

# Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

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



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



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

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## Using Console Redirection

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

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Console redirection allows you to manage a host (local) system from a client (remote) system by redirecting keyboard input and text output through a serial port. You cannot redirect graphic output. You can use console redirection for tasks such as configuring BIOS or RAID settings.

You can also connect the client system to a port concentrator that can access numerous host systems using a shared modem. After logging into the port concentrator, you can select a host system to manage using console redirection.

This section describes the most basic connection possible: connecting systems using a null-modem serial cable, which directly connects the serial ports on two systems.

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## Hardware Requirements

- 1 An available serial (COM) port on the host system
- 1 An available serial (COM) port on a client system

This port must not conflict with any other ports on the client system.

- 1 A null-modem serial cable to connect the host system to the client system
- 

## Software Requirements

- 1 ANSI terminal emulation with a window size of 80 x 25 characters
- 1 9600, 19.2 K, 57.6 K, or 115.2 K bps using serial (COM) ports
- 1 Ability to create keyboard command macros (recommended)

All versions of the Microsoft® Windows® operating system include Hilgraeve's HyperTerminal terminal emulation software. However, the included version does not provide many functions required during console redirection. Either upgrade to HyperTerminal Private Edition 6.1 or later, or select new terminal emulation software.

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## Configuring the Host System

Configure console redirection on the host (local) system through the System Setup program (see your *User's Guide* for information on using the System Setup program). The **Console Redirection** screen allows you to enable or disable the console redirection feature, select the remote terminal type, and enable or disable console redirection after booting.

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## Configuring the Client System

After configuring the host system, configure the ports and terminal settings for the client (remote) system.



**NOTE:** The examples in this section assume that you have upgraded to Hilgraeve's HyperTerminal Private Edition 6.1 or later. If you are using other terminal emulation software, see the documentation for that software.

## Configuring the Serial Port

1. Click the **Start** button, point to **Programs**→**Accessories**→**Communications**, and then click **HyperTerminal**.
2. Enter a name for the new connection, select an icon, and then click **OK**.
3. From the **Connect to** dropdown menu, select an available COM port, and then click **OK**.

After you select an available COM port, the COM port properties window appears.

4. Configure the port with the following settings:
  - 1 Set **Bits per second**.

Console redirection supports only 9600, 19.2 K, 57.6 K, or 115.2 K bps.

- 1 Set **Data bits** to **8**.
- 1 Set **Parity** to **None**.
- 1 Set **Stop bits** to **1**.
- 1 Set **Flow control** to **Xon/Xoff**.

5. Click **OK**.

## Configuring the Terminal Settings

1. In HyperTerminal, click **File**, click **Properties**, and then click the **Settings** tab.
2. Ensure that the **Function, arrow, and Ctrl keys act as** field is set to **Terminal Keys**.
3. Ensure that the **Backspace key sends** field is set to **Ctrl+H**.
4. Change the **Emulation** setting from **Auto detect** to **ANSI**.

Ensure that this setting is the same as the setting you selected for the **Console Redirection** option on the host system.

5. Click **Terminal Setup**.

A setting for the number of rows and columns appears.

6. Change the number of rows from **24** to **25** and leave the number of columns at **80**.

If you do not have these settings, you must upgrade your terminal emulation software.

7. Click **OK** twice.

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## Managing the Host System Remotely

After you configure the host and client systems (see "[Configuring the Host System](#)" and "[Configuring the Client System](#)"), you can use console redirection to restart a host system or to change a host system's configuration settings.

1. Reboot the host system using the client system.

See "[Configuring Special Key Functions](#)" for instructions.

2. When the host system begins to boot, use console redirection to:

- 1 Enter the System Setup program
- 1 Enter the SCSI setup menus
- 1 Update firmware and BIOS (flash the system)

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## Configuring Special Key Functions

Console redirection uses ANSI terminal emulation, which is limited to basic ASCII characters. Function keys, arrow keys, and control keys are not available in the ASCII character set, and most utilities require function keys and control keys for ordinary operations. However, you can emulate a function key or control key using a special key sequence, called an escape sequence.

An escape sequence starts with an escape character. You can enter this character in different ways, depending on the requirements of your terminal emulation software. For example, 0x1b and <Esc> each represent the escape character. In HyperTerminal, you can create macros by selecting **Key Macros** from the **View** menu. You can assign a macro to almost any key for almost any key combination. Create a macro to represent each function key.

[Table A-1](#) lists the escape sequences that represent a special key or function.

 **NOTE:** When creating macros in HyperTerminal, press <Insert> before <Esc> to signify that you are sending an escape sequence rather than escaping out of the dialog box. If you do not have this function, you must upgrade HyperTerminal.

 **NOTE:** Escape-sequence key combinations listed in [Table A-1](#) are case-sensitive. For example, to generate the character <A> you must press <Shift><a>.

**Table A-1. Supported ANSI Escape Sequences**

Key(s)	Supported Sequence	Additional Escape Sequence
<Up arrow>	<Esc>[<Shift>a	<Esc>w
<Down arrow>	<Esc>[<Shift>b	<Esc>x
<Right arrow>	<Esc>[<Shift>c	<Esc>d
<Left arrow>	<Esc>[<Shift>d	<Esc>a
<F1>	<Esc><Shift>op	<Esc>1
<F2>	<Esc><Shift>oq	<Esc>2

<F3>	<Esc><Shift>or	<Esc>3
<F4>	<Esc><Shift>os	<Esc>4
<F5>	<Esc><Shift>ot	<Esc>5
<F6>	<Esc><Shift>ou	<Esc>6
<F7>	<Esc><Shift>ov	<Esc>7
<F8>	<Esc><Shift>ow	<Esc>8
<F9>	<Esc><Shift>ox	<Esc>9
<F10>	<Esc><Shift>oy	<Esc>0
<F11>	<Esc><Shift>oz	<Esc>!
<F12>	<Esc><Shift>oa	<Esc>@
<Home>	<Esc>[<Shift>h	<Esc>h
<End>	<Esc>[<Shift>k	<Esc>k
<Insert>	<Esc>[2	<Esc>+
<Delete>	<Esc>[3	<Esc>-
<Page Up>	<Esc>[5	<Esc>?
<Page Down>	<Esc>[6	<Esc>/
<Ctrl><Alt><Del>	<Esc><Shift>b	<Esc>R<Esc>r<Esc>R
Enter BIOS Setup		<Esc><Shift>s

After creating macros for the keys listed in [Table A.1](#), press <F1> on the client system's keyboard during terminal emulation to send the escape sequence <Esc><O><P> to the host system. The host system then interprets the sequence as <F1>.

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## I/O Connectors

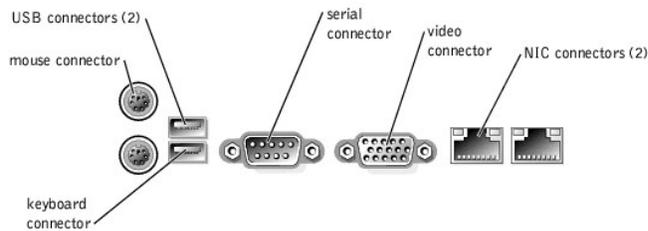
### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [I/O Connectors](#)
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- [PS/2-Compatible Keyboard and Mouse Connectors](#)
- [Video Connector](#)
- [USB Connector](#)
- [Integrated NIC Connector](#)
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## I/O Connectors

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

Figure B-1. I/O Connectors



[Table B-1](#) shows the icons used to label the connectors on the system.

Table B-1. I/O Connector Icons

Icon	Connector
	Serial connector
	Mouse connector
	Keyboard connector
	Video connector
	USB connector
	NIC connector

## Serial Connector

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

## Serial Connector Autoconfiguration

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

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

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

[Figure B-2](#) illustrates the pin numbers for the serial connector and [Table B-2](#) defines the pin assignments for the connector.

Figure B-2. Serial Connector Pin Numbers

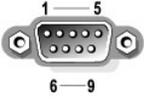


Table B-2. Serial Connector Pin Assignments

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

## PS/2-Compatible Keyboard and Mouse Connectors

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

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



Table B-3. Keyboard and Mouse Connector Pin Assignments

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

## Video Connector

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

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

Figure B-4. Video Connector Pin Numbers

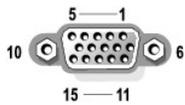


Table B-4. Video Connector Pin Assignments

Pin	Signal	I/O	Definition
1	RED	O	Red video

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

## USB Connector

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

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

Figure B-5. USB Connector Pin Numbers



Table B-5. USB Connector Pin Assignments

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

## Integrated NIC Connector

The system's integrated NICs function as a separate network expansion cards while providing fast communication between servers and workstations. [Figure B-6](#) illustrates the pin numbers for the NIC connector and [Table B-6](#) defines the pin assignments for the connector.

Figure B-6. NIC Connector

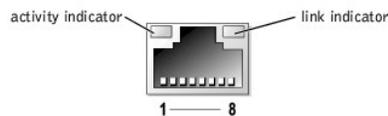


Table B-6. Pin Assignments for 1000 Mb Gigabit Ethernet NIC

Pin	Signal
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_Dblink
7	BI_DD+
8	BI_DDTabl

## Network Cable Requirements

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

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

- 1 Use Category 5 or greater wiring and connectors.
- 1 Do not exceed a cable run length (from a workstation to a hub) of 100 m (328 ft).

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

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## Abbreviations and Acronyms

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

#### A

ampere(s)

#### AC

alternating current

#### ANSI

American National Standards Institute

#### APM

advanced power management

#### BIOS

basic input/output system

#### C

Celsius

#### CD

compact disc

#### cm

centimeter(s)

#### CMOS

complementary metal-oxide semiconductor

#### CPU

central processing unit

#### DC

direct current

#### DHCP

Dynamic Host Configuration Protocol

#### DIMM

dual in-line memory module

#### DMA

direct memory access

#### DMI

desktop management interface

#### dpi

dots per inch

#### DRAM

dynamic random-access memory

#### ECC

error checking and correction

#### EDO

extended-data out

## **EGA**

enhanced graphics adapter

## **EIDE**

enhanced integrated drive electronics

## **EMI**

electromagnetic interference

## **EMM**

expanded memory manager

## **EMS**

Expanded Memory Specification

## **EPP**

Enhanced Parallel Port

## **EPROM**

erasable programmable read-only memory

## **ESD**

electrostatic discharge

## **ESDI**

enhanced small-device interface

## **ESM**

embedded server management

## **F**

Fahrenheit

## **FAT**

file allocation table

## **FCC**

Federal Communications Commission

## **ft**

feet

## **g**

gram(s)

## **GB**

gigabyte(s)

## **GUI**

graphical user interface

## **Hz**

hertz

## **I/O**

input/output

## **ID**

identification

**IDE**

integrated drive electronics

**IPX**

Internet packet exchange

**IRQ**

interrupt request

**ISA**

Industry-Standard Architecture

**KB**

kilobyte(s)

**KB/sec**

kilobyte(s) per second

**kg**

kilogram(s)

**kHz**

kilohertz

**L2**

Level 2

**LAN**

local area network

**lb**

pound(s)

**LED**

light-emitting diode

**LVD**

low voltage differential

**m**

meter(s)

**mA**

milliamper(s)

**mAh**

milliamper-hour(s)

**MB**

megabyte(s)

**MHz**

megahertz

**mm**

millimeter(s)

**ms**

millisecond(s)

**MS-DOS®**

Microsoft® Disk Operating System

**mV**

millivolt(s)

**NAS**

network attached storage

**NIC**

network interface controller

**NIS**

network information service

**NiCad**

nickel cadmium

**NMI**

nonmaskable interrupt

**ns**

nanosecond(s)

**NTFS**

NT File System

**NVRAM**

nonvolatile random-access memory

**PCI**

Peripheral Component Interconnect

**PDU**

power distribution unit

**PGA**

pin grid array

**POST**

power-on self-test

**RAID**

redundant array of independent disks

**RAM**

random-access memory

**RAS**

remote access services

**RGB**

red/green/blue

**ROM**

read-only memory

**rpm**

revolutions per minute

**RTC**

real-time clock

**SCA**

Single Controller Architecture

**sec**

second(s)

**SDRAM**

synchronous dynamic random-access memory

**SIMM**

single in-line memory module

**SMBus**

system management bus

**SNMP**

Simple Network Management Protocol

**SDRAM**

synchronous dynamic random-access memory

**TCP/IP**

Transmission Control Protocol/Internet Protocol

**UART**

universal asynchronous receiver-transmitter

**UPS**

uninterruptible power supply

**UTP**

unshielded twisted pair

**V**

volt(s)

**VAC**

volt(s) alternating current

**VDC**

volt(s) direct current

**VGA**

video graphics array

**VRAM**

video random-access memory

**W**

watt(s)

**WH**

watt-hour(s)

**ZIF**

zero insertion force

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## Introduction

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [Other Documents You May Need](#)
- [Getting Help](#)

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The Dell™ PowerVault™ 725N network attached storage (NAS) system allows you to easily add storage to a workgroup, small office, or small business network, offloading the file management responsibilities from the server. The NAS system is a "headless" device, meaning it can be managed from any browser. Or you can connect a keyboard, mouse, and monitor to configure or troubleshoot the system.

The system includes the following service features to make troubleshooting and repair easy and effective:

- 1 PowerVault NAS Manager, which is a Web-based software interface used to monitor and manage the system
- 1 A temperature monitor that shuts down the system if the temperature exceeds the threshold setting
- 1 System diagnostics, which checks for hardware problems
- 1 A chassis and system board that simplifies removing and replacing components
- 1 Microsoft® Windows® Powered operating system help (available through Windows Terminal Services)

The following system upgrade options are available:

- 1 Processor
- 1 Memory
- 1 PCI expansion card

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## Other Documents You May Need



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

- 1 The *Rack Installation Guide* included with your rack solution describes how to install your system into a rack.
- 1 The *Setting Up Your System* document provides an overview of initially setting up your system.
- 1 The *User's Guide* provides information about system features and technical specifications.
- 1 The *System Administrator's Guide* provides system configuration, operation, and management information.
- 1 Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- 1 Operating system documentation describes how to install (if necessary), configure, and use the operating system software.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.



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

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

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## Getting Help

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

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## Indicators, Messages, and Codes

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [Front-Panel Indicators](#)
- [Back-Panel Indicators](#)
- [System Messages](#)
- [System Beep Codes](#)
- [NAS Manager Messages](#)

This section describes how the NAS system alerts you to system problems, and lists possible causes and actions you can take to resolve these problems.

The following are ways the NAS system can alert you to a problem or potential problem:

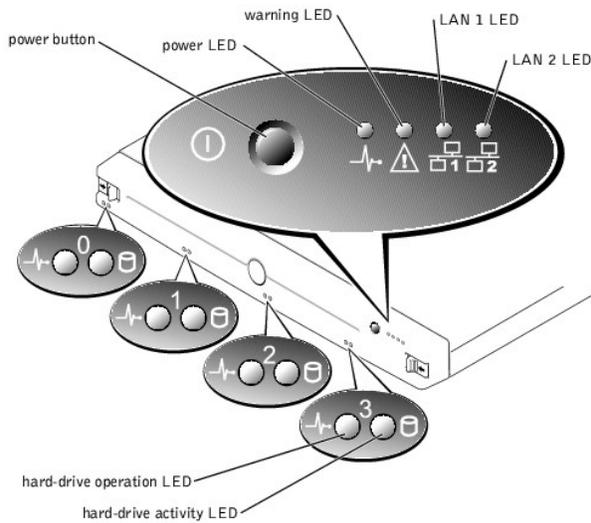
- 1 LED indicators for the system and the hard drives
- 1 System messages
- 1 System beep codes
- 1 NAS Manager messages
- 1 Diagnostics messages

The following sections provide more information about LED indicators, system messages and beep codes, and NAS Manager messages. For information on diagnostics messages, see "[Running System Diagnostics](#)."

## Front-Panel Indicators

Two types of LED indicators are available on the system's front panel. See [Figure 2-1](#). The indicators along the bottom of the front panel indicate hard-drive status, and the indicators near the power button indicate system status. [Table 2-1](#) details the conditions associated with each front-panel LED indicator code.

**Figure 2-1. Front Panel Indicators**



**Table 2-1. Front Panel LED Codes**

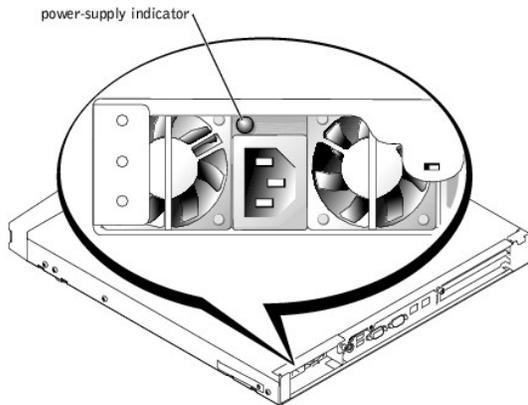
LED Indicator	Normal Operation	Error Condition
Power	Green	Not applicable.
Warning	Off	Any flash pattern or color indicates a system error. See " <a href="#">System Messages</a> ."
LAN 1 and LAN 2	Steady green indicates the system is connected to the network through the LAN 1 or LAN 2 connector.  Flashing green indicates activity between the system and other devices on the network.	Off indicates the system is disconnected from the network or the LAN 1 or LAN 2 connector is not working properly.
Hard drive	Green indicates the hard drive is installed	Amber indicates a hard drive error. While a hard drive may be inserted in the drive bay, there

operation	in the drive bay and working.	may be a problem with either the drive or a volume on the drive. The amber/green flash pattern indicates that the RAID for this hard drive is being rebuilt.
Hard drive activity	Flashing amber indicates the hard drive is active.	Not applicable.

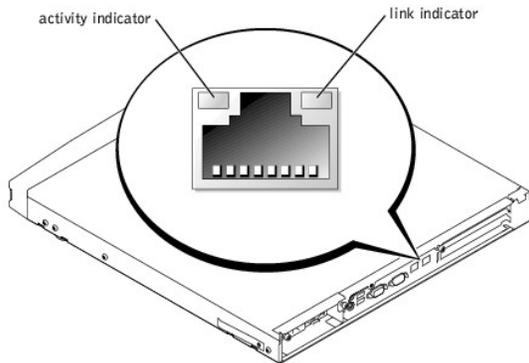
## Back-Panel Indicators

Indicators are on the system's back panel for the power supply (see [Figure 2-2](#)) and the integrated NICs (see [Figure 2-3](#)). [Table 2-2](#) details the conditions associated with each back-panel LED indicator code.

**Figure 2-2. Power-Supply Indicator**



**Figure 2-3. NIC Indicators**



**Table 2-2. Back Panel LED Codes**

LED Indicator	Normal Operation	Error Condition
Power supply	<ul style="list-style-type: none"> <li>1 Steady green indicates that the system is receiving power from a power source and the system is turned on.</li> <li>1 Blinking green indicates that the system is receiving power, but the system is not turned on.</li> </ul>	<ul style="list-style-type: none"> <li>1 Steady amber indicates the power supply has either shut down because temperatures or voltages are outside threshold limits, or the power supply has failed.</li> <li>1 Off indicates that the system is not receiving power from a power source or the power supply has failed.</li> </ul>
NIC activity	Flashing green indicates network data is being sent or received.	When the NIC indicator is off at the same time the link indicator is off, the NIC is not connected to the network.
NIC link	Steady amber indicates that the NIC is connected to a valid link partner on the network.	When the NIC indicator is off at the same time the activity indicator is off, the NIC is not connected to the network.

## System Messages

System messages alert you to a possible hardware problem during system boot.

To view system messages, perform the following steps:

1. Connect a keyboard, mouse, and monitor to the NAS system and enter the System Setup utility by pressing <F2> during system boot.

See your User's Guide for information about using the System Setup utility.

 **NOTE:** While it is recommended that you use a keyboard, mouse, and monitor to access the System Setup utility, you can also use console redirection from a client system connected by serial cable to the NAS system. For more information about using console redirection, see ["Using Console Redirection."](#)

2. From the **Advanced** menu, select **Event Log Configuration**.
3. Select View Event Log and press <Enter>.

 **NOTE:** If the **View Event Log** option is not present, then event logs are not available.

[Table 2-3](#) lists the system error messages and the probable cause for each message.

**Table 2-3. System Messages**

Message	Cause	Corrective Action
HDD Controller Failure	BIOS cannot communicate with the hard drive controller.	Check the connections to the hard drive.
CMOS Battery Low	The battery on the system is low or faulty.	Replace the system battery. See <a href="#">"Replacing the System Battery"</a> in "Installing System Board Options." If the problem persists, replace the system board. See <a href="#">"Getting Help."</a>
CMOS Checksum Bad	The checksum value (CMOS RAM settings) differs from the current value.	In the System Setup utility, select to autoload the optimal setting. See "Using the System Setup Utility" in your <i>User's Guide</i> for information about changing this setting.
CMOS Time and Date Not Set	The BIOS does not have date and time values.	Use the System Setup utility to set the time and date. See "Using the System Setup Utility" in your <i>User's Guide</i> for information about changing this setting.
Pri Master HDD error	Primary hard drive is not responding.	Replace the primary hard drive. See <a href="#">"Removing and Installing a Hard Drive."</a> If the problem still persists, see <a href="#">"Getting Help."</a>
Sec Master HDD error	Secondary hard drive is not responding.	Replace the secondary drive. See <a href="#">"Removing and Installing a Hard Drive."</a> If the problem still persists, see <a href="#">"Getting Help."</a>
Cache Memory Error	Cache memory is defective.	Disable the cache in the System Setup utility. See "Using the System Setup Utility" in your <i>User's Guide</i> for information about changing this setting.

## System Beep Codes

When an error occurs during a boot routine that cannot be reported on the screen (either on a monitor connected directly to the NAS system or on a client screen using console redirection), the system may emit a series of beeps to indicate a problem. For example, five beeps indicates a problem with the processor. This information is valuable to technical support representatives if you must call for technical assistance.

When you hear a beep code, record it, and then look up a description of the problem and corrective action in [Table 2-4](#). If you are unable to resolve the problem using the beep code, use the system diagnostics to identify the cause. If you are still unable to resolve the problem, see ["Getting Help."](#)

**Table 2-4. System Beep Codes**

Beeps	Cause	Corrective Action
1	The memory refresh circuitry on the system board is faulty.	Replace the system board. See <a href="#">"Getting Help."</a>
2	Parity error in the first 64 KB of memory.	Switch memory modules. See <a href="#">"Adding System Memory"</a> in <a href="#">"Installing and Replacing System Components"</a> for information about replacing memory modules.
3	Memory failure in the first 64 KB of memory.	Switch memory modules. See <a href="#">"Adding System Memory"</a> in <a href="#">"Installing and Replacing System Components"</a> for information about replacing memory modules.
4	Memory failure in the first 64 KB of memory, or Timer 1 on the system board is not functioning.	Switch memory modules. See <a href="#">"Adding System Memory"</a> in <a href="#">"Installing and Replacing System Components"</a> for information about replacing memory modules.
5	The processor on the system board has generated an error.	Remove and reseat the processor. See <a href="#">"Upgrading the Processor"</a> in <a href="#">"Installing and Replacing System Components."</a> If the problem persists, replace the processor. If the problem still persists, see <a href="#">"Getting Help."</a>
6	The keyboard controller has generated an error.	The BIOS cannot switch to protected mode. See <a href="#">"Troubleshooting the System Board"</a> in <a href="#">"Troubleshooting Your System."</a>
7	Processor exception interrupt error. The processor generated an exception interrupt.	Remove and reseat the processor. See <a href="#">"Upgrading the Processor"</a> in <a href="#">"Installing and Replacing System Components."</a> If the problem persists, replace the processor. If the problem still persists, see <a href="#">"Getting Help."</a>
8	Display memory read/write error.	The system video adapter is either missing or its memory is faulty. See <a href="#">"Getting Help."</a>
9	ROM checksum error.	The ROM checksum value does not match the value encoded in the BIOS. Call technical support. See <a href="#">"Getting Help."</a>
10	CMOS shutdown register read/writer error.	See <a href="#">"Getting Help."</a>
11	External cache is faulty.	Remove and reseat the processor. See <a href="#">"Upgrading the Processor"</a> in <a href="#">"Installing and Replacing System Components."</a> If the problem persists, replace the processor. If the problem still persists, see <a href="#">"Getting Help."</a>

## NAS Manager Messages

The NAS manager maintains a log file that stores messages, which are sometimes called events or event log entries, generated by an application, service, or operating system. The messages are used to track the operations performed by the system. For information about viewing log files, see your *System Administrator's Guide*.

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## Running System Diagnostics

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [Running the System Diagnostics Program](#)
- [Running the Dell OpenManage Hard-Drive Diagnostics Program](#)
- [Running the NIC Diagnostics Program](#)

Several tools are available to help diagnose problems when your NAS system or one of its components is not operating properly. The system diagnostics program allows you to run tests on the entire system or on specific system components such as memory, hard drives, video, and USB. Additionally, separate programs are available to help you diagnose problems with hard drives and NICs. [Table 3-1](#) describes diagnostics programs available for your NAS system and its components.

**Table 3-1. NAS System Diagnostics Programs**

Component	Diagnostics Program
System	System diagnostics program. See " <a href="#">Running the System Diagnostics Program</a> ."
Memory	System diagnostics program. See " <a href="#">Running the System Diagnostics Program</a> ."
Hard drives	Dell OpenManage™ Hard-Drive Diagnostics program. See "Running Dell OpenManage Hard-Drive Diagnostics." System diagnostics program. See " <a href="#">Running the System Diagnostics Program</a> ."
Video	System diagnostics program. See " <a href="#">Running the System Diagnostics Program</a> ."
USB	System diagnostics program. See " <a href="#">Running the System Diagnostics Program</a> ."
NIC	NIC diagnostics program. See " <a href="#">Running the NIC Diagnostics Program</a> ."

## Running the System Diagnostics Program

The system's BIOS ROM contains diagnostic software that can be launched during system boot that allows you to test hardware components to identify problems.

The following categories of tests are available from the diagnostics main menu:

- 1 System (see "[System Tests](#)")
- 1 Memory (see "[Memory Tests](#)")
- 1 Hard drives (see "[IDE Tests](#)")
- 1 Video (see "[Video Tests](#)")
- 1 USB (see "[USB Test](#)")

You can set test parameters and run tests on individual components by selecting the component from the main menu, or you can use the **Options** menu to run tests on multiple components. See "[Using the System Diagnostics Program Options Menu to Run Tests and Generate Test Reports](#)."

## Using the System Diagnostics Program

To enter the System Diagnostics program, perform the following steps:

1. Turn off the NAS system.
2. Connect a keyboard, mouse and monitor to the NAS system.

 **NOTE:** While it is recommended that you use a keyboard, mouse, and monitor to access system diagnostics, you can also use console redirection from a client system connected by serial cable to the NAS system. For more information about using console redirection, see "[Using Console Redirection](#)."

3. Restart the NAS system.
4. Press <F2> immediately after you see the following message:

```
Press <F2> to Enter the Function Select Menu
```

If you wait too long and the operating system begins to boot, allow the system to complete the boot, and then shut down the system and try again.

5. When the **Function Select** menu appears, press <5> to run the system diagnostics program.
6. Press <Y> to confirm that you want to run diagnostics.

 **NOTE:** The system diagnostics program does not start until the POST is complete.

## Navigating the System Diagnostics Program

[Table 3-2](#) lists the basic keys used to view or change information in the system diagnostics program and to exit the program. [Table 3-3](#) lists the function keys

that provide a short-cut to specific system diagnostics program functions.

**Table 3-2. System Diagnostics Program Navigation Keys**

Keys	Function
<Shift>, <Tab>, or down arrow	Moves to the next field.
Up arrow	Moves to the previous field.
Right arrow	Moves to the next menu.
Left arrow	Moves to the previous menu.
Space bar	Selects or deselects options on menus. Selected options are identified by a check mark.
<Enter>	Starts a test on an individual component or displays submenus.
<Esc>	<p>Cancels the current operation or returns to the previous menu. On the main menu, &lt;Esc&gt; exits the system diagnostics program and reboots the system.</p> <p>For most of the options, any changes you make are recorded but do not take effect until you reboot the system. For a few options (as noted in the help area at the bottom of the screen), the changes take effect immediately.</p>

**Table 3-3. System Diagnostics Program Function Keys**

Key	Function
<F2>	Edit batch parameters.
<F3>	Load batch parameters.
<F4>	Save batch parameters.
<F5>	Select/deselect current test.
<F6>	Select/deselect <b>All Tests in Menu</b> .
<F7>	Select/deselect <b>All Tests</b> .
<F8>	Select/deselect <b>All Quick Tests</b> .
<F9>	List function keys.
<F10>	Run the selected test.

## Types of System Diagnostics Program Tests

### System Tests

System tests help identify problems with system-board components such as processors, controllers, buses, and so on.

Select **System** from the system diagnostics program main menu to access the following tests:

- 1 **Processor Tests** – Tests processor functionality. The system diagnostics program provides four processor tests:
  - o **Basic Functionality Test** – Verifies that the processor operates correctly and efficiently in all addressing modes. The test is performed in 16-bit real mode.
  - o **Processor Speed Test** – Determines and displays the processor clock speed. The screen displays the expected processor speed and the actual processor clock speed. processor speed is determined by measuring the number of processor clock cycles that occur in a known time period.
  - o **CPU Protected Mode Test** – Verifies the protected-mode instructions used by the operating system for switching to protected mode.
  - o **Coprocessor Test** – Checks the functionality of the math coprocessor. This test loads and stores the control and status word, checks data transfer between the processor and the math coprocessor, and tests exception checking while the data transfer is in progress.
- 1 **DMA Controller Test** – Performs a series of read and write tests on the memory address registers and page registers of the DMA controllers.
- 1 **Interrupt Controller Test** – Performs a series of read and write tests on interrupt mask registers and checks for stray interrupts after masking off all interrupts.
- 1 **Timer Test** – Checks the accuracy of the timer count by calibrating it against the periodic interrupt of the Real Time Clock (RTC).
- 1 **Real Time Clock Test** – Checks the regularity of the real time clock interrupt by calibrating it against the timer 0 interrupt.
- 1 **CMOS Validity Test** – Checks the validity of the data in CMOS RAM and makes sure that the CMOS RAM checksums are correct. This test also ensures that the battery is in good condition.
- 1 **Speaker Test** – Performs test on system speaker and allows you to adjust the volume.
- 1 **PCI System Test** – Scans the PCI bus for all PCI devices and checks their configurations.
- 1 **SMBus Test** – Checks that the System Management Bus (SMBus) works properly. This test consists of the SMBus general test and the SMB access test.
- 1 **Hardware Monitor Tests** – Reads the values for temperature, fan speed, and voltage to verify that they are within a specified range using the following tests:
  - o **Temperature and Fan Speed Test**
  - o **Voltage Test**

### Memory Tests

Memory tests, which report the size of system memory, write to all areas of installed DDR system memory up to 3 GB. The system diagnostics program isolates faulty memory modules and displays a message that identifies the location of the faulty memory.

Select **Memory** from the system diagnostics program main menu to access the following tests:

- 1 **BIOS ROM Test** – Checks the data path of the BIOS ROM and makes sure the ROM is write-protected.
- 1 **Parity Test** – Finds parity errors in all system memory. This test is the best way to identify and report data corruption because of DRAM system memory hardware problems. This test diagnoses the parity error detection circuitry in DRAM.
- 1 **Pattern Test** – Includes test routines that write a series of test patterns to memory, then read the patterns back and compare the read results with the pattern that was written. The memory read and write instructions test all of DRAM.
- 1 **Extended Pattern Test** – Includes test routines that write data to memory, read the data back, and compare the data.
- 1 **Walking 1's Test** – Uses the Walking 1's Left Test and the Walking 1's Right Test routines to identify shorts on data lines and data bits that are hung at 1.
- 1 **Walking 0's Test** – Writes shifting patterns to memory to find memory errors. This test uses the Walking 0's Left Test and the Walking 0's Right Test to identify open data lines.
- 1 **Random Memory Test** – Writes a random bit pattern to a randomly selected DRAM system memory location and reads the same memory location, looking for the same bit pattern that was written.
- 1 **Address Test** – Checks for short and open circuits on address lines.
- 1 **Refresh Test** – Checks the DRAM system memory refresh interval rate and compares with the ISA standard.
- 1 **Data Bus Test** – Ensures that the data bus works properly by testing individual lines of the data bus.
- 1 **Cache Memory Test** – Identifies and tests the external cache memory, and then performs a random pattern test within the range of the cache memory size to detect cache memory problems.
- 1 **Quick Memory Test** – Quickly verifies that the entire installed memory can be accessed.

## IDE Tests

When you are unable to access the operating system, the system diagnostics program's IDE tests can be used to perform read tests on the hard drives to determine if they are functioning properly.

-  **NOTE:** If you are able to access your operating system, it is recommended that you use the Dell OpenManage Hard-Drive Diagnostics program to test your hard drives online. See "[Running the Dell OpenManage Hard-Drive Diagnostics Program](#)."
-  **NOTE:** With the exception of the IDE HDD Quick Test, the following IDE tests can take up to a day to complete. It is recommended that you first run the quick test to see if the problem can be quickly identified before running more comprehensive tests.

Select **IDE** from the system diagnostics program main menu to access the following tests:

- 1 **IDE HDD Read Test** – Performs sequential and random read operations on the specified part of the IDE drive.
- 1 **IDE HDD Verify Test** – Performs sequential and random read and verify operations on the specified part of the IDE drive.
- 1 **IDE HDD Seek Test** – Determines the head movement ability of the hard drive over the specified cylinder and head range. It consists of a sequential seek test and random seek test.
- 1 **IDE HDD Quick Test** – Verifies that the software can fully access the selected IDE hard drive. The test reads small blocks of sectors at the beginning, middle, and end of the hard drive.

## Video Tests

**Video** tests perform read, write, and compare tests on the video memory to determine if the video controller and the monitor are functioning properly.

Select **Video** from the diagnostics main menu to access the following tests:

- 1 **Video Controller Tests**
  - o **VGA Controller Test** – Tests the VGA controller.
  - o **Video Memory Test** – Performs read, write, compare tests on the video controller.
  - o **VESA Video Memory Test** – Checks the VESA® video memory.
- 1 **Video Monitor Tests**
  - o **Attribute Test** – Checks the attributes of the display adapter.
  - o **Page Selection Test** – Checks display pages.
  - o **Color Test** – Checks foreground, background, and border colors.
  - o **Text Mode Test** – Checks the text mode character sets of the display adapter.
  - o **Graphics Mode Test** – Checks the graphics mode of the display adapter.
  - o **VESA Video Modes Test** – Tests the supported VESA video modes.

## USB Test

The USB test verifies functionality of the USB. Select **USB** from the system diagnostics program main menu to access the test.

## Using the System Diagnostics Program Options Menu to Run Tests and Generate Test Reports

The system diagnostics program allows you to run tests on multiple components using the **Options** menu. The **Options** menu also allows you to set test

parameters for batch tests, configure specific batch tests for user interaction, run quick tests and test reports. See "[Logging System Diagnostics Program Test Results](#)" for instructions about running reports. Select **Options** from the system diagnostics program main menu to perform the following tasks:

- 1 **Download Report** – Downloads a report to the console using XMODEM protocol.
- 1 **Edit Batch Parameters** – Edits parameters for batch tests.
- 1 **Load Batch Parameters** – Loads batch parameters from the console using XMODEM protocol.
- 1 **Save Batch Parameters** – Saves batch parameters.
- 1 **Generate Report** – Generates test reports.
- 1 **Clear Report** – Clears the test report log.
- 1 **Display Error Log File** – Allows you to view the test report log online.
- 1 **Toggle All Tests in Menu** – Selects or deselects all of the tests on a selected menu. For instance, you could toggle all the tests under the **Memory** menu.
- 1 **Toggle All Tests** – Selects or deselects all of the tests in the system diagnostics program.
- 1 **Toggle All Quick Tests** – Selects or deselects tests that are classified as Quick Tests.
- 1 **Run Selected Tests** – Runs all tests that have been selected on a particular menu. Selected tests have a check mark to the left of them.
- 1 **Toggle Hidden Test Display** – Displays or hides tests that are hidden by default, making them available for selection on the menu.

## Logging System Diagnostics Program Test Results

Use the **Options** menu to select how you want to report system diagnostics program test results. You can log test results ranging from detailed (such as all test names, time started, time ended, and error) to basic results that show only the error.

The error log identifies errors by an error code. See the **errorcodes.txt** file on your *Resource* CD for information about the codes. You can generate a report and view it online, or download it to a client system using a HyperTerminal connection.

### Generating a Report

1. Run the system diagnostics program tests.
2. Select the **Options** menu, select **Generate Report**, and press <Enter>.
3. Select **Continue** and press <Enter>.

### Viewing a Report

To view the test report, select the **Options** menu, select **Display Error Log File**, and press <Enter>.

### Downloading a Report

1. Setup a HyperTerminal connection between a client and the NAS system. See "[Using Console Redirection](#)."
2. From a HyperTerminal session, run system diagnostics program tests. See "[Running the System Diagnostics Program](#)."
3. After running the diagnostics test, select **Options**, select **Download Reports**, and press <Enter>.
4. From the HyperTerminal window, select **Transfer**, and then select **Receive file**.
5. Enter the location where you want to save the report, select **XModem** as the protocol, and then click **Receive**.
6. Enter the filename of the report using the extension of your text editor (for example, test1.txt), and click **OK**.
7. Open the text file to view the report.

### Clearing the Test Log

The system diagnostics program report includes information for the entire test log, which contains all tests that you have run. To clear the test log, select the **Options** menu, select **Clear Report**, and press <Enter>. The test log clears, and the next test report shows only results from tests run since you cleared the log.

---

## Running the Dell OpenManage Hard-Drive Diagnostics Program

The Dell OpenManage Hard Drive Diagnostics program enables you to test storage components online and verify if a hard drive is functional.

While it is possible to use the IDE test function of the system diagnostics program to diagnose your hard drives, if you are able to access your operating system, it is recommended that you use the Dell OpenManage Hard-Drive Diagnostics program instead. If you are unable to access your operating system, use the system diagnostics program to test hard drives. See "[Running the System Diagnostics Program](#)."

The Dell OpenManage Hard-Drive Diagnostics program allows you to test drives attached to your NAS system through either a Dell-qualified SCSI adapter, IDE adapter, or SCSI or IDE PCI RAID controller and determine the status of the attached disks.

The Dell OpenManage Hard-Drive Diagnostics program can be accessed from the desktop of the NAS system. For information about using the program, see the online help.

---

## Running the NIC Diagnostics Program

 **NOTE:** Using Terminal Services to run the NIC diagnostics program may cause your Terminal Services session to disconnect. In the event you lose the connection, wait a few minutes and then log in again. The test results will be displayed after logging in. Also, you may perform the NIC diagnostics tests using a keyboard, monitor, and mouse attached directly to the NAS system.

To run the NIC diagnostics program:

1. Log into the NAS Manager.
2. Click **Maintenance**.
3. Click **Terminal Services**, and then log into the NAS system as an administrator.

 **NOTE:** The default administrator user name is `administrator` and the default password is `powervault`.

4. Click **Administrative Tools** on the **Advanced Administration** menu.
5. Click **Broadcom Network Teaming**.

This launches the Broadcom Advanced Control Suite.

6. Click the **Diagnostics** tab.
7. In the left window, click the adapter (NIC) you want to test.
8. In the right window, select the tests you want to run OR click **Select All** to select all tests.
9. Click **Test** to run selected tests.

For more information, see the online help for your NIC.

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## Troubleshooting Your System

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [Safety First—For You and Your System](#)
- [External Connections](#)
- [Checking Specific System Problems](#)
- [Startup Routine](#)
- [Removing and Replacing the Front Panel](#)
- [Removing and Replacing the System Cover](#)
- [Checking the Equipment](#)
- [Troubleshooting Hard Drives](#)
- [Inside the System](#)
- [Troubleshooting a Wet System](#)
- [Troubleshooting a Damaged System](#)
- [Troubleshooting the System Battery](#)
- [Troubleshooting the Power Supply](#)
- [Troubleshooting the Cooling Fans](#)
- [Troubleshooting an Expansion Card](#)
- [Troubleshooting System Memory](#)
- [Troubleshooting the System Board](#)
- [Recovering the System](#)
- [Changing or Clearing the Supervisor Password](#)
- [Disabling a Forgotten Password](#)

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

 **CAUTION:** Read the "Safety Instructions" in your *System Information Guide*.

Read "[Running System Diagnostics](#)" for information about running diagnostics.

 **NOTE:** While it is recommended that you use a keyboard, mouse, and monitor to troubleshoot the system, you can also use console redirection from a client system connected by serial cable to the NAS system. For more information, see "[Using Console Redirection](#)."

## Safety First—For You and Your System

The procedures in this document require that you remove the system cover and work inside the system. While working inside the system, do not attempt to service the system except as explained in this guide and elsewhere in your system documentation. Always follow the instructions closely. Ensure that you review all of the procedures in "Safety Instructions" in your *System Information Guide*.

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

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

## External Connections

Improperly set switches, controls, and loose or improperly connected cables are the most likely source of problems with the system and attached peripherals. A quick check of all the switches, controls, and cable connections can easily solve many of these problems. See your User's Guide for the location of back-panel features and connectors. See "[I/O Connectors](#)" for more information about the functionality of each connector type.

## Checking Specific System Problems

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

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

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

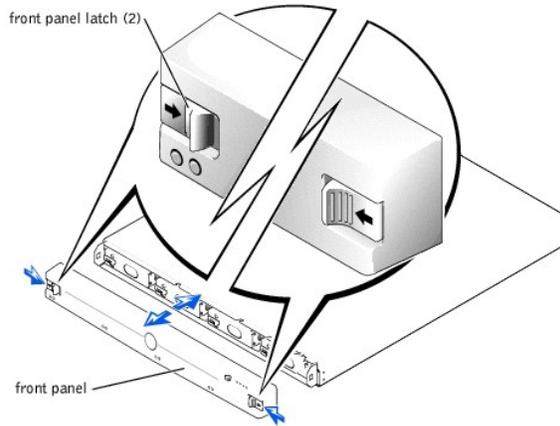
## Startup Routine

It is important to look and listen to your system when trying to determine the source of a problem. If during system startup you hear beeps, see error messages, or see LED indicators flashing, there may be a problem with the system or one of its components. For more information, see "[Indicators, Messages, and Codes](#)."

## Removing and Replacing the Front Panel

To access the hard drives, you must first remove the system's front panel. To remove the front panel, push the front panel latches inward and pull the panel away from the system. See [Figure 4-1](#).

Figure 4-1. Removing the Front Panel



To replace the front panel, push the latches inward, place the panel on the front of the system and release the latches.

---

## Removing and Replacing the System Cover

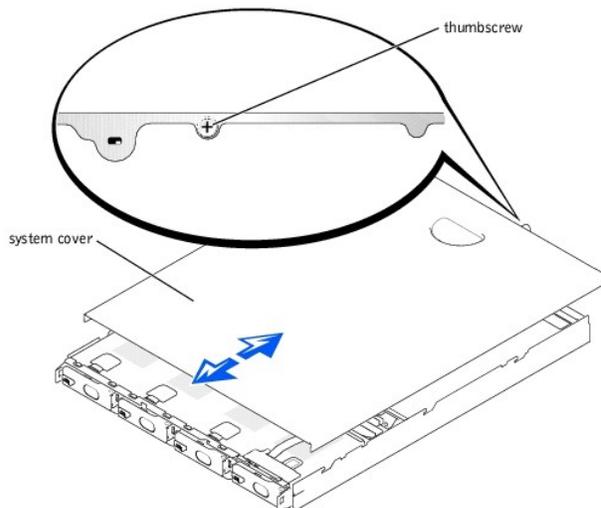
To add or replace internal system components or troubleshoot the system, you must first remove the system cover to access components.

### Removing the System Cover

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

1. Observe the precautions in "[Safety First—For You and Your System.](#)"
2. Unscrew the thumbscrew at the back of the system. See [Figure 4-2.](#)
3. Slide the system cover backward about an inch, and grasp the cover on both sides.
4. Carefully lift the cover away from the system.

Figure 4-2. Removing the System Cover



### Replacing the System Cover

1. Ensure that you did not leave tools or parts inside the system.
  2. Place the system cover over the sides of the chassis, and slide the cover forward until it snaps into place. See [Figure 4-2.](#)
  3. Tighten the thumbscrew at the back of the system to secure the cover.
-

## Checking the Equipment

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

### Troubleshooting an Integrated NIC

#### Problem

- 1 NIC cannot communicate with network.
- 1 NIC cable is faulty.
- 1 NIC, hub, and switch configuration settings do not respond.

#### Action

1. Connect a keyboard, mouse, and monitor to the NAS system.
2. Check the appropriate indicator on the NIC connector. See [Figure 2-3](#).
3. If the link indicator does not light, perform the following steps:
  - a. Check all cable connections.
  - b. Try changing the auto-negotiation setting, if possible.
  - c. Try another connector on the switch or hub.
4. 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.
5. Ensure that the appropriate drivers are installed and the protocols are bound.
6. Ensure that the NICs, hubs, and switches on the network are all set to the same data transmission speed.  
  
See the network equipment documentation for more information.
7. Ensure that all network cables are of the proper type and do not exceed the maximum length.
8. Run NIC diagnostics tests. See "[Running the NIC Diagnostics Program](#)."

### Troubleshooting the Serial Connector

#### Problem

- 1 You cannot access the NAS system through console redirection.

 **NOTE:** For more information about using console redirection, see "[Using Console Redirection](#)."

#### Action

1. Turn off the NAS system and any device connected to the serial connector.
2. Ensure you are using a null modem serial cable.
3. Swap the cable with a working cable.
4. Turn on the client system.
5. Turn on the NAS system.  
  
 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.
6. Use the System Setup program to ensure that console redirection is enabled. See your *User's Guide* for more information about using the System Setup program.

If the problem is resolved, the interface cable must be replaced. See "[Getting Help](#)."

---

## Troubleshooting Hard Drives

#### Problem

- 1 The hard drive fails.

#### Action

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

1. Turn off the system.

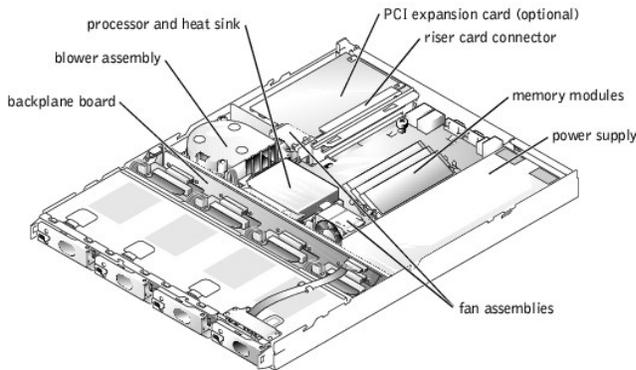
2. Remove the drive carrier and install it in another drive bay. See "[Removing and Installing a Hard Drive](#)" for information about installing hard drives.
3. If the hard drive is working properly in the new drive bay, the backplane board has a defective connector and must be replaced. See "[Getting Help.](#)"
4. If the hard drive is not working properly in the new drive bay, run the hard drive diagnostics tests. See "Running Hard-Drive Diagnostics Tests."
5. If the problem is not resolved, see "[Getting Help.](#)"

---

## Inside the System

In [Figure 4-3](#), the system cover and front panel are removed to provide an interior view of the system.

Figure 4-3. Inside the System



The system board holds the system's control circuitry and other electronic components. Several hardware options such as the processors and memory are installed directly on the system board. The system board can accommodate two PCI expansion cards.

The hard drive bays provide space for up to four IDE hot-plug drives. Power is supplied to the backplane board, the system board, and internal peripherals through a power supply.

---

## Troubleshooting a Wet System

### Problem

- 1 Liquid spills
- 1 Splashes
- 1 Excessive humidity

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover.](#)"
3. Remove any expansion cards, if installed. See "[Adding or Removing an Expansion Card.](#)"
4. Allow the system to dry thoroughly for at least 24 hours.
5. Connect a keyboard, mouse, and monitor to the NAS system.
6. Replace the system cover, reconnect the system to the electrical outlet, and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

If the system does not start up properly, see "[Getting Help.](#)"

7. If the system starts up normally, shut down the system and reinstall the expansion cards you removed in step 3.
8. Replace the system cover, reconnect the system to the electrical outlet, and turn on the system.
9. Run the system board tests in the System Diagnostics to confirm that the system works properly. See "[Running System Diagnostics.](#)"

If the tests did not complete successfully, see "[Getting Help.](#)"

---

## Troubleshooting a Damaged System

### Problem

- 1 System dropped or damaged.

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Check the following connections:
  - 1 Expansion-card connections to the system board
  - 1 Drive-carrier connections to the backplane board
4. Ensure that all cables are properly connected and all component connectors are properly seated.
5. Connect a keyboard, mouse, and monitor to the NAS system.
6. Replace the system cover, reconnect the system to the electrical outlet, and turn on the system.
7. Run the system board tests in the System Diagnostics. See "[Running System Diagnostics](#)."

If the tests did not complete successfully, see "[Getting Help](#)."

---

## Troubleshooting the System Battery

### Problem

- 1 Error message shows problem with the battery.
- 1 System Setup utility loses the system configuration information.
- 1 System date and time do not stay current.

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Check the connection of the battery to the system board.

See "[Replacing the System Battery](#)" in "[Installing and Replacing System Components](#)."

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

4. Replace the system cover, reconnect the system to the electrical outlet, and turn on the system.

**📌 NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

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

If the problem is not resolved by replacing the battery, see "[Getting Help](#)."

---

## Troubleshooting the Power Supply

### Problem

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

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Check the connection of the power cable to the power supply and the outlet.
3. Turn on the system.

**📌 NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

4. If the problem is not resolved, check the LED indicator code on the power supply. For more information on power supply LED indicators, see "[Back-Panel Indicators](#)."
5. If the problem is still not resolved, replace the power supply. See "Removing and Replacing the Power Supply."

See "[Getting Help](#)."

---

## Troubleshooting the Cooling Fans

### Problem

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

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Lift the fan from the chassis.

See "[Removing and Replacing a Blower or Fan Assembly](#)" in "[Installing and Replacing System Components](#)" for information about removing the fan.

4. Reseat the fan.

Ensure that the fan connector is firmly seated.

5. Replace the system cover.
6. Connect the system to an electrical outlet, and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

If the problem is resolved, you are finished with this procedure.

If the problem persists, replace the fan. See "[Removing and Replacing a Blower or Fan Assembly](#)."

7. If the replacement fan does not operate, one of the fan connectors is faulty.

See "[Getting Help](#)."

---

## Troubleshooting an Expansion Card

### Problem

- 1 Expansion card does not perform as expected.

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Verify that the expansion card is firmly seated in its connector and the riser card is firmly seated in the riser-card connector. To locate these connectors, see "[Upgrading the Processor](#)."
4. Verify that the appropriate cables are firmly connected to the expansion-card connector.
5. Replace the system cover.
6. Connect the system to an electrical outlet and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

If the problem is resolved, you are finished with this procedure.

If the problem persists, continue to step 7.

7. Turn off the system and disconnect the system from the electrical outlet.
  8. Remove the system cover.
  9. Remove the expansion card. See "[Adding or Removing an Expansion Card](#)."
  10. Connect a keyboard, mouse, and monitor to the NAS system.
  11. Replace the system cover, connect the system to an electrical outlet, and turn on the system.
  12. Reinstall the expansion card.
- 

## Troubleshooting System Memory

## Problem

- 1 Faulty memory module
- 1 Faulty system board

## Action

1. Connect a keyboard, mouse, and monitor to the NAS system.
2. Turn on the power to the system and attached peripherals.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

3. Enter the System Setup program to check the system memory setting.  
See "Using the System Setup Utility" in the *User's Guide* for instructions.
4. If the amount of memory installed matches the system memory setting, go to step 15.
5. If the amount of memory installed does not match the system memory setting, turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
6. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
7. Reseat the memory modules in their sockets. See "[Adding System Memory](#)."
8. Replace the system cover, reconnect the system to the power source, and turn on the system.
9. Enter the System Setup utility and check the system memory again.
10. If the amount of memory installed still does not match the system memory setting, turn off the system and disconnect the system from the electrical outlet.
11. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
12. Swap the memory modules with two of the same capacity.
13. Replace the system cover, reconnect the system to an electrical outlet, and turn on the system.
14. Enter the System Setup utility to check the system memory setting.  
  
If the amount of memory installed matches the system memory setting, you are finished with this procedure.  
  
If the amount of memory installed still does not match the system memory setting, continue to the next step.
15. Run the system memory test in the System Diagnostics. See "[Running System Diagnostics](#)."  
  
If the test does not complete successfully, see "[Getting Help](#)."

---

## Troubleshooting the System Board

### Problem

- 1 Error message indicates a system board problem.

### Action

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Remove the expansion card, if installed. See "[Adding or Removing an Expansion Card](#)."
4. Connect a keyboard, mouse, and monitor to the NAS system.
5. Replace the system cover, reconnect the system to the power source, and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

6. Run the system board tests in the System Diagnostics. See "[Running System Diagnostics](#)."  
  
If the tests do not run successfully, see "[Getting Help](#)."
  7. Turn off the system, disconnect it from the power source, and remove the system cover.
  8. Reinstall the expansion card.
  9. Replace the system cover, reconnect the system to the power source, and turn on the system.
  10. Run the system board tests again.  
  
If the tests do not complete successfully, see "[Getting Help](#)."
-

## Recovering the System

Because your NAS system is designed to have redundancy, it can recover from certain hardware and software failures. In some situations, it can automatically recover, and in others, you must have administrator privileges and manually intervene to recover the system.

See your *System Administrator's Guide* for information about recovering the system.

---

## Changing or Clearing the Supervisor Password

Using the System Setup utility, you can change or clear a supervisor password for the BIOS Setup utility. The password is required when the system is booted, or when the user enters the BIOS Setup utility. A supervisor has access to all features in the BIOS Setup utility.

 **NOTE:** The system password is disabled by default. Because the password is required to enter the BIOS Setup utility, do not enable it unless security is a concern.

To change a supervisor password, perform the following steps:

1. Connect a keyboard, monitor, and mouse to the system.
2. Turn on or restart your NAS system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

Press <F2> immediately after you see the following message:

Press <F2> to enter the Function Select menu.

If you wait too long and your operating system begins to load into memory, allow the system to complete the load operation, and then shut down the NAS system and try again.

3. When the **Function Select** menu appears, press <1> to run the System Setup utility.
  4. From the main menu, select **Security**.
  5. Highlight **Change System Password** and press <Enter>.
  6. Enter the old password in the dialog box that appears.
  7. When prompted, enter the new password (no more than six letters or numbers); or, to clear a password, leave this field blank.
  8. Press <Enter>.
  9. When prompted, select either **Setup** or **Always**. If you select **Setup**, the password will only be requested when entering the System Setup utility. If you select **Always**, the password will be requested anytime the system is rebooted.
  10. To confirm the new password, enter the password again in the dialog box that appears.
  11. Press <Enter>.
- 

## Disabling a Forgotten Password

If you forget your supervisor password, you cannot operate your system or change settings in the BIOS Setup utility until you reset the password. To disable your password, perform the following steps:

1. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Move the jumper plug from pin 2 to pins 1 and 2.

The jumper plug, which is labeled **J5** on the system board, is located next to the DIMMs and the power supply.

4. Replace the system cover, connect the system to the electrical outlet, and turn on the system.

The password clears.

5. Turn off the system, including any attached peripherals, and disconnect the system from the electrical outlet.
6. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
7. Move the jumper plug back to its original position.
8. Replace the system cover, connect the system to the electrical outlet, and turn on the system.

The system does not have password protection. See your *User's Guide* for information about setting the password.

---



## Installing and Replacing System Components

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

- [System Board Components](#)
- [Removing and Installing a Hard Drive](#)
- [Adding or Removing an Expansion Card](#)
- [Adding System Memory](#)
- [Upgrading the Processor](#)
- [Removing and Replacing a Blower or Fan Assembly](#)
- [Replacing the System Battery](#)
- [Replacing the Power Supply](#)

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This section describes how to install the following system components:

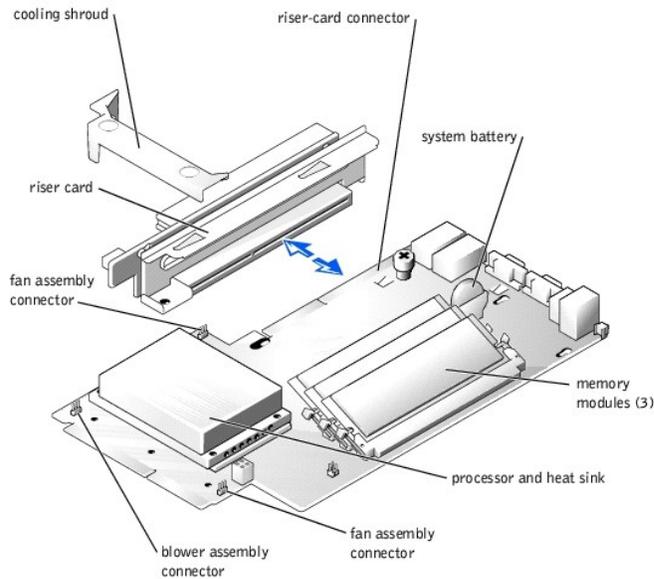
- 1 Hard drives
- 1 Expansion card
- 1 Memory upgrades
- 1 Processor upgrades
- 1 Blower and fan assemblies
- 1 System battery
- 1 Power supply

---

## System Board Components

When installing and replacing system board components, use [Figure 5-1](#) to locate the these components.

**Figure 5-1. System Board Components and Connectors**



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## Removing and Installing a Hard Drive

Your system comes with four hot-plug IDE hard drives. While hard drives can be removed and installed with the system turned on, the RAID set may need to be updated. For more information, see your *System Administrator's Guide*.

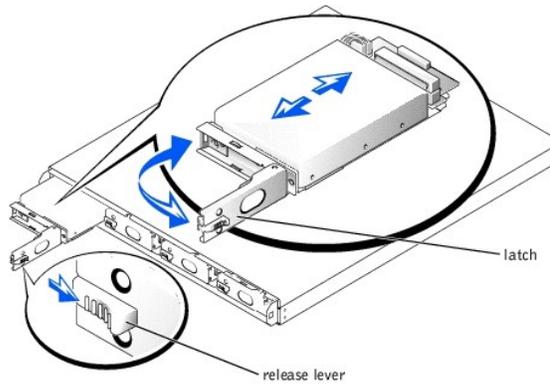
To remove a hard drive, perform the following steps:

1. Remove the front panel. See "[Removing and Replacing the Front Panel](#)."

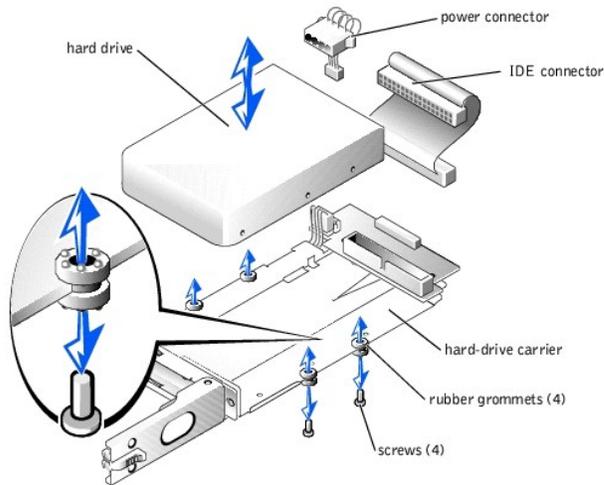
2. Push the release lever to the right. See [Figure 5-2](#).
3. Open the latch and use it to pull the drive carrier out of the drive bay.
4. Remove the screws on the bottom of the carrier and remove the drive from the carrier. See [Figure 5-3](#).

**NOTE:** Do not remove rubber grommets.

**Figure 5-2. Releasing the Hard-Drive Latch**



**Figure 5-3. Removing the Hard Drive From the Drive Carrier**



5. Disconnect the drive carrier's power and IDE cables from the drive.
6. Connect the power and IDE cables to the new drive.
7. Place the drive back in the carrier and reattach the screws that you removed in step 4.
8. Insert the carrier, with the latch open, into the system.
9. Push the carrier into the drive bay until it is fully seated in the backplane connector.
10. Close the latch.
11. Replace the front panel.

If it is necessary to reinstall your system, see your *System Administrator's Guide*.

## Adding or Removing an Expansion Card

The system supports up to two PCI expansion cards, which are installed in connectors on a riser board at the back of the system.

### Installing an Expansion Card

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Remove the plastic insert adjacent to the expansion card slots and then remove the filler bracket on the slot that you are going to use. See [Figure 5-4](#).

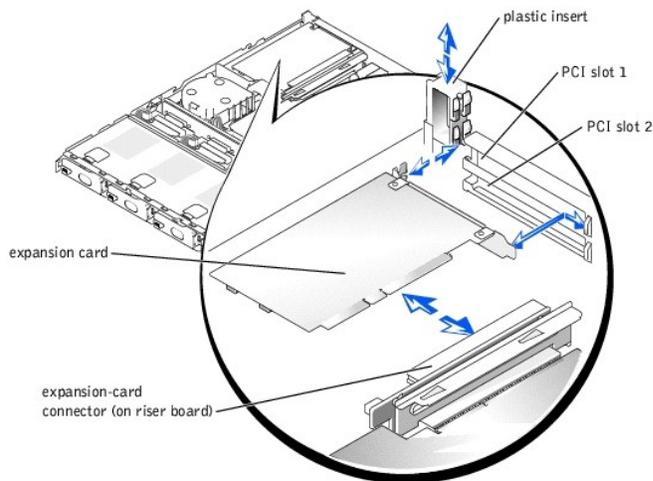
PCI 1 slot is on top and the PCI 2 slot is on bottom.

**🔍 NOTE:** Keep this bracket in the event you need to remove the expansion card. Filler brackets must be installed over empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and help keep the system properly cooled by promoting airflow inside the system.

4. Insert the expansion card firmly into the expansion-card connector on the riser board until the card is fully seated, being careful not to remove the riser card from the system board.
5. Replace the plastic insert, ensuring that the insert is oriented exactly as shown in [Figure 5-4](#).
6. Connect the expansion-card cable to the external expansion card connector.
7. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

**🔍 NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

**Figure 5-4. Installing an Expansion Card**



## Removing an Expansion Card

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Disconnect the cable that is connected to the expansion card.
4. Remove the plastic insert adjacent to the expansion card slots. See [Figure 5-4](#).
5. Grasp the expansion card and carefully pull it away from the riser-card connector.
6. If you are permanently removing the card, replace the metal filler bracket over the empty card-slot opening.

**🔍 NOTE:** Filler brackets must be installed over empty expansion card slots to maintain Federal Communications Commission (FCC) certification of the system. The brackets also keep dust and dirt out of the system and help keep the system properly cooled by promoting airflow inside the system.

7. Replace the plastic insert, ensuring that the insert is oriented exactly as shown in [Figure 5-4](#).
8. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

**🔍 NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

---

## Adding System Memory

The three memory module sockets are located on the system board adjacent to the power supply. See [Figure 5-1](#).

You can upgrade the system memory by installing combinations of registered memory modules. If you receive an error message stating that maximum memory has been exceeded, see "[Indicators, Messages, and Codes](#)" for more information. You can purchase memory upgrade kits from Dell.

 **NOTE:** The memory modules must be PC-2100 compliant. For technical specifications for memory modules, see your *User's Guide*.

## Installing Memory Modules

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Locate the memory module sockets in which you want to install or replace the memory module(s). See [Figure 5-5](#).
4. Press the ejectors on the memory module socket down and out, as shown in [Figure 5-5](#), to allow the memory module to be inserted into the socket.
5. Align the memory module's edge connector with the alignment keys of the memory module socket, and insert the memory module in the socket.

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

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

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

7. Repeat step 3 through step 6 of this procedure to install the remaining memory modules.
8. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

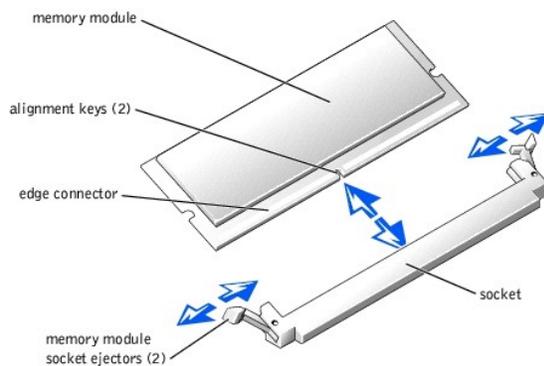
9. (Optional) Press <F2> to enter the System Setup utility, and check the **System Memory** setting on the main Setup screen.

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

If the value is incorrect, one or more of the memory modules may not be installed properly.

10. Repeat step 1 through step 8 of this procedure, checking to ensure that the memory modules are firmly seated in their sockets.
11. Run the system memory test in the System Diagnostics. See "[Running System Diagnostics](#)."

**Figure 5-5. Installing and Removing a Memory Module**



## Removing Memory Modules

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the Front Panel](#)" and "[Removing and Replacing the System Cover](#)."
3. Locate the memory module sockets from which you want to remove the memory module(s). See [Figure 5-1](#).
4. Press down and out on the ejectors on each end of the socket until the memory module pops out of the socket. See [Figure 5-5](#).
5. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

**NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

## Upgrading the Processor

It is possible to upgrade your processor to take advantage of future options in speed and functionality. Each processor and its associated Level 2 (L2) cache memory are contained in a pin grid array (PGA) package that is installed in a ZIF socket on the system board.

The following items are included in the processor upgrade kit:

- 1 Processor
- 1 Heat sink
- 1 Securing clip

## Replacing the Processor

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

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."

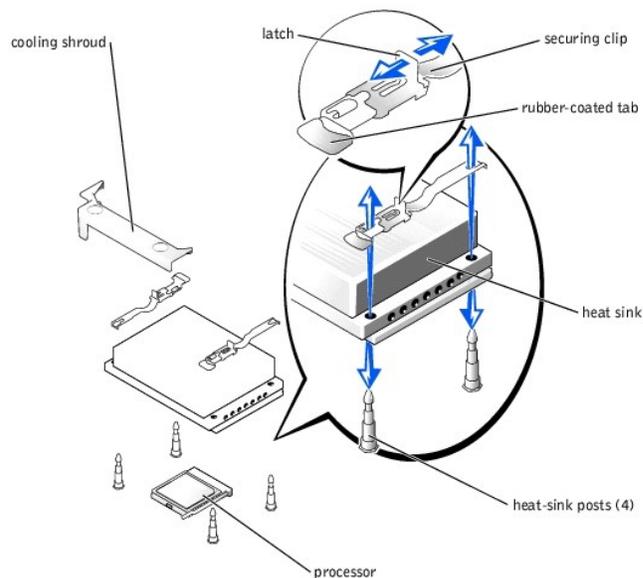
**NOTICE:** The processor and heat sink can become extremely hot. Be sure the processor has had sufficient time to cool before handling.

3. Remove the cooling shroud.
4. Pushing down with one hand on the securing clip's rubber-coated tab, use the other hand to pull the latch on the securing clip on the left to release the securing clip from the heat-sink posts. See [Figure 5-6](#).
5. Remove the securing clip.

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

6. Repeat step 4 and step 5 to remove the securing clip on the right.

Figure 5-6. Removing the Securing Clip



7. Remove the heat sink.
8. Pull the socket release lever straight up until the processor is released from the socket. See [Figure 5-7](#).
9. Lift the processor out of the socket and leave the release lever up so that the socket is ready for the new processor.

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

10. Unpack the new processor.

If any of the pins on the processor appear bent, see ["Getting Help."](#)

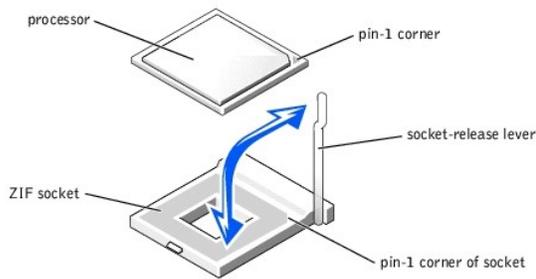
11. Align the pin-1 corner of the processor with the pin-1 corner of the ZIF socket. See [Figure 5-7](#).

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

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

12. Install the processor in the socket.

**Figure 5-7. Installing the Processor in the Socket**



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

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

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

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

13. Place the new heat sink on top of the processor, aligning the holes on both sides of the heat sink with the heat-sink posts on the system chassis.
14. Orient the securing clips as shown in [Figure 5-6](#).
15. Position each securing clip over the heat-sink posts, then snap them onto the posts.
16. While holding down the rubber-coated tab with one hand, push the latch on the securing clip on the right until it locks the clip onto the post. While pressing the heat sink down, repeat this step for the securing clip on the left.
17. Replace the cooling shrouds.
18. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

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

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

See your *User's Guide* for instructions on using the System Setup utility.

20. Run the System Diagnostics to verify that the new processor operates correctly.

See ["Running System Diagnostics"](#) for information about running the diagnostics and troubleshooting processor problems.

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## Removing and Replacing a Blower or Fan Assembly

The blower assembly, which is located behind IDE hard drive 1, contains one fan. In addition, two smaller fan assemblies are located near the processor and heat sink.

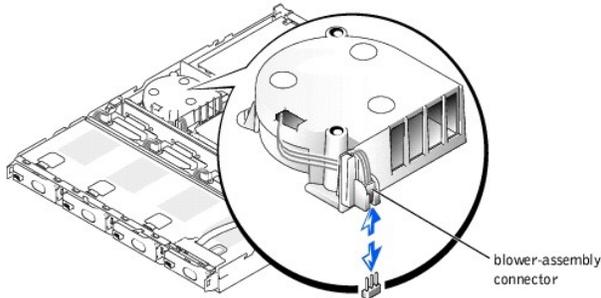
### Removing a Blower or Fan Assembly

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

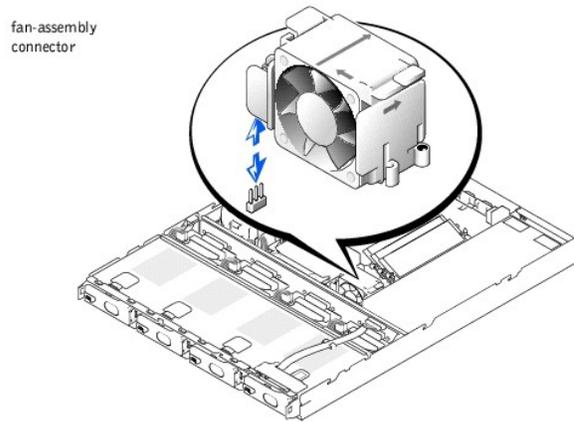
 **CAUTION:** Before you perform this procedure, you must turn off the system and disconnect it from the power source. For more information, see ["Safety First—For You and Your System"](#) in ["Troubleshooting Your System."](#)

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Lift the blower or fan assembly out of the chassis carefully, ensuring that the connector disconnects from the system board. See [Figure 5-8](#) (blower assembly) and [Figure 5-9](#) and [Figure 5-10](#) (fan assemblies).

**Figure 5-8. Removing the Blower Assembly**



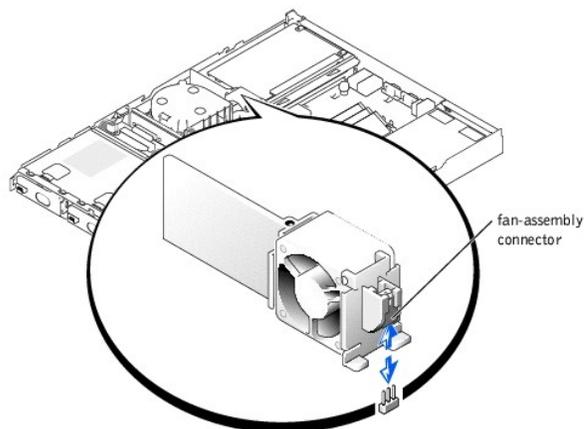
**Figure 5-9. Removing the Fan Assembly**



4. Align the replacement blower or fan assembly with the connector on the system board and the pegs on the chassis.
5. Push down on the blower or fan assembly until it is properly seated on the chassis pegs.
6. Attach the blower or fan assembly connector to the three-pin connector on the system board.
7. Replace the system cover and turn on the system.

**NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

**Figure 5-10. Removing the Fan Assembly**



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## Replacing the System Battery

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

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

To determine if the battery needs replacing:

1. Re-enter the time and date through the System Setup utility. For more information on using the utility, see your *User's Guide*.
2. Turn off the system and disconnect it from electrical power for a few hours.
3. After several hours, reconnect the system to a power source and turn it back on.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

4. Enter the System Setup utility.

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

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

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

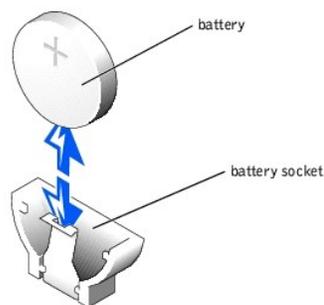
You can operate the system without a battery; however, the system configuration information maintained by the battery in SDRAM is erased each time you shut down the system. Therefore, you must re-enter the system configuration information and reset the options each time the system boots until you replace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

To replace the system battery, perform the following steps:

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

1. Enter the System Setup utility and, if possible, make a printed copy of the System Setup screens.  
See "Using the System Setup Utility," in the *User's Guide* for instructions about using the utility.
2. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
3. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
4. Locate the battery on the system board. See [Figure 5-1](#) for the battery location.
5. Grasp the battery with your fingers and pull up to release the battery from the battery socket.
6. Place the new battery with the side labeled "+" facing toward the open side of the battery socket. See [Figure 5-11](#).

**Figure 5-11. Replacing the Battery**



7. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

 **NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

8. Enter the System Setup utility to confirm that the battery operates properly.
9. From the main screen, select **System Time** to enter the correct time and date.

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

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

11. After an hour, reconnect the system to a power source and turn it on.
12. Enter the System Setup utility. If the time and date are still incorrect, see "[Getting Help](#)."

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## Replacing the Power Supply

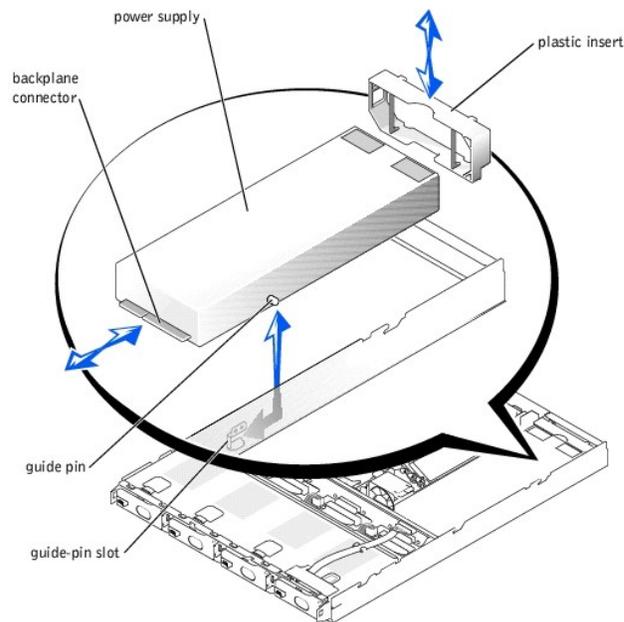
The system supports a single power supply located behind IDE hard drive 3.

To replace a failed power supply, perform the following steps.

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

1. Turn off the system and attached peripherals, and disconnect the system from the electrical outlet.
2. Remove the system cover. See "[Removing and Replacing the System Cover](#)."
3. Pull up to remove the plastic insert that secures the power supply inside the system. See [Figure 5-12](#).
4. Grasp the front of the power supply and push it toward the back of the system, disengaging it from the backplane connector.

**Figure 5-12. Removing and Replacing the Power Supply**



5. To install the replacement power supply, insert the rear guide pins on the power supply into the guide-pin slots on the chassis, lower the power supply into the chassis, and then push the power supply toward the front of the system until the connector is firmly seated in the backplane.
6. Replace the plastic insert removed in step 3.
7. Replace the system cover, and then reconnect the system and peripherals to the power source and turn on the system.

**📌 NOTE:** When you turn on the system, press the power button for *less than* two seconds. If you press the power button for longer than 3 seconds, the NAS system shuts down and automatically rebuilds its RAID arrays, which could impact system performance for several hours.

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## Getting Help

### Dell™ PowerVault™ 725N Systems Installation and Troubleshooting Guide

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

## Technical Assistance

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

1. Complete the procedures in "[Troubleshooting Your System](#)."
2. Run the system diagnostics and record any information provided.
3. Use Dell's extensive suite of online services available at Dell Support at [support.dell.com](http://support.dell.com) for help with installation and troubleshooting procedures.

For more information, see "[Online Services](#)."

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

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

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

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

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

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

## Online Services

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

You can contact Dell electronically using the following addresses:

- 1 World Wide Web

[www.dell.com/](http://www.dell.com/)

[www.dell.com/ap/](http://www.dell.com/ap/) (for Asian/Pacific countries only)

[www.euro.dell.com](http://www.euro.dell.com) (for Europe only)

[www.dell.com/la/](http://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](mailto:support@us.dell.com)

[apsupport@dell.com](mailto:apsupport@dell.com) (for Asian/Pacific countries only)

[support.euro.dell.com](mailto:support.euro.dell.com) (for Europe only)

- 1 Electronic Quote Service

[sales@dell.com](mailto:sales@dell.com)

[apmarketing@dell.com](mailto: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, use your touch-tone telephone to select the subjects that correspond to your questions.

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

## Automated Order-Status Service

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

## Technical Support Service

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

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

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## Dell Enterprise Training and Certification

Dell Enterprise Training and Certification is available; see [www.dell.com/training](http://www.dell.com/training) for more information. This service may not be offered in all locations.

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## Problems With Your Order

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

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## 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](http://www.dell.com). For the telephone number to call to speak to a sales specialist, see the contact information for your region.

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## Returning Items for Warranty Repair or Credit

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

1. Call Dell to obtain a Return Material Authorization Number, and write it clearly and prominently on the outside of the box.  
For the telephone number to call, see the contact information for your region.
2. Include a copy of the invoice and a letter describing the reason for the return.
3. Include a copy of any diagnostic information indicating the tests you have run and any error messages reported by the system diagnostics.
4. Include any accessories that belong with the item(s) being returned (such as power cables, media such as CDs and diskettes, and guides) if the return is for credit.
5. Pack the equipment to be returned in the original (or equivalent) packing materials.

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

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

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## 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.

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

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

## Contacting Dell

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

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

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

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

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

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
<b>Anguilla</b>	General Support	toll-free: 800-335-0031
<b>Antigua and Barbuda</b>	General Support	1-800-805-5924
<b>Argentina (Buenos Aires)</b>  International Access Code: <b>00</b>  Country Code: <b>54</b>  City Code: <b>11</b>	Website: <a href="http://www.dell.com.ar">www.dell.com.ar</a>	
	Tech Support and Customer Care	toll-free: 0-800-444-0733
	Sales	0-810-444-3355
	Tech Support Fax	11 4515 7139
	Customer Care Fax	11 4515 7138
<b>Aruba</b>	General Support	toll-free: 800-1578
<b>Australia (Sydney)</b>  International Access Code: <b>0011</b>  Country Code: <b>61</b>  City Code: <b>2</b>	E-mail (Australia): <a href="mailto:au_tech_support@dell.com">au_tech_support@dell.com</a>	
	E-mail (New Zealand): <a href="mailto:nz_tech_support@dell.com">nz_tech_support@dell.com</a>	
	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	
<b>Austria (Vienna)</b>  International Access Code: <b>900</b>  Country Code: <b>43</b>  City Code: <b>1</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
	E-mail: <a href="mailto:tech_support_central_europe@dell.com">tech_support_central_europe@dell.com</a>	
	Home/Small Business Sales	01 795 67602
	Home/Small Business Fax	01 795 67605
	Home/Small Business Customer Care	01 795 67603
	Preferred Accounts/Corporate Customer Care	0660 8056
	Home/Small Business Technical Support	01 795 67604
	Preferred Accounts/Corporate Technical Support	0660 8779
Switchboard	01 491 04 0	
<b>Bahamas</b>	General Support	toll-free: 1-866-278-6818
<b>Barbados</b>	General Support	1-800-534-3066
<b>Belgium (Brussels)</b>  International Access Code: <b>00</b>  Country Code: <b>32</b>  City Code: <b>2</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
	E-mail: <a href="mailto:tech_be@dell.com">tech_be@dell.com</a>	
	E-mail for French Speaking Customers: <a href="mailto:support.euro.dell.com/be/fr/emaildell/">support.euro.dell.com/be/fr/emaildell/</a>	
	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	
<b>Bermuda</b>	General Support	1-800-342-0671
<b>Bolivia</b>	General Support	toll-free: 800-10-0238
<b>Brazil</b>  International Access Code: <b>00</b>	Website: <a href="http://www.dell.com/br">www.dell.com/br</a>	
	Customer Support, Technical Support	0800 90 3355

Country Code: 55	Tech Support Fax	51 481 5470
	Customer Care Fax	51 481 5480
City Code: 51	Sales	0800 90 3390
<b>British Virgin Islands</b>	General Support	toll-free: 1-866-278-6820
Brunei Country Code: 673	Customer Technical Support (Penang, Malaysia)	604 633 4966
	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario) International Access Code: 011	Automated Order-Status System	toll-free: 1-800-433-9014
	AutoTech (automated technical support)	toll-free: 1-800-247-9362
	Customer Care (from outside Toronto)	toll-free: 1-800-387-5759
	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
<b>Cayman Islands</b>	General Support	1-800-805-7541
Chile (Santiago) Country Code: 56 City Code: 2	Sales, Customer Support, and Technical Support	toll-free: 1230-020-4823
China (Xiamen) Country Code: 86 City Code: 592	Tech Support website: <a href="http://support.ap.dell.com/china">support.ap.dell.com/china</a>	
	Tech Support E-mail: <a href="mailto:cn_support@dell.com">cn_support@dell.com</a>	
	Tech Support Fax	818 1350
	Home and Small Business Technical Support	toll-free: 800 858 2437
	Corporate Accounts Technical Support	toll-free: 800 858 2333
	Customer Experience	toll-free: 800 858 2060
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2062
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
Large Corporate Accounts West	toll-free: 800 858 2811	
Large Corporate Accounts Spare Parts	toll-free: 800 858 2621	
<b>Colombia</b>	General Support	980-9-15-3978
<b>Costa Rica</b>	General Support	0800-012-0435
Czech Republic (Prague) International Access Code: 00 Country Code: 420 City Code: 2	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
	E-mail: <a href="mailto:czech_dell@dell.com">czech_dell@dell.com</a>	
	Technical Support	02 22 83 27 27
	Customer Care	02 22 83 27 11
	Fax	02 22 83 27 14
	TechFax	02 22 83 27 28
	Switchboard	02 22 83 27 11
Denmark (Copenhagen) International Access Code: 00 Country Code: 45	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
	E-mail Support (portable computers): <a href="mailto:den_nbk_support@dell.com">den_nbk_support@dell.com</a>	
	E-mail Support (desktop computers): <a href="mailto:den_support@dell.com">den_support@dell.com</a>	
	E-mail Support (servers): <a href="mailto:Nordic_server_support@dell.com">Nordic_server_support@dell.com</a>	
	Technical Support	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Fax Switchboard (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000

	Fax Switchboard (Home/Small Business)	3287 5001
<b>Dominica</b>	General Support	toll-free: 1-866-278-6821
<b>Dominican Republic</b>	General Support	1-800-148-0530
<b>Ecuador</b>	General Support	toll-free: 999-119
<b>El Salvador</b>	General Support	01-899-753-0777
<b>Finland (Helsinki)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>990</b>	E-mail: <a href="mailto:fin_support@dell.com">fin_support@dell.com</a>	
Country Code: <b>358</b>	E-mail Support (servers): <a href="mailto:Nordic_support@dell.com">Nordic_support@dell.com</a>	
City Code: <b>9</b>	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
<b>France (Paris) (Montpellier)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/fr/fr/emaiddell/">support.euro.dell.com/fr/fr/emaiddell/</a>	
Country Code: <b>33</b>	<b>Home and Small Business</b>	
City Codes: <b>(1) (4)</b>	Technical Support	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	<b>Corporate</b>	
	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
<b>Germany (Langen)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:tech_support_central_europe@dell.com">tech_support_central_europe@dell.com</a>	
Country Code: <b>49</b>	Technical Support	06103 766-7200
City Code: <b>6103</b>	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
<b>Grenada</b>	General Support	toll-free: 1-866-540-3355
<b>Guatemala</b>	General Support	1-800-999-0136
<b>Guyana</b>	General Support	toll-free: 1-877-270-4609
<b>Hong Kong</b>	Technical Support (Dimension™ and Inspiron™)	296 93188
International Access Code: <b>001</b>	Technical Support (OptiPlex™, Latitude™, and Dell Precision™)	296 93191
Country Code: <b>852</b>	Customer Service (non-technical, post-sales issues)	800 93 8291
	Transaction Sales	toll-free: 800 96 4109
	Large Corporate Accounts HK	toll-free: 800 96 4108
	Large Corporate Accounts GCP HK	toll-free: 800 90 3708
<b>India</b>	Technical Support	1600 33 8045
	Sales	1600 33 8044
<b>Ireland (Cherrywood)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>16</b>	E-mail: <a href="mailto:dell_direct_support@dell.com">dell_direct_support@dell.com</a>	
Country Code: <b>353</b>	Ireland Technical Support	1850 543 543
City Code: <b>1</b>	U.K. Technical Support (dial within U.K. only)	0870 908 0800
	Home User Customer Care	01 204 4095
	Small Business Customer Care	01 204 4444
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care	01 204 4003
	Ireland Sales	01 204 4444

	U.K. Sales (dial within U.K. only)	0870 907 4000
	SalesFax	01 204 0144
	Fax	01 204 5960
	Switchboard	01 204 4444
<b>Italy (Milan)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/it/it/emaildell/">support.euro.dell.com/it/it/emaildell/</a>	
Country Code: <b>39</b>	<b>Home and Small Business</b>	
City Code: <b>02</b>	Technical Support	02 577 826 90
	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	<b>Corporate</b>	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
<b>Jamaica</b>	General Support (dial from within Jamaica only)	1-800-682-3639
<b>Japan (Kawasaki)</b>	Website: <a href="http://support.jp.dell.com">support.jp.dell.com</a>	
International Access Code: <b>001</b>	Technical Support (servers)	toll-free: 0120-1984-98
Country Code: <b>81</b>	Technical Support outside of Japan (servers)	81-44-556-4162
City Code: <b>44</b>	<b>Technical Support (Dimension™ and Inspiron™)</b>	toll-free: 0120-1982-26
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	<b>Technical Support (Dell Precision™, OptiPlex™, and Latitude™)</b>	toll-free: 0120-1984-33
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	24-Hour Automated Order Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Large Corporate Accounts Sales (over 3500 employees)	044-556-3430
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-1469
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Faxbox Service	044-556-3490
	Switchboard	044-556-4300
<b>Korea (Seoul)</b>	Technical Support	toll-free: 080-200-3800
International Access Code: <b>001</b>	Sales	toll-free: 080-200-3600
Country Code: <b>82</b>	Customer Service (Seoul, Korea)	toll-free: 080-200-3800
City Code: <b>2</b>	Customer Service (Penang, Malaysia)	604 633 4949
	Fax	2194-6202
	Switchboard	2194-6000
<b>Latin America</b>	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
<b>Luxembourg</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:tech_be@dell.com">tech_be@dell.com</a>	
Country Code: <b>352</b>	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
<b>Macao</b>	Technical Support	toll-free: 0800 582
Country Code: <b>853</b>	Customer Service (Penang, Malaysia)	604 633 4949
	Transaction Sales	toll-free: 0800 581
<b>Malaysia (Penang)</b>	Technical Support	toll-free: 1 800 888 298

International Access Code: <b>00</b>	Customer Service	04 633 4949
Country Code: <b>60</b>	Transaction Sales	toll-free: 1 800 888 202
City Code: <b>4</b>	Corporate Sales	toll-free: 1 800 888 213
<b>Mexico</b>	Customer Technical Support	001-877-384-8979
International Access Code: <b>00</b>		or 001-877-269-3383
Country Code: <b>52</b>	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
<b>Montserrat</b>	General Support	toll-free: 1-866-278-6822
<b>Netherlands Antilles</b>	General Support	001-800-882-1519
<b>Netherlands (Amsterdam)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/nl/nl/emaildell/">support.euro.dell.com/nl/nl/emaildell/</a>	
Country Code: <b>31</b>	Technical Support	020 674 45 00
City Code: <b>20</b>	<b>Home/Small and Medium Business</b>	020 674 55 00
	Home/Small and Medium Business Fax	020 674 47 75
	Home/Small and Medium Business Customer Care	020 674 42 00
	<b>Corporate</b>	020 674 50 00
	Corporate Fax	020 674 47 79
	Corporate Customer Care	020 674 43 25
<b>New Zealand</b>	E-mail (New Zealand): <a href="mailto:nz_tech_support@dell.com">nz_tech_support@dell.com</a>	
International Access Code: <b>00</b>	E-mail (Australia): <a href="mailto:au_tech_support@dell.com">au_tech_support@dell.com</a>	
Country Code: <b>64</b>	Home and Small Business	0800 446 255
	Government and Business	0800 444 617
	Sales	0800 441 567
	Fax	0800 441 566
<b>Nicaragua</b>	General Support	001-800-220-1006
<b>Norway (Lysaker)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail Support (portable computers):	
Country Code: <b>47</b>	<a href="mailto:nor_nbk_support@dell.com">nor_nbk_support@dell.com</a>	
	E-mail Support (desktop computers):	
	<a href="mailto:nor_support@dell.com">nor_support@dell.com</a>	
	E-mail Support (servers):	
	<a href="mailto:nordic_server_support@dell.com">nordic_server_support@dell.com</a>	
	Technical Support	671 16882
	Relational Customer Care	671 17514
	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
<b>Panama</b>	General Support	001-800-507-0962
<b>Peru</b>	General Support	0800-50-669
<b>Poland (Warsaw)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>011</b>	E-mail: <a href="mailto:pl_support@dell.com">pl_support@dell.com</a>	
Country Code: <b>48</b>	Customer Service Phone	57 95 700
City Code: <b>22</b>	Customer Care	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
<b>Portugal</b>	E-mail: <a href="mailto:support.euro.dell.com/es/es/emaildell/">support.euro.dell.com/es/es/emaildell/</a>	
International Access Code: <b>00</b>	Technical Support	800 834 077
Country Code: <b>35</b>	Customer Care	800 300 415 or 800 834 075
	Sales	800 300 410 or 800 300 411 or

		800 300 412 or 121 422 07 10
	Fax	121 424 01 12
<b>Puerto Rico</b>	General Support	1-800-805-7545
<b>St. Kitts and Nevis</b>	General Support	toll-free: 1-877-441-4731
<b>St. Lucia</b>	General Support	1-800-882-1521
<b>St. Vincent and the Grenadines</b>	General Support	toll-free: 1-877-270-4609
<b>Singapore (Singapore)</b>	Technical Support	toll-free: 800 6011 051
International Access Code: <b>005</b>	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: <b>65</b>	Transaction Sales	toll-free: 800 6011 054
	Corporate Sales	toll-free: 800 6011 053
<b>South Africa (Johannesburg)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code:	E-mail: <a href="mailto:dell_za_support@dell.com">dell_za_support@dell.com</a>	
<b>09/091</b>	Technical Support	011 709 7710
Country Code: <b>27</b>	Customer Care	011 709 7707
City Code: <b>11</b>	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
<b>Southeast Asian and Pacific Countries</b>	Customer Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
<b>Spain (Madrid)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:support.euro.dell.com/es/es/emaildell/">support.euro.dell.com/es/es/emaildell/</a>	
Country Code: <b>34</b>	<b>Home and Small Business</b>	
City Code: <b>91</b>	Technical Support	902 100 130
	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	<b>Corporate</b>	
	Technical Support	902 100 130
	Customer Care	902 118 546
	Switchboard	91 722 92 00
	Fax	91 722 95 83
<b>Sweden (Upplands Vasby)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:swe_support@dell.com">swe_support@dell.com</a>	
Country Code: <b>46</b>	E-mail Support for Latitude and Inspiron: <a href="mailto:Swe-nbk_kats@dell.com">Swe-nbk_kats@dell.com</a>	
City Code: <b>8</b>	E-mail Support for OptiPlex: <a href="mailto:Swe_kats@dell.com">Swe_kats@dell.com</a>	
	E-mail Support for Servers: <a href="mailto:Nordic_server_support@dell.com">Nordic_server_support@dell.com</a>	
	Technical Support	08 590 05 199
	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	20 140 14 44
	Fax Technical Support	08 590 05 594
	Sales	08 590 05 185
<b>Switzerland (Geneva)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	E-mail: <a href="mailto:swisstech@dell.com">swisstech@dell.com</a>	
Country Code: <b>41</b>	E-mail for French-speaking HSB and Corporate Customers: <a href="mailto:support.euro.dell.com/ch/fr/emaildell/">support.euro.dell.com/ch/fr/emaildell/</a>	
City Code: <b>22</b>	Technical Support (Home and Small Business)	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
<b>Taiwan</b>	Technical Support (portable and desktop computers)	toll-free: 00801 86 1011
International Access Code: <b>002</b>	Technical Support (servers)	toll-free: 0080 60 1256
Country Code: <b>886</b>	Transaction Sales	toll-free: 0080 651 228
	Corporate Sales	or 0800 33 556 toll-free: 0080 651 227

		or 0800 33 555
<b>Thailand</b>	Technical Support	toll-free: 0880 060 07
International Access Code: <b>001</b>	Customer Service (Penang, Malaysia)	604 633 4949
Country Code: <b>66</b>	Sales	toll-free: 0880 060 09
<b>Trinidad/Tobago</b>	General Support	1-800-805-8035
<b>Turks and Caicos Islands</b>	General Support	toll-free: 1-866-540-3355
<b>U.K. (Bracknell)</b>	Website: <a href="http://support.euro.dell.com">support.euro.dell.com</a>	
International Access Code: <b>00</b>	Customer Care website: <a href="http://dell.co.uk/lca/customerservices">dell.co.uk/lca/customerservices</a>	
Country Code: <b>44</b>	E-mail: <a href="mailto:dell_direct_support@dell.com">dell_direct_support@dell.com</a>	
City Code: <b>1344</b>	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support (direct/PAD and general)	0870 908 0800
	Global Accounts Customer Care	01344 373 185
		or 01344 373 186
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	0870 908 0500
	Preferred Accounts (500-5000 employees) Customer Care	01344 373 196
	Central Government Customer Care	01344 373 193
	Local Government & Education Customer Care	01344 373 199
	Health Customer Care	01344 373 194
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
<b>Uruguay</b>	General Support	toll-free: 000-413-598-2521
<b>U.S.A. (Austin, Texas)</b>	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: <b>011</b>	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
Country Code: <b>1</b>	<b>Consumer (Home and Home Office)</b>	
	Customer Technical Support	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	DellNet™ Service and Support	toll-free: 1-877-Dellnet (1-877-335-5638)
	Software Application Support	toll-free: 1-800-433-9005
	Employee Purchase Program (EPP)	toll-free: 1-800-695-8133
	(Customer Service and Technical Support)	
	Financial Services website: <a href="http://www.dellfinancialservices.com">www.dellfinancialservices.com</a>	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	<b>Business</b>	
	Service and Technical Support	toll-free: 1-800-822-8965
	Employee Purchase Program (EPP)	toll-free: 1-800-695-8133
	(Customer Service and Technical Support)	
	<b>Public (government, education, and healthcare)</b>	
	Service and Technical Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP)	toll-free: 1-800-234-1490
	(Customer Service and Technical Support)	
	Dell Sales	toll-free: 1-800-289-3355
		or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)
<b>U.S. Virgin Islands</b>	General Support	1-877-673-3355
<b>Venezuela</b>	General Support	8001-3605

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