Results , Errors , 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.
Help	Displays a list of help topics.

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; 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™ 1650 Systems Installation and Troubleshooting Guide

- [Safety First—For You and Your System](#)
- [External Connections](#)
- [Checking Basic System Problems](#)
- [Start-Up Routine](#)
- [Checking the Equipment](#)
- [Responding to a System Management Alert Message](#)
- [Inside the System](#)
- [Removing and Replacing the Front Bezel](#)
- [Opening the System Doors](#)
- [Troubleshooting a Wet System](#)
- [Troubleshooting a Damaged System](#)
- [Troubleshooting the System Battery](#)
- [Troubleshooting Redundant Power Supplies](#)
- [Troubleshooting a Cooling Fan](#)
- [Troubleshooting Expansion Cards](#)
- [Troubleshooting System Memory](#)
- [Troubleshooting the System Board](#)
- [Troubleshooting the Diskette Drive](#)
- [Troubleshooting a CD Drive](#)
- [Troubleshooting an External SCSI Tape Drive](#)
- [Troubleshooting SCSI Hard Drives](#)
- [Troubleshooting IDE Hard Drives](#)
- [Troubleshooting the Optional ROMB Card](#)
- [Troubleshooting a RAID Controller Expansion Card](#)

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 Read the "Safety Instructions" in your *System Information* document.
- 1 Read "[Running the System Diagnostics](#)" for information about running diagnostics.
- 1 Get the key to the system keylock (if your system has the optional front bezel).

You may also need to refer to the system *User's Guide* and other system documentation.

Safety First—For You and Your System

The procedures in this guide require that you work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in your system documentation. Always follow the instructions closely. 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.

-  **CAUTION:** The power supplies in this system may produce high voltages and energy hazards, which can cause bodily harm. Only trained service technicians are authorized to open the system 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 system.
-

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 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 Basic System Problems

1. If the system is not receiving power, check that a power cable is attached to power connector PS1 on the system back panel (see [Figure 2-3](#)).
If your system has two power supplies, also check that a second power cable is attached to power connector PS2.
2. Turn off the system, including any attached peripherals, and disconnect all power cables from their electrical outlets.
3. If the system is connected to a PDU, turn the PDU off and then on again.

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

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

5. Is the monitor working properly?

See "[Troubleshooting the Video Subsystem](#)."

6. Is the keyboard working properly?

See "[Troubleshooting the Keyboard](#)."

7. Is the mouse 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 server management software	See the documentation provided with the server management software.
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-drive activity indicators	See " Troubleshooting SCSI Hard 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.

Checking the Equipment

This section provides troubleshooting procedures for equipment that connects directly to the I/O (back) 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 system 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 Keyboard

Problem

- 1 System error message indicates a keyboard problem

 **NOTE:** If you connect a monitor to the video connector on the system's front panel, you can connect a PS/2 keyboard and mouse only to the PS/2 keyboard and mouse connectors on the system front panel. (You can connect a USB keyboard and mouse to any USB port, regardless of where a monitor is connected.)

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 system 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 faulty 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. System error message indicates an I/O port problem
1. Device connected to the port does not function properly

Action

1. Enter the System Setup program (see "Using the System Setup Program" in the *User's Guide* for instructions) and check the port setting.

If the communications port is disabled, go to step 3.

If the communications port is enabled, continue to step 2.

2. Change the port setting to **Auto**, and then reboot the system.
3. Check the port setting in the System Setup program. See "Using the System Setup Program" in the *User's Guide* for instructions.

If the settings are correct, go to step 5.

4. Change the necessary setting in the System Setup program. 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 port test in the system diagnostics.

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

If the test runs successfully but the problem persists, see "[Troubleshooting a Serial I/O Device](#)" or "[Troubleshooting a USB Device](#)," depending on the malfunctioning device.

Troubleshooting a Serial I/O Device

Problem

1. Device connected to the serial port not working

Action

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

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

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

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

Troubleshooting a USB Device

Problem

- 1 System error message indicates problem
- 1 Device connected to the port 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. If possible, swap the interface cable with a known working cable.

If the problem is resolved, the interface cable must be replaced.

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

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

If the problem is not resolved and there is only one USB device connected to the system, go to step 5.

4. Swap the USB device with a comparable device.

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

Troubleshooting the Integrated NICs

Problem

- 1 Integrated NICs cannot communicate with the network

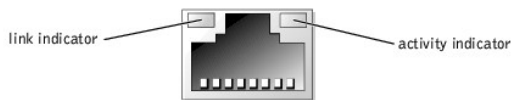
Action

1. Check the two indicators on the left and right corners of the NIC connectors on the system's back panel (see [Figure 5-1](#)).

The green link indicator on the left side of the connector shows that the adapter is connected to a valid link partner. The amber activity indicator is on 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.

Figure 5-1. NIC Indicators



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

Check the drivers and remove and reinstall the drivers if applicable.

You must reboot your system for the reinstalled drivers to become active.

3. Make sure the appropriate drivers are installed and the protocols are bound.
4. Enter the System Setup program and confirm that the NICs are enabled. See "Using the System Setup Program" in the *User's Guide* for instructions.

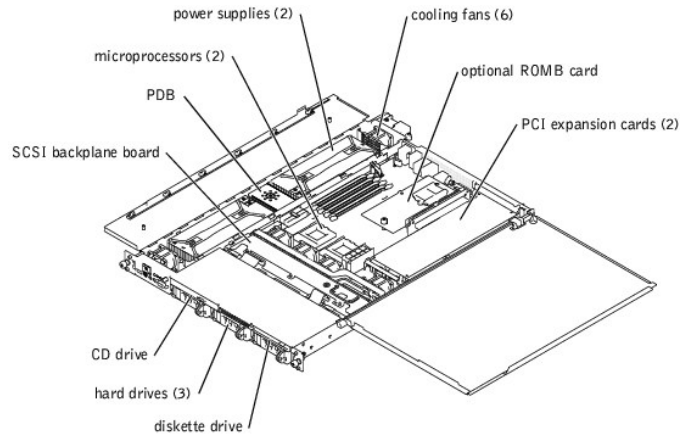
Responding to a System Management Alert Message

The optional system management applications monitor critical system voltages and temperatures, the system cooling fans, and the status of the hard drives in the system. Alert messages appear in the alert log window. For information about the alert log window and options, see your system management software documentation.

Inside the System

In [Figure 5-2](#), the system doors are open and the bezel is removed to provide an interior view of the system.

Figure 5-2. Inside the System



The system board can accommodate one or two microprocessors. A riser board accommodates one or two PCI expansion cards. Up to four memory modules may be installed on the system board.

The hard-drive bays provide space for up to three 1-inch SCSI hard drives or two IDE hard drives. SCSI hard drives are connected to a SCSI host adapter on the system board through the SCSI backplane board. IDE hard drives are connected directly to the system board.

The peripheral bays provide space for an optional 3.5-inch diskette drive and a CD drive.

The power distribution board (PDB) provides hot-plug logic and power distribution for the system. Two hot-pluggable, redundant power supplies provide power to the system board and internal peripherals.

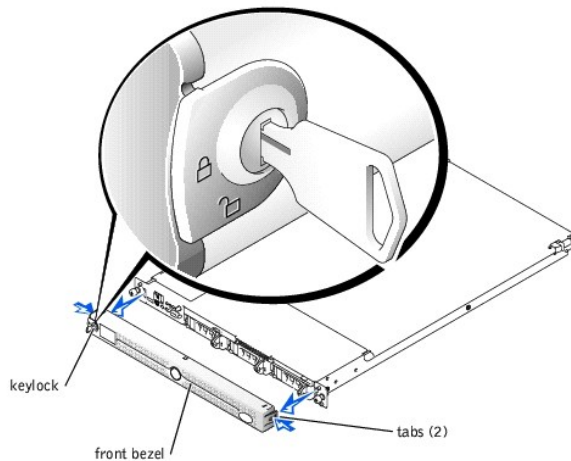
During an installation or troubleshooting procedure, you may be required to change a jumper. For information on the system board jumpers, see "[Jumpers and Connectors](#)."

Removing and Replacing the Front Bezel

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

- 1 To remove the bezel, use the system key to unlock the keylock on the bezel, press the tab at each end of the bezel, and then pull the bezel away from the system (see [Figure 5-3](#)).
- 1 To replace the front bezel, fit the tabs on the bezel into the corresponding slots in the front panel and lock the keylock.

Figure 5-3. Removing and Replacing the Front Bezel



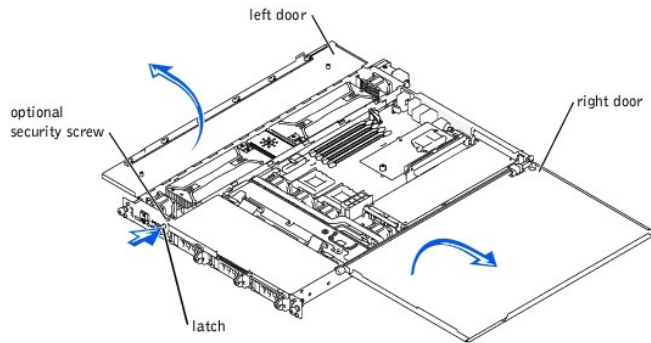
Opening the System Doors

Two doors on the top of the system provide access to the system board and other internal components.

To open the system doors, perform the following steps:

1. Observe the precautions in "[Safety First—For You and Your System](#)," found earlier in this section. Also observe the safety instructions in the *System Information* document.
2. Slide the system out of the rack.
3. If the front bezel is installed, remove the front bezel (see "[Removing and Replacing the Front Bezel](#)").
4. If the optional security screw is installed on the system cover (see [Figure 5-4](#)), remove it now.

Figure 5-4. Opening the System Doors



5. Press the latch on the system front panel and lift the left door.
6. Lift the right door.

When closing the doors, be sure to close the right door first and then the left door.

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. Open the system doors (see "[Opening the System Doors](#)").
3. Remove all expansion cards installed in the system (see "[Installing Expansion Cards](#)" in "Installing System Board Options").
4. Let the system dry thoroughly for at least 24 hours.
5. Close the system doors, 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 (see "[Installing Expansion Cards](#)" in "Installing System Board Options").
7. Run the system board tests in the system 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 system 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 system configuration information
- 1 System date and time do not stay current

Action

1. Re-enter 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 the system to the electrical outlet 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 (see ["Replacing the System Battery"](#)).

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

- 🚫 **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.

Troubleshooting Redundant Power Supplies

Problem

- 1 Front-panel amber fault indicator or bezel amber caution indicator is on
- 1 Power supply red fault indicator is on

Action

1. Open the left system door (see ["Opening the System Doors"](#)).

- ⚠️ **CAUTION:** The power supplies are hot-pluggable. Remove and replace only one power supply at a time.
 - ⚠️ **CAUTION:** The connectors on the PDB contain high voltages. Do not remove the metal cover from the PDB or touch the connectors on the PDB or power supply.
2. Identify the failed supply using the red fault indicator on the top of the supply (see [Figure 2-5](#) in ["Indicators, Messages, and Codes"](#)).
 - ⚠️ **CAUTION:** Disconnect the AC cord for the failed power supply before removing the power supply. (To identify the correct power connector, see [Figure 2-3](#) in ["Indicators, Messages, and Codes."](#))
 3. While grasping the power supply handle, slide the power supply away from the PDB 0.75 inch (2 cm), and then lift the power supply out of the chassis (see [Figure 5-5](#)).

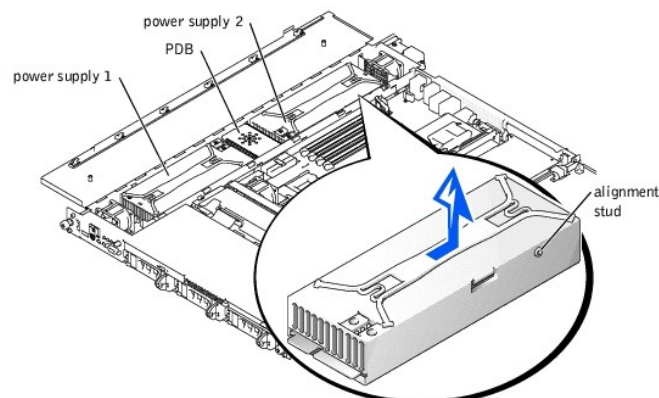


Figure 5-5. Removing a Power Supply

4. To install the replacement power supply, align the stud on the side of the power supply (see [Figure 5-5](#)) with the corresponding notch in the chassis, and then lower the power supply into the chassis.
5. Slide the power supply toward the PDB until the power supply connector is fully seated in the PDB connector.

Troubleshooting a Cooling Fan

Problem

1. Front-panel amber fault indicator or bezel amber caution indicator is on
1. The server management application program issues a fan-related error message

Action

1. Open the system doors (see "[Opening the System Doors](#)").

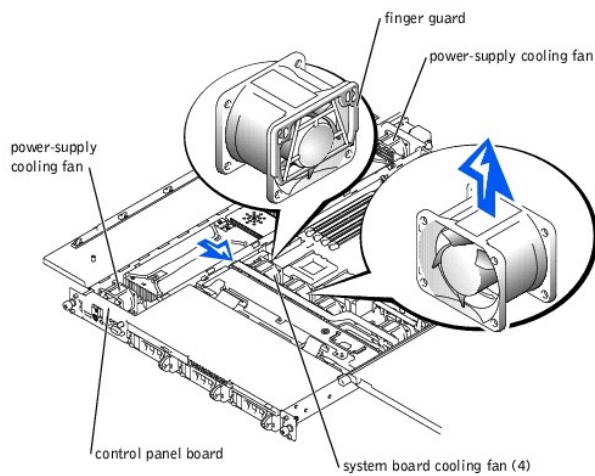
⚠ CAUTION: The cooling fans are hot-pluggable. To maintain proper cooling while the system is on, replace only one fan at a time.

2. Locate the faulty fan.

The amber fault indicator adjacent to the fan power connector blinks if the fan is faulty.

3. Check the cooling fan power cable connection on the system board or control panel board (see [Figure 5-6](#)).

Figure 5-6. Cooling Fan



4. If the problem is not resolved, install a replacement cooling fan.
 - a. Disconnect the fan power cable from the system board or control panel board.
 - b. Lift the defective fan straight up out of the power-supply bay or fan bracket (see [Figure 5-6](#)).
 - c. Insert the new fan into the power-supply bay or fan bracket.

When replacing the fan bracket, ensure that the finger guard on the fan faces the back of the system and that the label on the fan faces upward (see [Figure 5-6](#)).

- d. Connect the fan power cable to the system board or control panel board.
5. If the replacement fan does not operate, the control panel, control panel cable, or system board is faulty (see "[Getting Help](#)" for information on obtaining technical assistance).

🔧 NOTE: After installing a new fan, allow up to 30 seconds for the system to recognize the fan and determine whether it is working properly.

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. Shut down the system and open the system doors (see "[Opening the System Doors](#)").
2. Verify that each expansion card is firmly seated in its connector.
3. Verify that the expansion-card riser board is seated in its connector on the system board.
4. Verify that any appropriate cables are firmly connected to their corresponding connectors on the expansion cards.
5. Close the system doors and turn on the system.
6. Run the **Quick Tests** in the system diagnostics.

If the problem still exists, go to step 7.

7. Shut down the system and open the system doors (see "[Opening the System Doors](#)").
8. Remove all expansion cards installed in the system.
9. Run the **Quick Tests** in the system diagnostics.

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

10. Shut down the system and reinstall one of the expansion cards you removed in step 8.
11. Close the system doors and start up the system.
12. Run the **Quick Tests** in the system diagnostics.
13. Repeat steps 9 through 12 until all expansion cards are installed.

If you have reinstalled all of the expansion cards and the **Quick 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 system, including any attached peripherals.

If there are no error messages, go to step 14.

2. Enter the System Setup program to check the indicated system memory (see "Using the System Setup Program" in the *User's Guide* for instructions).
3. If the amount of memory matches the installed system memory, go to step 14.
4. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
5. Open the system doors (see "[Opening the System Doors](#)").

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

6. Reseat the memory modules in their sockets.
7. Close the system doors, reconnect the system to power, and turn on the system.
8. Enter the System Setup program and check the system memory again.
9. If the amount of memory installed does not match the system memory setting, 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 remains blank and the Num Lock, Caps Lock, and Scroll Lock indicators on the keyboard remain on, continue to step 10.

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 14.

10. Turn off the system and open the system doors (see "[Opening the System Doors](#)").
11. Swap the memory module pair in bank 1 (DIMM_A and DIMM_B) with another known good pair of the same capacity.
12. Close the system doors and reconnect the system to power.
13. Reboot the system, and observe the monitor screen and the indicators on the keyboard.

If the problem still exists, repeat steps 10 through 13 if additional memory is installed.

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

14. Run the system memory test in the system diagnostics.

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

Troubleshooting the System Board

Problem

- 1 Error message indicates system board problem

Action

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. Open the system doors (see "[Opening the System Doors](#)").
3. Remove all expansion cards.
4. Close the system doors.
5. Run the **Quick Tests** in the system diagnostics.

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

6. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
7. Reinstall one of the expansion cards that you removed in step 3.
8. Connect the system to its electrical outlet and turn on the system, including any attached peripherals.
9. Run the **Quick Tests** again.

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

10. Repeat steps 6 through 9 if you removed an additional expansion card in step 3.

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 indicates a diskette drive problem

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*).
2. Run the diskette drive tests from the diagnostics diskette 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. Open the system doors (see "[Opening the System Doors](#)").
5. Verify that the diskette drive interface cable is securely connected between the back of the diskette drive and the SCSI backplane board or system board.
6. Close the system doors (see "[Opening the System Doors](#)").
7. Connect the system to its electrical outlet and turn on the system, including any attached peripherals.
8. Run the diskette drive tests in the system diagnostics to determine whether the diskette drive works correctly.
9. If the drive still does not work, remove all expansion cards (see "[Installing Expansion Cards](#)" in "Installing System Board Options").
10. Run the diskette drive tests from the system diagnostics diskette 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 11.

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

11. Reinstall one of the expansion cards you removed in step 9 (see "[Installing Expansion Cards](#)" in "Installing System Board Options").
12. Restart the system and run the diskette drives test in the system diagnostics to determine whether the diskette drive subsystem now works correctly.
13. Repeat steps 11 and 12 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 Drive

Problem

- 1 System cannot read data from a CD
- 1 CD drive 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 system doors (see "[Opening the System Doors](#)").
3. Verify that the CD drive interface cable is securely connected between the back of the CD drive and the SCSI backplane board or system board.
4. Connect the system to its electrical outlet and turn on the system, including any attached peripherals.
5. Enter the System Setup program to check that the IDE device is enabled (see "Using the System Setup Program" in the *User's Guide*).
6. Run the IDE devices test in the system diagnostics to determine whether the CD 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

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 drive and are configured correctly.

For instructions on installing and configuring device drivers for the system's integrated SCSI host adapter, see "Using the Dell OpenManage Server Assistant CD" in the *User's Guide*.

For a SCSI host adapter card, see the documentation that accompanied the card.

3. Reinstall the tape-backup software as instructed in the tape-backup software documentation.
 4. 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 and 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 and reinstall the tape drive.
 - e. Replace the SCSI cable that connects the tape drive to the SCSI host adapter.
 - f. Reconnect the system to the electrical outlet and turn on the system.
 5. If the problem is not resolved, see "[Getting Help](#)" for instructions on obtaining technical assistance.
-

Troubleshooting SCSI Hard Drives


Problem

- 1 The drive itself
- 1 SCSI backplane board


Systems with a ROMB card issue the following signals by using the drive indicator lights:

- 1 If a drive shows signs of imminent failure, the power-on/fault indicator slowly blinks green, amber, and off.
- 1 If a drive has failed, the amber power-on/fault indicator blinks four times per second.

Action

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

1. Reboot the system and press <Ctrl><a> to enter the SCSI configuration utility program.

 **NOTE:** If your system has an RAID controller card installed, reboot the system and press <Ctrl><h>, <Ctrl><a>, or <Ctrl><m>, depending on the utility. See the documentation supplied with the controller for information on the configuration utility.

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 operating system's documentation).
4. Remove the hard drive and install it in the another drive bay.
5. If the problem is resolved, reinstall the hard drive in the original bay.

If the hard drive functions properly in the original bay, the drive carrier could have intermittent problems. Replace the drive carrier (see "[Connecting External SCSI Hard Drives](#)").

If the drive carrier still does not function properly in the original bay, the SCSI backplane board has a defective connector (see "[Getting Help](#)" for instructions on obtaining technical assistance).

6. Partition and logically format the hard drive. If possible, restore the files to the drive.

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


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

Troubleshooting IDE Hard Drives

Problem

- 1 The drive itself
- 1 IDE controller on the system board
- 1 The IDE drive data and power cables

Action

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

1. Reboot the system and press <F2> to enter the System Setup program.
2. Check the system configuration settings for the installed hard drive(s).
3. If necessary, correct the settings, and then reboot the system.
4. Check the cable connections inside the system:
 - a. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
 - b. Open the system doors (see "[Opening the System Doors](#)").
 - c. Check the power cable and data cable connections to the IDE drive and the system board.
 - d. Reconnect the system to the electrical outlet and turn on the system.
5. If the problem is not resolved, partition and logically format the hard drive. If possible, restore the files to the drive.

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

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

Troubleshooting the Optional ROMB Card

Problem


- 1 Error message indicates a ROMB card problem

Action


1. Enter the System Setup program and check the setting for the ROMB card (see "Using the System Setup Program" in the *User's Guide*).

If the controller is enabled, go to step 4.

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

 **CAUTION:** 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 system doors (see "[Opening the System Doors](#)").

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

6. Reseat the ROMB card in its socket (see "[Installing a ROMB Card](#)" in "Installing System Board Options").

See [Figure 6-1](#) for the location of the ROMB card.

7. Check that the back-up battery power cable is attached to the connector on the ROMB card.
8. Close the system doors, 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 Expansion Card

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

[Back to Contents Page](#)

Installing System Board Options

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

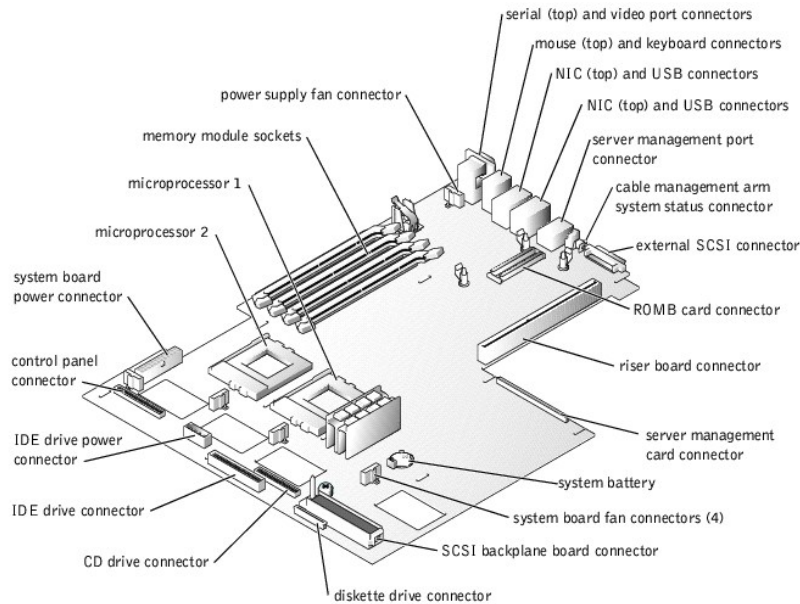
- [Installing Expansion Cards](#)
- [Installing Memory](#)
- [Installing Microprocessors](#)
- [Installing a ROMB Card](#)
- [Replacing the System Battery](#)

This section describes how to install expansion cards, memory modules, a microprocessor, or a ROMB card. This section also includes instructions for replacing the system battery. Use [Figure 6-1](#) to locate the system board features. [Table 6-1](#) describes the system board connectors and sockets.

Table 6-1. System Board Connectors and Sockets

Connector or Socket	Description
BACKPLANE	SCSI backplane board connector
<i>BANK_n_DIMM_x</i>	Memory module sockets
BATTERY	System battery connector
CDROM	CD drive connector
EMBEDDED_REMOTE_ASSISTANT	Connector for optional server management card (when available)
ERA_NIC	server management port connector (when available)
ETHERNET_USB _n	USB (top) and NIC connectors
FAN _n	Cooling fan power connectors
FLOPPY	Diskette drive connector
FRONT PANEL	System control panel connector
IDE	IDE drive connector
IDE_POWER	IDE drive power connector
KYBD_MOUSE	Mouse (top) and keyboard connectors
POWER	Power connector
PROCESSOR <i>n</i>	Microprocessor sockets
RAID	Socket for optional ROMB card
REAR_ID	cable management arm system status connector
RISER	PCI riser board connector
SCSI_B	External SCSI connector
NOTE: For the full name of an abbreviation or acronym used in this table, see " Abbreviations and Acronyms ."	

Figure 6-1. System Board Connectors and Sockets



Installing Expansion Cards

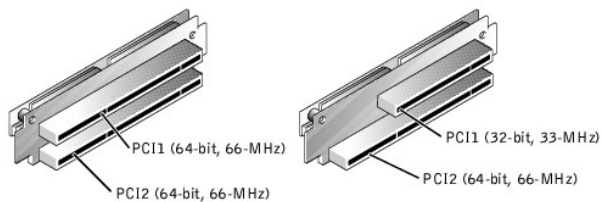
Expansion cards are installed on the system's riser board (see [Figure 6-2](#)). The riser board plugs into the RISER connector on the system board (see [Figure 6-1](#)) and is considered an extension of the system board.

Your system is available with two different riser board configurations (see [Figure 6-2](#)):

- 1 Two 64-bit, 66-MHz expansion slots
- 1 One 64-bit, 66-MHz expansion slot (PCI2) and one 32-bit, 33-MHz expansion slot (PCI1) for 5-V cards

You can install only half-length PCI cards in the lower expansion slot (PCI2). You can install a full-length expansion card in the upper expansion slot (PCI1) unless you have installed an optional server management card. In this case, neither slot will accommodate full-length cards.

Figure 6-2. Riser-Board Expansion-Card Connectors



Installing an Expansion Card

To install an expansion card, perform the following steps.

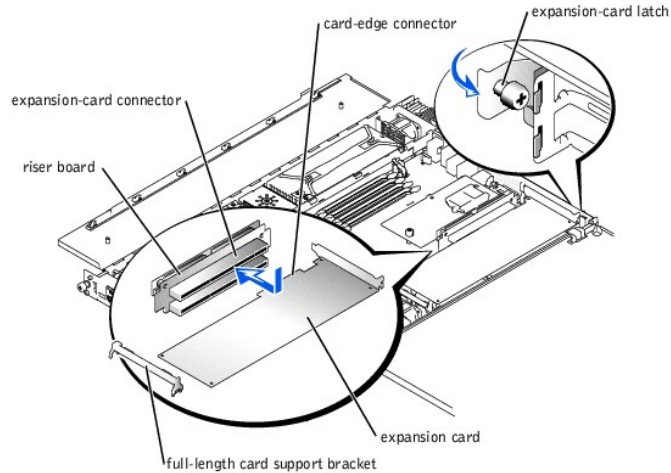
⚠ CAUTION: Before you perform this procedure, you must turn off the system and disconnect it from its power source. For more information, see "[Safety First—For You and Your System](#)" in "Troubleshooting Your System."

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
2. Prepare the expansion card for installation, and open the system doors (see "[Opening the System Doors](#)" in "Checking Inside the System").

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.

3. Remove the expansion-card latch by loosening the captive thumbscrew and removing the latch (see [Figure 6-3](#)).

Figure 6-3. Installing an Expansion Card



4. Remove the filler bracket from the expansion slot.
5. Install the new expansion card:
 - a. Lower the card into the system.

If the card is a full-length card, you may need to guide the front edge of the card into the full-length card support bracket (see [Figure 6-3](#)).
 - b. Insert the card-edge connector firmly into the expansion-card connector on the riser board until the card is fully seated.
6. When the card is seated in the connector, replace and secure the expansion-card latch.
7. Connect any cables that should be attached to the card.

See the documentation supplied with the card for information about its cable connections.
8. Close the system doors, reconnect the system and peripherals to their electrical outlets, and turn them on.

Removing an Expansion Card

To remove an expansion card, perform the following steps.

⚠ CAUTION: 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 its electrical outlet.
2. Open the system doors (see ["Opening the System Doors"](#) in ["Checking Inside the System"](#)).
3. Disconnect any cables connected to the card.
4. Remove the expansion-card latch by loosening the captive thumbscrew and removing the latch (see [Figure 6-2](#)).
5. Grasp the expansion card by its edges, and remove it from the expansion-card connector.
6. 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.

7. Replace and secure the expansion-card latch.
8. Close the system doors, reconnect the system and peripherals to their electrical outlets, and turn them on.

Installing Memory

The four memory module sockets on the system board (see [Figure 6-1](#)) can accommodate from 256 MB to 4 GB of registered synchronous dynamic random-access memory (SDRAM).

Memory Upgrade Kits

The system is upgradable to 4 GB by installing combinations of 128-, 256-, 512-MB, or 1-GB registered memory modules. You can purchase memory upgrade kits as needed.

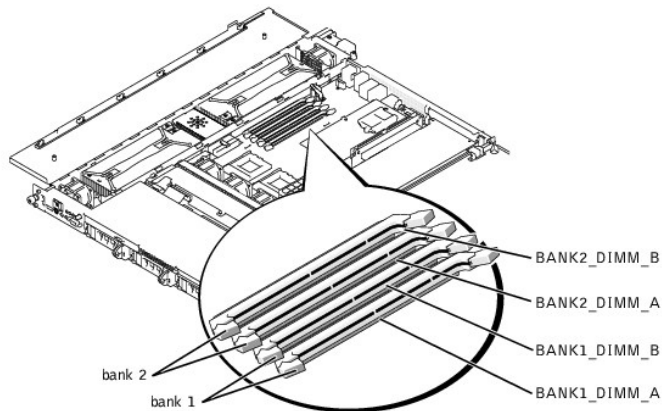
🔧 NOTE: The memory modules must be PC-133 compliant.

Memory Module Installation Guidelines

Starting with the socket farthest from the system power supply bay, the memory module sockets are labeled BANK1_DIMM_A, BANK1_DIMM_B, BANK2_DIMM_A, and BANK2_DIMM_B (see [Figure 6-4](#)). 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 bank 1 before installing a second pair in bank 2.

Figure 6-4. 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	BANK1		BANK2	
	DIMM_A	DIMM_B	DIMM_A	DIMM_B
256 MB	128 MB	128 MB	none	none
512 MB	256 MB	256 MB	none	none
1 GB	256 MB	256 MB	256 MB	256 MB
4 GB	1 GB	1 GB	1 GB	1 GB

Performing a Memory Upgrade

To perform a memory upgrade to the system board, perform the following steps.

⚠ CAUTION: 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. Open the system doors (see "[Opening the System Doors](#)" in "Checking Inside the System").
2. Locate the memory module sockets in which you will install or replace memory modules.

[Figure 6-1](#) shows the general location of the memory module sockets on the system board. [Figure 6-4](#) shows the order of the memory module sockets.

3. Install or replace the memory modules as necessary to reach the desired memory total (see "[Installing Memory Modules](#)" or "[Removing Memory Modules](#)").
4. Close the system doors, reconnect the system to the electrical outlet, and turn on the 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 and displays an error message.

5. Press <F2> to enter the System Setup program, and check the **System Memory** setting on the System Setup screens.

The system should have already changed the value in the **System Memory** setting to reflect the newly installed memory.

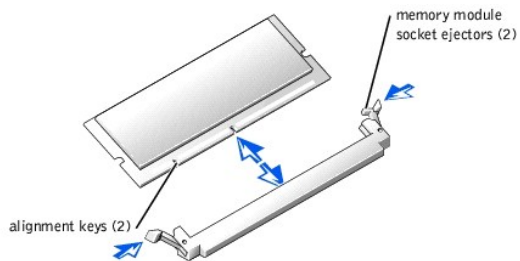
6. If the **System Memory** value is incorrect, one or more of the memory modules may not be installed properly. Repeat steps 1 through 5, checking to make sure that the memory modules are firmly seated in their sockets.
7. Run the system memory test in the system diagnostics.

Installing Memory Modules

To install a memory module, perform the following steps:

1. Press down and outward on the ejectors on the memory module socket, as shown in [Figure 6-5](#), to allow the memory module to be inserted into the socket.

Figure 6-5. Installing a Memory Module



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

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

3. 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 6-5](#)).

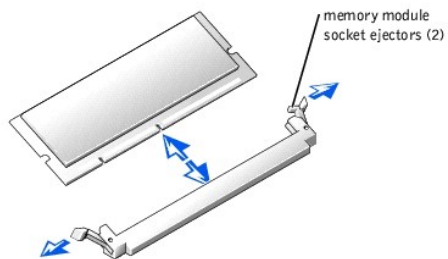
When the memory module is properly seated in the socket, the ejectors on the memory module socket should align with the ejectors on the other sockets with memory modules installed.

4. Repeat steps 1 through 3 of this procedure to install the remaining memory modules.
5. Perform steps 4 through 7 of "[Performing a Memory Upgrade](#)."

Removing Memory Modules

To remove a memory module, press down and outward on the ejectors on each end of the socket until the memory module pops out of the socket (see [Figure 6-6](#)).

Figure 6-6. Removing a Memory Module



Installing Microprocessors

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

NOTICE: The second microprocessor must be of the same type and speed as the first microprocessor.

Each microprocessor and its associated level 2 (L2) cache memory are contained in a FC-PGA2 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 microprocessor connector.

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 microprocessor must have the same operating frequency and cache size as the primary microprocessor.

The following items are included in the microprocessor upgrade kit:

- 1 A microprocessor chip
- 1 A heat sink
- 1 A retention clip

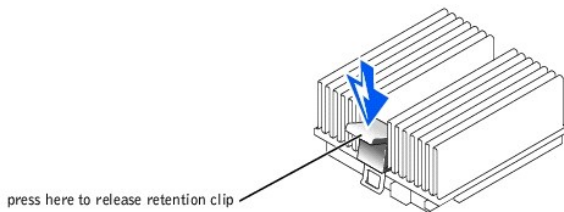
⚠ CAUTION: Before you perform this procedure, you must turn off the system and disconnect it from its electrical outlet. For more information, see "[Safety First— For You and Your System](#)" in "Checking Inside the System."

1. Turn off the system, including any attached peripherals, and disconnect the system from its electrical outlet.
1. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your the System").
2. To remove the retention clip that secures the heat sink to the microprocessor socket, press down firmly on the tab on the retention clip, and then remove the clip from the heat sink (see [Figure 6-7](#)).

➡ NOTICE: 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.

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

Figure 6-7. Retention Clip



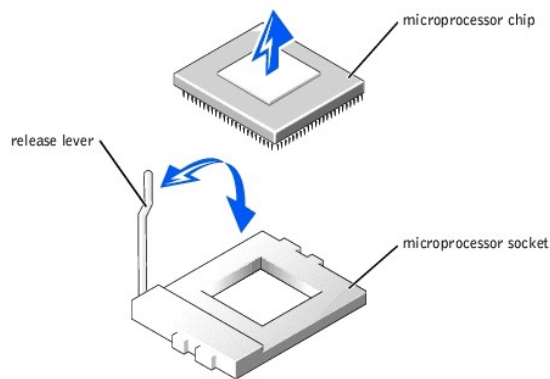
3. Remove the heat sink.

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

4. Remove the microprocessor chip from the socket by pulling the socket release lever straight up until the chip is released (see [Figure 6-8](#)) and then lift the chip out of the socket.

Leave the release lever up so that the socket is ready for the new microprocessor.

Figure 6-8. Removing the Microprocessor



➡ NOTICE: Be careful not to bend any of the pins when unpacking the microprocessor chip. Bending the pins can permanently damage the microprocessor chip.

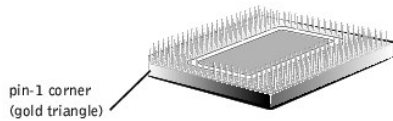
5. Unpack the new microprocessor.

If any of the pins on the microprocessor appear bent, see "[Getting Help](#)" for instructions on obtaining technical assistance.

➡ NOTICE: Identifying the pin-1 corners is critical to positioning the chip correctly.

6. Identify the pin-1 corner of the microprocessor by turning the chip over and 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 triangular pad.
7. Align the pin-1 corner of the microprocessor chip (see [Figure 6-9](#)) with the pin-1 corner of the microprocessor socket.

Figure 6-9. Pin-1 Identification



➔ **NOTICE:** Positioning the microprocessor incorrectly can permanently damage the chip and the system when you turn on the system.

8. Install the microprocessor chip in the socket (see [Figure 6-10](#)).

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

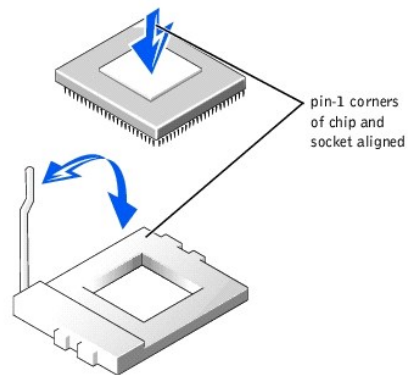
➔ **NOTICE:** When placing the microprocessor chip in the socket, be sure that all of the pins on the chip go into the corresponding holes of the socket. Be careful not to bend the pins.

- b. With the pin-1 corners of the chip and socket aligned, set the chip lightly in the socket and make sure that all pins are matched with the correct holes in the socket.

Because the system uses a ZIF microprocessor socket, *there is no need to use force* (which could bend the pins if the chip is misaligned). When the chip is positioned correctly, it should drop down into the socket with minimal pressure.

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

Figure 6-10. Installing the Microprocessor Chip

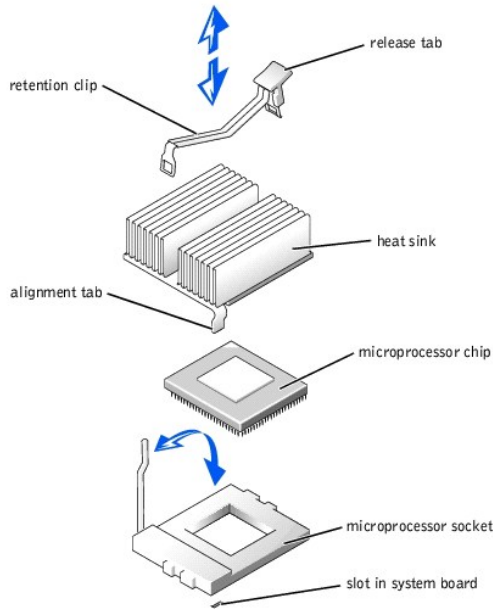


9. Place the new heat sink on top of the microprocessor chip (see [Figure 6-11](#)).

10. Replace the retention clip:

- a. Orient the clip so that the release tab is facing the back of the system.
- b. Hook the unfolded end of the clip over the tab on the edge of the socket facing the front of the system.
- c. Press down on the release tab on the free end of the clip to snap the clip over the tab on the socket (see [Figure 6-11](#)).

Figure 6-11. Installing the Heat Sink



11. Close the system doors.
12. Reconnect your system and peripherals to their electrical outlets, and turn them on.

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

13. Press <F2> to enter the System Setup program, and check that the microprocessor categories match the new system configuration (see the system's *User's Guide* for instructions).
14. Run the system diagnostics to verify that the new microprocessor is operating correctly.

See "[Running the System Diagnostics](#)" for information on running the diagnostics and troubleshooting any problems that may occur.

Installing a ROMB Card

CAUTION: 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.

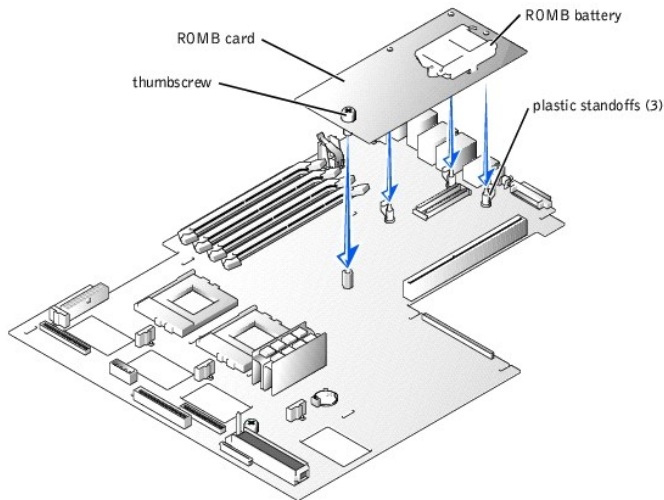
NOTICE: To avoid possible data loss, back up all data on the hard drives before changing the mode of operation of the integrated SCSI controller from SCSI to RAID.

NOTE: The ROMB card supports only SCSI drives connected to the SCSI backplane. The ROMB card does not support external SCSI drives or internal IDE drives.

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
3. Locate the ROMB card connector on the system board (see [Figure 6-1](#)).
4. Align the edges of the ROMB card with the three plastic standoffs on the system board (see [Figure 6-12](#)) and install the card.

When the card is fully seated, the three plastic standoffs will snap over the edge of the card.

Figure 6-12. Installing the ROMB Card



5. Secure the ROMB card with the thumbscrew (see [Figure 6-12](#)).
6. Check that the ROMB back-up battery (see [Figure 6-12](#)) is connected to the ROMB card.
7. If necessary, connect the ROMB battery cable.
8. Close the system covers.
9. Reconnect the system and peripherals to their power sources, and turn them on.
10. Enter the System Setup program and verify that the setting for the SCSI controller has changed to reflect the presence of the RAID hardware (see "Using the System Setup Program" in your *User's Guide*).
11. Install the RAID software (see the ROMB card software documentation for more information).

Replacing the System Battery

The system battery is a 3.0-V, coin-cell battery that 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.

You can operate the system without a battery; however, the system configuration information maintained by the battery in NVRAM is erased each time you remove power from the system. Therefore, you must reenter the system configuration information and reset the options each time the system boots until you replace the battery.

To replace the battery, perform the following steps.

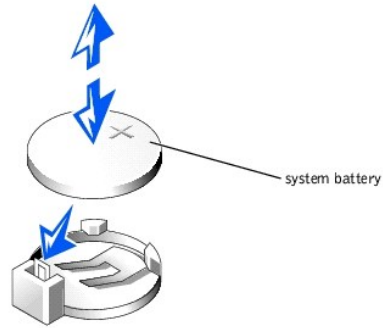
- CAUTION:** Before you perform this procedure, you must turn off the system and disconnect it from its power source. See "Protecting Against Electrostatic Discharge" in the safety instructions in your *System Information* document.
- CAUTION:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

1. Enter the System Setup program and, if possible, make a printed copy of the System Setup screens (see "Using the System Setup Program" in the *User's Guide*).
2. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
3. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
4. Remove the system battery (see [Figure 6-1](#) for its location).

You can pry the system battery out of its socket with your fingers or with a blunt, nonconductive object such as a plastic screwdriver.

5. Install the new system battery with the side labeled "+" facing up (see [Figure 6-13](#)).

Figure 6-13. Installing the System Battery



6. Close the system doors.
7. Reconnect the system and any attached peripherals to their electrical outlets, and turn them on.
8. Enter the System Setup program to confirm that the battery is operating properly (see "Using the System Setup Program" in the *User's Guide*).
9. Enter the correct time and date in the System Setup program's **Time** and **Date** settings.
10. Re-enter 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 its electrical source for at least an hour.
12. After an hour, connect the system to its electrical source and turn on the power.
13. Enter the System Setup program and if the time and date are still incorrect, see "[Getting Help](#)" for instructions on obtaining technical assistance.

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Installing Drives

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

- [Installing SCSI Hard Drives](#)
- [Installing an IDE Hard Drive](#)
- [Installing a CD Drive](#)
- [Installing a Diskette Drive](#)
- [Connecting External SCSI Hard Drives](#)
- [Connecting an External SCSI Tape Drive](#)
- [Configuring the Boot Device](#)

Your system features an internal hard-drive bay that contains up to three SCSI hard drives or two IDE hard drives. Your system also features two peripheral bays that can be used for an optional CD drive and a 3.5-inch diskette drive. This section contains instructions for replacing these devices as well as upgrading the system by installing a host adapter card.

Installing SCSI Hard Drives

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

The internal hard-drive bays provide space for up to three 1-inch SCSI hard drives. These drives connect to the system board via a SCSI backplane board.

Before You Begin

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

- ➔ **NOTICE:** Before attempting to remove or install a drive while the system is running, see the documentation for the host adapter to ensure that the host adapter is configured correctly to support hot-pluggable drive removal and insertion.
- 🔧 **NOTE:** It is recommended that you use only drives that have been tested and approved for use with the SCSI backplane board.

You may need to use different programs than those provided with the operating system to partition and format SCSI hard drives.

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

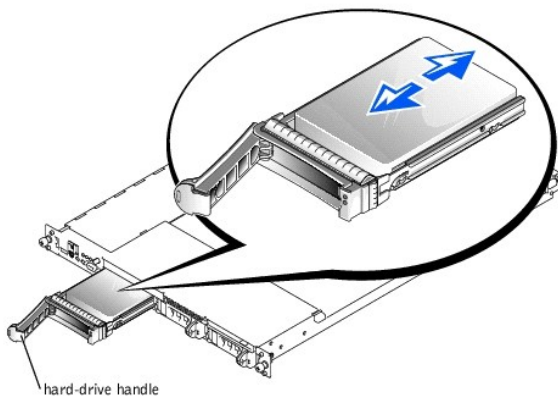
When you format a high-capacity SCSI hard drive, allow enough time for the formatting to be completed. Long format times for these drives are normal. A 9-GB hard drive, for example, can take up to 2.5 hours to format.

Installing a SCSI Hard Drive

- ➔ **NOTICE:** Hot-plug drive installation is not supported for systems without the optional ROMB card.

1. If the system does not have a ROMB card installed, shut down the system.
2. Remove the front bezel, if attached (see ["Removing and Replacing the Front Bezel"](#) in "Troubleshooting Your System").
3. Open the hard-drive handle (see [Figure 7-1](#)).

Figure 7-1. Installing a SCSI Hard Drive



4. Insert the hard drive into the drive bay (see [Figure 7-1](#)).

5. Close the hard-drive handle to lock the drive in place.
6. Replace the front bezel, if it was removed in step 2.
7. Install any required SCSI device drivers (see "Installing and Configuring SCSI Drivers" in the *User's Guide* for information).
8. If the hard drive is a new drive, run the **SCSI Controllers** test in the system diagnostics.

Removing a SCSI Hard Drive

NOTICE: Hot-plug drive installation is not supported for systems without the optional ROMB card.

1. If the system does not have a installed, shut down the system.
2. For systems with a ROMB card, power down the hard-drive bay and wait until the SCSI hard-drive indicators on the drive carrier signal that the drive can be removed safely.

If the drive has been online, the green power on/fault indicator will flash as the drive is powered down. When both drive indicators are off, the drive is ready for removal.

3. Remove the front bezel, if attached (see "[Removing and Replacing the Front Bezel](#)" in "Troubleshooting Your System").
4. Open the hard-drive handle to release the drive.
5. Slide the hard drive out until it is free of the drive bay.
6. Replace the front bezel, if it was removed in step 3.

Installing an IDE Hard Drive

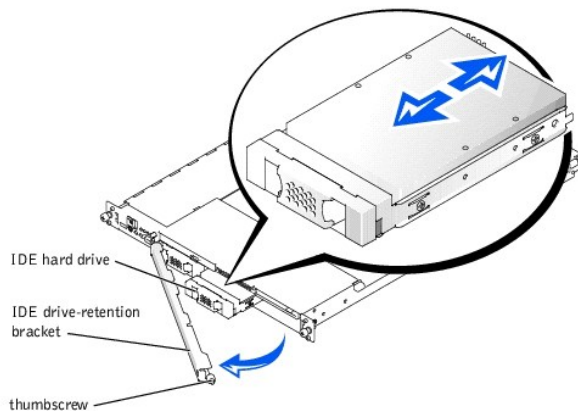
This subsection describes how to install an IDE hard drive in the internal hard-drive bays of a system configured for IDE hard drives.

NOTICE: IDE hard drive installation is not supported in systems with a SCSI backplane board.

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

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the front bezel, if attached (see "[Removing and Replacing the Front Bezel](#)" in "Troubleshooting Your System").
3. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
4. Loosen the thumbscrew securing the drive-retention bracket to the chassis (see [Figure 7-2](#)).

Figure 7-2. Installing an IDE Hard Drive



5. Rotate the right end of the drive-retention bracket away from the system's front panel (see [Figure 7-2](#)).
6. If a filler plate is installed in the drive bay, remove it.
7. Insert the IDE hard drive into the drive bay (see [Figure 7-2](#)).
8. Connect the IDE data cable to the drive and to the IDE connector on the system board (see [Figure 6-1](#) for the location).
9. Connect the IDE power Y-cable to the drive and to the IDE_POWER connector on the system board (see [Figure 6-1](#) for the location).
10. Reinstall the IDE drive retention bracket and secure it with the thumbscrew.
11. Close the system doors.

12. Replace the front bezel, if it was removed in step 2.

Installing a CD Drive

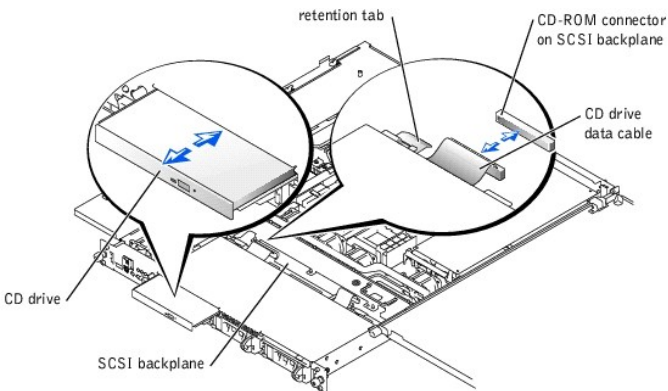
The optional CD drive is contained in a carrier that slides into the peripheral bay.

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

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the front bezel, if attached (see "[Removing and Replacing the Front Bezel](#)" in "Troubleshooting Your System").
3. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
4. If a filler plate is installed in the drive bay, remove it now.
5. If the drive carrier and the drive were supplied separately, install the drive in the carrier:
 - a. Match the edge of the carrier with the retention tab (see [Figure 7-3](#)) with the back edge of the drive.
 - b. Fit the right edge of the drive into the carrier, and then lower the left edge of the drive into the carrier until the drive snaps into place.
6. Slide the drive into the peripheral bay (see [Figure 7-3](#)) until it is fully inserted.

Be careful not to damage the CD drive data cable when inserting the drive.

Figure 7-3. Installing a CD Drive



7. Replace the front bezel, if it was removed in step 2.
8. Connect the CD drive data cable to the connector labeled "CD-ROM" on the SCSI backplane (or on the system board, if your system has IDE hard drives installed).
9. Close the system doors.
10. Replace the front bezel, if it was removed in step 2 (see "[Removing and Replacing the Front Bezel](#)" in "Troubleshooting Your System").
11. Reconnect the system and peripherals to their electrical outlets.

Installing a Diskette Drive

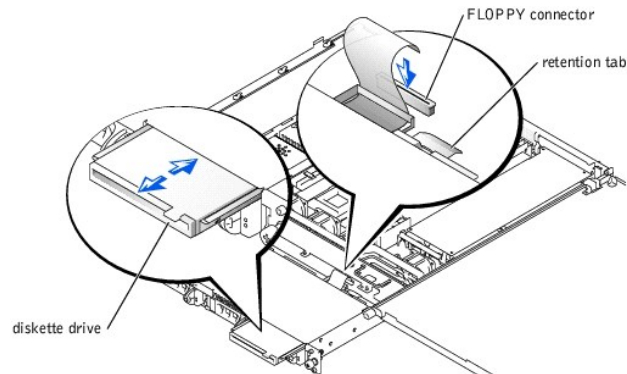
The optional diskette drive is contained in a carrier that slides into the peripheral bay. Perform the following steps to install a diskette drive.

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

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the front bezel, if attached (see "[Removing and Replacing the Front Bezel](#)" in "Troubleshooting Your System").
3. Open the system doors (see "[Opening the System Doors](#)" in "Troubleshooting Your System").
4. If a filler plate is installed in the drive bay, remove it now.
5. If the carrier and the drive were supplied separately, install the drive in the carrier:
 - a. Match the edge of the carrier with the retention tab (see [Figure 7-4](#)) with the back edge of the drive.
 - b. Fit the left edge of the drive into the carrier, then lower the right edge of the drive into the carrier until the drive snaps into place.
6. Slide the drive into the peripheral bay (see [Figure 7-4](#)) until it is fully inserted.

Ensure that you do not damage the ribbon cable at the back of the drive.

Figure 7-4. Installing a Diskette Drive



7. Connect the drive data cable to the connector labeled "FLOPPY" on the SCSI backplane (or system board, if your system has IDE hard drives installed).
8. Close the system doors.
9. Replace the front bezel, if it was removed in step 2 (see ["Removing and Replacing the Front Bezel"](#) in "Troubleshooting Your System").
10. Reconnect the system and peripherals to their electrical outlets.

Connecting External SCSI Hard Drives

Follow these general guidelines when connecting external SCSI hard drives to the external SCSI connector on the system's back panel or to a SCSI controller card.

- CAUTION:** 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. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. If you are installing a SCSI controller card, install the card now (see ["Installing Expansion Cards"](#) in "Installing System Board Options").
3. Connect the external SCSI devices to the external SCSI connector on the system's back panel.

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

4. Reconnect the system to an electrical outlet and turn it on.
5. Connect the external device(s) to electrical outlet(s) and turn them on.
6. Install any required SCSI device drivers (see "Installing and Configuring SCSI Drivers" in the *User's Guide*).
7. Test the SCSI devices.

Connecting an External SCSI Tape Drive

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

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

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. 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 documentation that came with the drive.
3. Unpack the tape drive and controller card and configure the tape drive according to the documentation that came with the tape drive, based on the following guidelines:
 - a. Each device attached to a SCSI host adapter must have a unique SCSI ID number. (Narrow SCSI devices use IDs 0 to 7; wide SCSI devices use IDs from 0 to 15).

A SCSI tape drive is typically configured as SCSI ID 6.

- 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.

- b. SCSI logic requires that the two devices at opposite ends of a SCSI chain be terminated and that all devices in between be unterminated.

Therefore, you should enable the tape drive's termination if it is the last device in a chain of devices (or sole device) connected to the SCSI controller.

4. Install the controller card in an expansion slot (see "[Installing Expansion Cards](#)" in "Installing System Board Options").
 5. Connect the tape drive's interface/DC power cable to the connector on the controller card supplied with the tape drive.
 6. Reconnect the system and peripherals to their electrical outlets, and turn them on.
 7. Perform a tape backup and verification test with the drive as instructed in the software documentation that came with the drive.
-

Configuring the Boot Device

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

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

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Getting Help

Dell™ PowerEdge™ 1650 Systems Installation and Troubleshooting Guide

- [Help Overview](#)
 - [Dell Contact Numbers](#)
-

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 system diagnostics.
3. Make a copy of the [Diagnostics Checklist](#), and fill it out.
4. Use Dell's extensive suite of online services available at the Dell | Support website (support.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 the Dell | Support website at 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

www.dell.com/

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

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

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

- 1 Anonymous file transfer protocol (FTP)

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

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

- 1 Electronic Support Service

support@us.dell.com

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 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 the Dell website at 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 system diagnostics.
4. Include any accessories that belong with the item(s) being returned (such as power cables, software floppy disks, 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
Antigua and Barbuda	General Support	1-800-805-5924
Argentina (Buenos Aires) International Access Code: 00 Country Code: 54 City Code: 11	Tech Support and Customer Care	toll free: 1-800-444-0733
	Sales	toll free: 1-800-444-3355
	Tech Support Fax	11 4515 7139
	Customer Care Fax	11 4515 7138
	Website: www.dell.com.ar	
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)	Home/Small Business Sales	01 795 67602

International Access Code: 900 Country Code: 43 City Code: 1	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: support.euro.dell.com E-mail: tech_support_central_europe@dell.com	
Barbados	General Support	1-800-534-3066
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: support.euro.dell.com E-mail: tech_be@dell.com	
	E-mail for French Speaking Customers: support.euro.dell.com/be/fr/emailldell/	
Bermuda	General Support	1-800-342-0671
Brazil International Access Code: 0021 Country Code: 55 City Code: 51	Customer Support, Technical Support	0800 90 3355
	Tech Support Fax	51 481 5470
	Customer Care Fax	51 481 5480
	Sales	0800 90 3390
	Website: 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
Cayman Islands	General Support	1-800-805-7541
Chile (Santiago) Country Code: 56 City Code: 2	Sales, Customer Support, and Technical Support	toll free: 1230-020-4823
China (Xiamen) Country Code: 86 City Code: 592	Home and Small Business Technical Support	toll free: 800 858 2437
	Corporate Accounts Technical Support	toll free: 800 858 2333
	Customer Experience	toll free: 800 858 2060
	Home and Small Business	toll free: 800 858 2222
	Preferred Accounts Division	toll free: 800 858 2062
	Large Corporate Accounts North	toll free: 800 858 2999
	Large Corporate Accounts East	toll free: 800 858 2020
	Large Corporate Accounts South	toll free: 800 858 2355
	Large Corporate Accounts GCP	toll free: 800 858 2055
	Large Corporate Accounts HK	toll free: 800 964108
	Large Corporate Accounts GCP HK	toll free: 800 907308
Colombia	General Support	980-9-15-3978
Costa Rica	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: 00 Country Code: 420	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

City Code: 2	Switchboard	02 22 83 27 11	
	Website: support.euro.dell.com		
	E-mail: czech_dell@dell.com		
Denmark (Horsholm) International Access Code: 00 Country Code: 45	Technical Support	45170182	
	Relational Customer Care	45170184	
	Home/Small Business Customer Care	32875505	
	Switchboard	45170100	
	Fax Technical Support (Upplands Vasby, Sweden)	46 0 859005594	
	Fax Switchboard	45170117	
	Website: support.euro.dell.com		
	E-mail: den_support@dell.com E-mail Support for Servers: Nordic_server_support@dell.com		
Dominican Republic	General Support	1-800-148-0530	
El Salvador	General Support	01-899-753-0777	
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: support.euro.dell.com		
	E-mail: fin_support@dell.com		
France (Paris) (Montpellier) International Access Code: 00 Country Code: 33 City Codes: (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 00	
	Sales	0825 004 700	
	Fax	0825 004 701	
	Fax (Alternative)	04 99 75 40 01	
	Website: support.euro.dell.com		
	E-mail: support.euro.dell.com/fr/fr/emaildell/		
	Corporate		
	Technical Support	0825 004 719	
	Customer Care	0825 338 339	
	Switchboard	01 55 94 71 00	
	Sales	01 55 94 71 00	
	Fax	01 55 94 71 01	
	Website: support.euro.dell.com		
	E-mail: support.euro.dell.com/fr/fr/emaildell/		
	Germany (Langen) International Access Code: 00 Country Code: 49 City Code: 6103	Technical Support	06103 766-7200
		Home/Small Business Customer Care	0180-5-224400
Global Segment Customer Care		06103 766-9570	
Preferred Accounts Customer Care		06103 766-9420	
Large Accounts Customer Care		06103 766-9560	
Public Accounts Customer Care		06103 766-9555	
Switchboard		06103 766-7000	
Website: support.euro.dell.com			
E-mail: tech_support_central_europe@dell.com			
Guatemala	General Support	1-800-999-0136	
Hong Kong International Access Code: 001 Country Code: 852	Technical Support	toll free: 800 96 4107	
	Customer Service (Penang, Malaysia)	604 633 4949	
	Transaction Sales	toll free: 800 96 4109	
	Corporate Sales	toll free: 800 96 4108	
India	Technical Support	1600 33 8045	
	Sales	1600 33 8044	
Ireland (Cherrywood) International Access Code: 16	Technical Support	1850 543 543	
	Home User Customer Care	01 204 4095	

Country Code: 353 City Code: 1	Small Business Customer Care	01 204 4026
	Corporate Customer Care	01 279 5011
	Sales	01 204 4444
	SalesFax	01 204 0144
	Fax	204 5960
	Switchboard	01 204 4444
	Website: support.euro.dell.com	
	E-mail: dell_direct_support@dell.com	
Italy (Milan) International Access Code: 00 Country Code: 39 City Code: 02	Home and Small Business	
	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Website: support.euro.dell.com	
	E-mail: support.euro.dell.com/it/it/emaildell/	
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
	Website: support.euro.dell.com	
	E-mail: support.euro.dell.com/it/it/emaildell/	
Jamaica	General Support	1-800-682-3639
Japan (Kawasaki) International Access Code: 001 Country Code: 81 City Code: 44	Technical Support (Server)	toll free: 0120-1984-35
	Technical Support Outside of Japan (Server)	81-44-556-4152
	Technical Support (Dimension™ and Inspiron™)	toll free: 0120-1982-26
	Technical Support Outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision™, OptiPlex™, and Latitude™)	toll free: 0120-1984-33
	Technical Support Outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	24-Hour Automated Order Service	044 556-3801
	Customer Care	044 556-4240
	Business Sales Division (Up to 400 employees)	044 556 3494
	Preferred Accounts Division Sales (Over 400 employees)	044 556-3433
	Large Corporate Accounts Sales (Over 3500 employees)	044 556-3440
	Public Sales (Government agencies, educational institutions, and medical institutions)	044 556 3440
	Global Segment Japan	044 556 3469
	Individual User	044 556 1657
	Faxbox Service	044 556-3490
	Switchboard	044 556-4300
Website: 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: 080-200-3600
	Customer Service (Seoul, Korea)	toll free: 080-200-3800
	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	Switchboard	2194-6000
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service)(Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600
		or 512 728-3772
Luxembourg International Access Code: 00 Country Code: 352	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: support.euro.dell.com	
	E-mail: tech_be@dell.com	
Macau	Technical Support	toll free: 0800 582
Country Code: 853	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll free: 0800 581
Malaysia (Penang)	Technical Support	toll free: 1 800 888 298
International Access Code: 00	Customer Service	04 633 4949
Country Code: 60	Transaction Sales	toll free: 1 800 888 202
City Code: 4	Corporate Sales	toll free: 1 800 888 213
Mexico	Customer Technical Support	001-877-384-8979
International Access Code: 00		or 001-877-269-3383
Country Code: 52	Sales	50-81-8800
		or 01-800-888-3355
	Customer Service	001-877-384-8979
		or 001-877-269-3383
	Main	50-81-8800
		or 01-800-888-3355
Netherlands Antilles	General Support	001-800-882-1519
Netherlands (Amsterdam)	Technical Support	020 581 8838
International Access Code: 00	Customer Care	020 581 8740
Country Code: 31	Home/Small Business Sales	toll free: 0800-0663
City Code: 20	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: 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
Nicaragua	General Support	001-800-220-1006
Norway (Lysaker)	Technical Support	671 16882
International Access Code: 00	Relational Customer Care	671 17514
Country Code: 47	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Technical Support (Upplands Vasby, Sweden)	46 0 85 590 05 594
	Fax Switchboard	671 16865
	Website: support.euro.dell.com	
	E-mail: nor_support@dell.com	
	E-mail Support for Servers: Nordic_server_support@dell.com	
Panama	General Support	001-800-507-0962
Peru	General Support	0800-50-669
Poland (Warsaw)	Customer Service Phone	57 95 700
International Access Code: 011	Customer Care	57 95 999
Country Code: 48	Sales	57 95 999
City Code: 22	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
	Website: support.euro.dell.com	
	E-mail: pl_support@dell.com	
Portugal	Technical Support	35 800 834 077

International Access Code: 00 Country Code: 35	Customer Care	800 300 415 or 35 800 834 075	
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 351 214 220 710	
	Fax	35 121 424 01 12	
	E-mail: support.euro.dell.com/es/es/emaildell/		
Puerto Rico	General Support	1-800-805-7545	
St. Lucia	General Support	1-800-882-1521	
International Access Code: 005 Country Code: 65	Singapore (Singapore)	Technical Support	toll free: 800 6011 051
	Customer Service (Penang, Malaysia)	604 633 4949	
	Transaction Sales	toll free: 800 6011 054	
	Corporate Sales	toll free: 800 6011 053	
International Access Code: 09/091 Country Code: 27 City Code: 11	South Africa (Johannesburg)	Technical Support	011 709 7710
	Customer Care	011 709 7707	
	Sales	011 709 7700	
	Fax	011 706 0495	
	Switchboard	011 709 7700	
	Website: 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	
International Access Code: 00 Country Code: 34 City Code: 91	Spain (Madrid)	Home and Small Business	
	Technical Support	902 100 130	
	Customer Care	902 118 540	
	Sales	902 118 541	
	Switchboard	902 118 541	
	Fax	902 118 539	
	Website: support.euro.dell.com E-mail: support.euro.dell.com/es/es/emaildell/		
	Corporate		
	Technical Support	902 100 130	
	Customer Care	902 118 546	
	Switchboard	91 722 92 00	
	Fax	91 722 95 83	
	Website: support.euro.dell.com E-mail: support.euro.dell.com/es/es/emaildell/		
	International Access Code: 00 Country Code: 46 City Code: 8	Sweden (Upplands Vasby)	Technical Support
Relational Customer Care		08 590 05 642	
Home/Small Business Customer Care		08 587 70 527	
Fax Technical Support		08 590 05 594	
Sales		08 590 05 185	
Website: support.euro.dell.com E-mail: swe_support@dell.com E-mail Support for Latitude and Inspiron: Swe-nbk_kats@dell.com E-mail Support for OptiPlex: Swe_kats@dell.com E-mail Support for Servers: Nordic_server_support@dell.com			
International Access Code: 00 Country Code: 41 City Code: 22		Switzerland (Geneva)	Technical Support (Home and Small Business)
	Technical Support (Corporate)	0844 822 844	
	Customer Care (Home and Small Business)	0848 802 202	
	Customer Care (Corporate)	0848 821 721	
	Fax	022 799 01 90	
	Switchboard	022 799 01 01	
	Website: support.euro.dell.com E-mail: swisstech@dell.com E-mail for French Speaking HSB and Corporate Customers: support.euro.dell.com/ch/fr/emaildell/		
	Taiwan	Technical Support	toll free: 0080 60 1255

International Access Code: 002 Country Code: 886	Technical Support (Servers)	toll free: 0080 60 1256
	Transaction Sales	toll free: 0080 651 228 or 0800 33 556
	Corporate Sales	toll free: 0080 651 227 or 0800 33 555
Thailand International Access Code: 001 Country Code: 66	Technical Support	toll free: 0880 060 07
	Customer Service (Penang, Malaysia)	604 633 4949
	Sales	toll free: 0880 060 09
Trinidad/Tobago	General Support	1-800-805-8035
U.K. (Bracknell) International Access Code: 00 Country Code: 44 City Code: 1344	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (Direct/PAD and general)	0870 908 0800
	Global Accounts Customer Care	01344 723186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	01344 72 3185
	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: support.euro.dell.com	
E-mail: dell_direct_support@dell.com		
U.S.A. (Austin, Texas) International Access Code: 011 Country Code: 1	Automated Order-Status System	toll free: 1-800-433-9014
	AutoTech (For portable and desktop computers)	toll free: 1-800-247-9362
	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 www.dell.com)	toll free: 1-877-576-3355
	Customer Service (Credit return authorization numbers)	toll free: 1-800-624-9897
	National Accounts (Computers 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 numbers)	toll free: 1-800-822-8965
	Public Americas International (Computers 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
	Desktop and Portable Fee-Based Technical Support	toll free: 1-800-433-9005
	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)
US Virgin Islands	General Support	1-877-673-3355
Venezuela	General Support	8001-3605

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