Dell™ PowerEdge™ 7150 Systems User's Guide

Notes, Notices, Cautions, and Warnings

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

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

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

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

Model EML

Initial release: 13 Dec 2000

Technical Specifications
Dell™ PowerEdge™ 7150 Systems User's Guide

Table A-1. Technical Specifications

Microprocessor	
Microprocessor type	one to four Intel 64-bit Intel® Itanium™ microprocessors with a minimum internal operating frequency of 733 MHz and an external operating frequency of 133 MHz
Front side bus speed	133 MHz (266 MHz double-pumped)
Internal cache	2- or 4-MB L3 cache
Expansion Bus	
Bus type	64-bit PCI
Expansion slots	Eight 66-MHz hot-pluggable slots on six PCI buses; two 33-MHz slots on a seventh PCI bus
Memory	
Architecture	registered PC-100-compliant DIMMs with CL2 timing
Memory module sockets	32 sockets per memory board; one or two memory boards
Memory module capacities	128-MB, 256-, or 512-MB; or 1-GB (when available)
Minimum RAM	1 GB
Maximum RAM	64 GB (when 1-GB memory modules are available)
Drives	
Diskette drive	one IDE diskette drive
Tape drive	optional external tape drive
SCSI devices	up to four 1-inch, internal, hot-pluggable Ultra3 SCSI hard-disk drives
CD-ROM drive	one IDE CD-ROM drive
Ports and Connectors	
Externally accessible:	
Serial (DTE)	two 9-pin connectors; 16550-compatible
Parallel	one 25-pin connector (bidirectional)
Video	one 15-pin connector
PS/2-style keyboard	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors
NIC	RJ45 connector for integrated NIC
SCSI	One 68-pin Ultra3 SCSI connector
ICMB	(Not supported)
Internally accessible:	
IDE channels	two 40-pin connectors
SCSI channels	two 68-pin Ultra3 SCSI connectors
Video	
Video type	ATI Rage 128 XL video controller; VGA connector
Video memory (standard)	8 MB
Power1	
DC power supply:	
Wattage	four 800 W power supplies in a 3 +1 redundant configuration
Voltage	200-240V, 50/60 Hz optional 100-240V, 50/60 Hz
System battery	CR2032 3.0-V lithium coin cell

Physical	
Height	31.12 cm (12.25 inches [7 U])
Width	44.45 cm (17.5 inches)
Depth	71.12 cm (28.0 inches)
Weight	72.5 kg (160 lb), maximum configuration
Environmental	
Temperature:	
Operating	10° to 35° C (50° to 95° F)
Storage	-40° to 65° C^2 (-40° to 149° F)
Relative humidity:	
Operating	85% (noncondensing at 40° C [104° F])
Storage	95% (noncondensing at 55° C [131° F])

NOTE: [1] Under typical line conditions and over the entire system ambient operating range, the inrush current may reach 140A.

NOTE: [2] Limit the number of transitions across 0° C to no more than 50.

NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.

I/O Ports and Connectors
Dell™ PowerEdge™ 7150 Systems User's Guide

- Serial and Parallel Ports
- Keyboard and Mouse Connectors
- Video Connector
- USB Connectors
- Integrated Network Interface Controller Connector

This section provides specific information about the computer's I/O ports.

The I/O ports and connectors on the back panel of the computer are the gateways through which the computer system communicates with external devices, such as a keyboard, mouse, printer, and monitor. Figure B-1 identifies the I/O ports and connectors for your system.

Figure B-1. Back-Panel Features
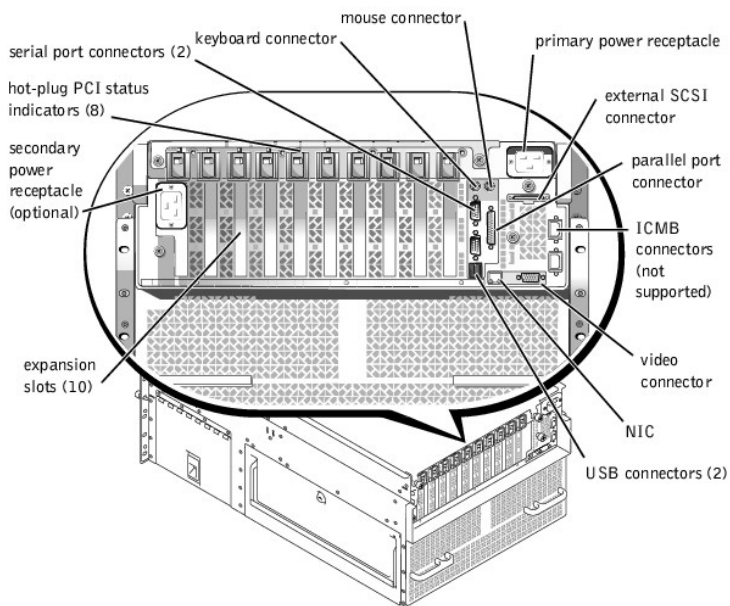
Serial and Parallel Ports

The two integrated serial ports use 9-pin D-subminiature connectors on the back panel. These ports support devices such as external modems, printers, plotters, and mice that require serial data transmission (the transmission of data one bit at a time over one line).

Most software uses the term COM (for communications) plus a number to designate a serial port (for example, COM1 or COM2). The default designations of your computer's integrated serial ports are COM1 and COM2.

The integrated parallel port uses a 25-pin D-subminiature connector on the computer's back panel. This I/O port sends data in parallel format (where eight data bits, or one byte, are sent simultaneously over eight separate lines in a single cable). The parallel port is used primarily for printers.

Most software uses the term LPT (for line printer) plus a number to designate a parallel port (for example, LPT1). The default designation of the computer's integrated parallel port is LPT1.

Port designations are used, for example, in software installation procedures that include a step in which you identify the port to which a printer is attached, thus telling the software where to send its output. (An incorrect designation prevents the printer from printing or causes scrambled print.)

Serial Port Connectors

If you reconfigure your hardware, you may need pin number and signal information for the serial port connectors. Figure B-2 illustrates the pin numbers for the serial port connectors and Table B-1 defines the pin assignments and interface signals for the serial port connector.

Figure B-2. Pin Numbers for the Serial Port Connectors

Table B-1. Pin Numbers for the Serial Port Connectors

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

Parallel Port Connector

If you reconfigure your hardware, you may need pin number and signal information for the parallel port connector. Figure B-3 illustrates the pin numbers for the parallel port connector and Table B-2 defines the pin assignments and interface signals for the parallel port connector.

Figure B-3. Pin Numbers for the Parallel Port Connector

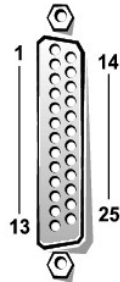**Table B-2. Parallel Port Pin Assignments**

Pin	Signal	I/O	Definition
1	STB#	I/O	Strobe
2	PD0	I/O	Printer data bit 0
3	PD1	I/O	Printer data bit 1
4	PD2	I/O	Printer data bit 2
5	PD3	I/O	Printer data bit 3
6	PD4	I/O	Printer data bit 4
7	PD5	I/O	Printer data bit 5

8	PD6	I/O	Printer data bit 6
9	PD7	I/O	Printer data bit 7
10	ACK#	I	Acknowledge
11	BUSY	I	Busy
12	PE	I	Paper end
13	SLCT	I	Select
14	AFD#	O	Automatic feed
15	ERR#	I	Error
16	INIT#	O	Initialize printer
17	SLIN#	O	Select in
18–25	GND	N/A	Signal ground

Keyboard and Mouse Connectors

The system uses a Personal System/2 (PS/2)-style keyboard and supports a
PS/2-compatible mouse. Cables from both devices attach to 6-pin, miniature *Deutsche Industrie Norm* (DIN) connectors on the back panel of your computer.

Mouse driver software can give the mouse priority with the microprocessor by issuing IRQ12 whenever a new mouse movement is detected. The driver software also passes along the mouse data to the application program that is in control.

Keyboard Connector

If you reconfigure your hardware, you may need pin number and signal information for the keyboard connector. illustrates the pin numbers for the keyboard connector and defines the pin assignments and interface signals for the keyboard connector.

Figure B-4. Pin Numbers for the Keyboard Connector

Table B-3. Keyboard Connector Pin Assignments

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

Mouse Connector

If you reconfigure your hardware, you may need pin number and signal information for the mouse connector. illustrates the pin numbers for the mouse connector, and defines the pin assignments and interface signals for the mouse connector.

Figure B-5. Pin Numbers for the Mouse Connector

Table B-4. Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	MCDATA	I/O	Mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	MCCLK	I/O	Mouse clock
6	NC	N/A	No connection
Shell	N/A	N/A	Chassis ground

Video Connector

The system uses a 15-pin high-density D-subminiature connector on the back panel for attaching a video graphics array (VGA)-compatible monitor to your computer. The video circuitry on the system board synchronizes the signals that drive the red, green, and blue electron guns in the monitor.

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

If you reconfigure your hardware, you may need pin number and signal information for the video connector. Figure B-6 illustrates the pin numbers for the video connector, and Table B-5 defines the pin assignments and interface signals for the video connector.

Figure B-6. Pin Numbers for the Video Connector
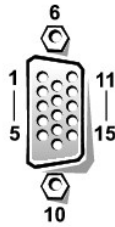
Table B-5. Video Connector Pin Assignments

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

USB Connectors

Your system contains two USB connectors for attaching USB-compliant devices. USB devices are typically peripherals such as mice, printers, keyboards, and computer speakers.

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

If you reconfigure your hardware, you may need pin number and signal information for the USB connectors. Figure B-7 illustrates the USB connector and Table B-6 defines the pin assignments and interface signals for the USB connector.

Figure B-7. Pin Numbers for the USB Connector

Table B-6. USB Connector Pin Assignments

Pin	Signal	I/O	Definition
1	Vcc	N/A	Supply voltage
2	-DATA	I/O	Differential data
3	+DATA	I/O	Differential data
4	GND	N/A	Signal ground
Shell	N/A	N/A	Chassis ground

Integrated Network Interface Controller Connector

Your system has an integrated 10/100–Mbps NIC. The NIC provides all the functions of a separate network expansion card and supports both the 10BASE-T and 100BASE-TX Ethernet standards.

Figure B-8. NIC Connector

link indicator   activity indicator

The NIC includes a Wake On LAN (WOL) feature that enables the computer to be started by a special LAN signal from a server management console. WOL provides remote computer setup, software downloading and installation, file updates, and asset tracking after hours and on weekends when LAN traffic is typically at a minimum.

Network Cable Requirements

Your computer's RJ45 NIC connector is designed for attaching an unshielded twisted pair (UTP) Ethernet cable equipped with standard RJ45-compatible plugs. Press one end of the UTP cable into the NIC connector until the plug snaps securely into place. Connect the other end of the cable to an RJ45 jack wall plate or to an RJ45 port on a UTP concentrator or hub, depending on your network configuration. Observe the following cabling restrictions for 10BASE-T and 100BASE-TX networks.

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

- For 10BASE-T networks, use Category 3 or greater wiring and connectors.

- For 100BASE-TX networks, use Category 5 or greater wiring and connectors.

- The maximum cable run length (from a workstation to a concentrator) is 328 ft(100 m).

- For 10BASE-T networks, the maximum number of daisy-chained concentrators on one network segment is four.

System Overview
Dell™ PowerEdge™ 7150 Systems User's Guide

The Dell™ PowerEdge™ 7150 system is a feature-rich, enterprise-class server that offers the highest performance, availability, scalability, manageability, and investment protection features. This system provides a robust, reliable, rack-optimized platform on which corporate customers can deploy their mission-critical applications.

This section describes the major hardware and software features of the computer system, provides information about the indicators on the system's bezel and control panel, and discusses connecting external devices to the system. It also provides information on obtaining assistance from Dell.

Computer Orientation

When following the procedures in this guide, assume that the locations or directions relative to the computer are as shown in Figure 1-1.

Figure 1-1. Computer Orientation (top view)
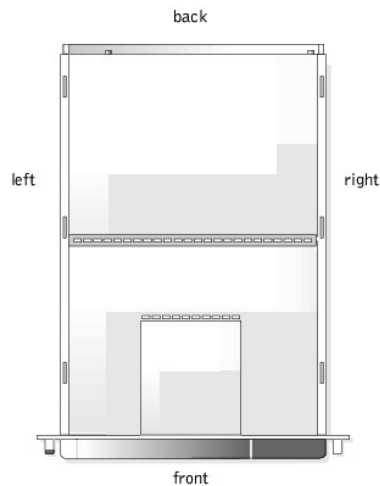
Removing and Replacing the Bezel

Removing the front bezel provides access to the power switch, diskette drive, control panel, CD-ROM drive, power supplies, and hard-disk drive(s).

Removing the Bezel

Pull the bezel away from the computer until it disengages from the four posts on the chassis (see Figure 1-2).

Figure 1-2. Removing the Bezel

posts (4)
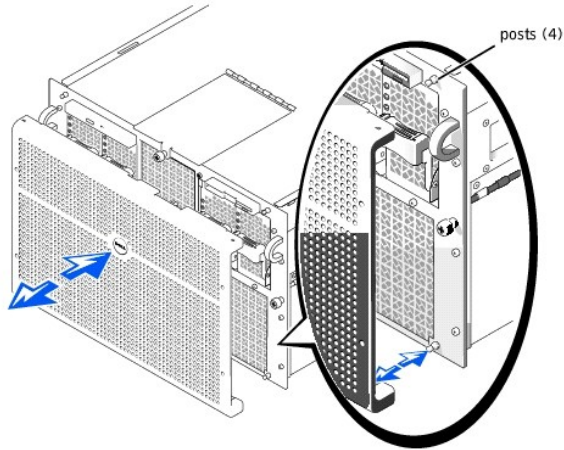
Replacing the Bezel

⚠️ **CAUTION: When reinstalling the front bezel, carefully align the bezel to avoid damaging the connector on the back which operates the indicator lights on the front of the bezel.**

1. Align the four notches and the connector on the back of the bezel with the four posts and connector on the front of the system.

2. Gently press the bezel onto the front of the computer until it snaps into place.

Front-Panel Features

shows the major features at the front of the computer.

Figure 1-3. Front-Panel Features

CD-ROM drive
power supplies (4)
control panel indicators
hard-disk drives (4)
hard-disk drive media bay
diskette drive
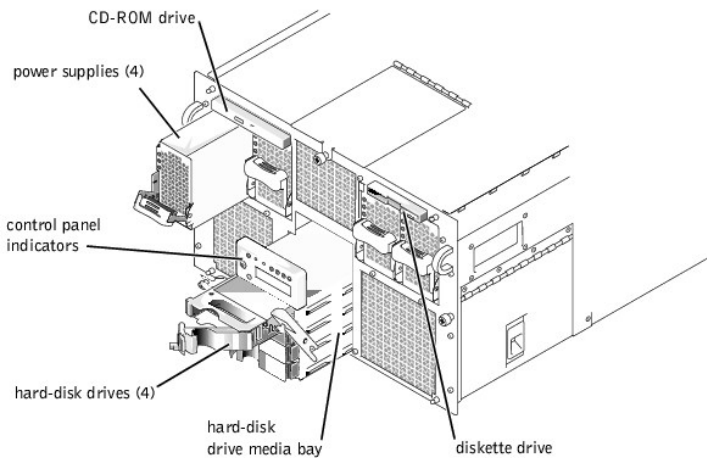
Bezel and Control Panel Indicators

The system bezel and control panel both have indicators to provide you with information on the system's status.

Bezel Indicators

When the bezel is in place on the system, it has two indicators (see). The Dell logo lights blue when the system is operating correctly. The caution icon lights amber when the system needs attention. The amber caution light indicates a power problem, a fan/temperature problem, a hard drive problem, or that the PCI expansion cards need attention. Remove the bezel to determine the source of the problem.

Figure 1-4. Bezel Indicators
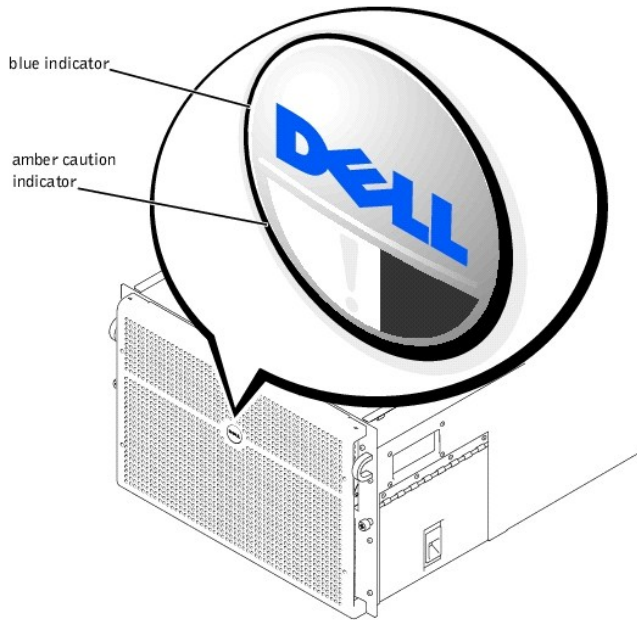
Control-Panel Indicators

The indicators on the computer's control panel described in Table 1-1 are shown in Figure 1-5:

Table 1-1. Control-Panel Indicators

Indicator	Function
Power	Green when the power supplies are turned on and the system is receiving power
Power-Supply Status	Amber if a fault is detected with any of the power supplies, any system voltages, or redundant AC power line failure
Fan Status	Amber when a fan failure is detected or temperature is out of bounds
PCI Slot Attention	Amber when one or more or the PCI slots need attention.
Hard-disk drive fault	Amber if a problem occurs with one of the internal hard-disk drives
Display	System information messages during POST

Figure 1-5. Control-Panel Indicators
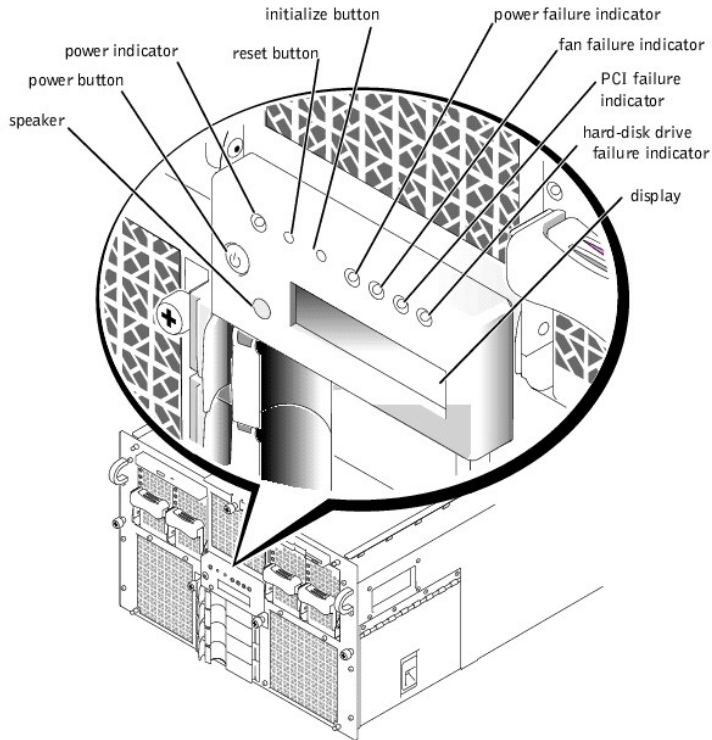
Back-Panel Features

shows the back-panel features on the computer.

Figure 1-6. Back-Panel Features
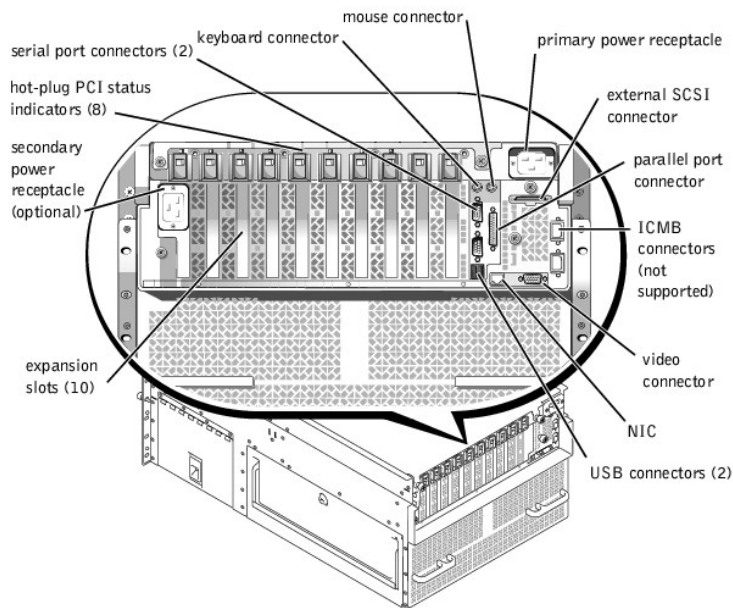
When connecting external devices to your system, follow these guidelines:

- l Always attach external devices while your system is turned off and the AC power cords are unplugged. Turn on any external devices before turning on the

system unless the documentation for the device specifies otherwise. (If the system does not seem to recognize the device, try turning on the system before turning on the device.)

l   Check the documentation that accompanied the device for specific installation and configuration instructions. For example, most devices must be connected to a particular connector to operate properly. Also, external devices usually require you to install device drivers before they will work. Device drivers are normally included with your operating system software, or with the device itself.

For information about enabling, disabling, or configuring I/O ports and connectors, see "Using the System Setup Program" or "I/O Ports and Connectors."

System Features

Your PowerEdge system offers the following features:

l   One to four Intel$^®$ Itanium$^™$ microprocessors.

l   Front-side bus speed of 133 MHz (266 MHz double-pumped).

l   Level 3 cache of 2 or 4 MB.

l   Support for symmetric multiprocessing (SMP), which is available by installing up to three additional microprocessors.

> **NOTE:** If you decide to upgrade your system by installing additional microprocessors, you must order the microprocessor upgrade kits from Dell. Not all versions of the microprocessor will work properly as additional microprocessors. The upgrade kit from Dell contains the correct version of the microprocessor as well as the correct instructions for performing the upgrade. All microprocessors must have the same internal operating frequency and cache size.

l   A minimum of 1 GB of system memory, upgradable to a maximum of 64 GB by installing combinations of 128-, 256-, or 512-MB or 1-GB (when available) registered SDRAM memory modules in the 32 sockets on each of the two memory boards. The system supports 4-way interleaving if specific memory configurations are used.

l   Support for up to four 1-inch, internal, hot-pluggable Ultra SCSI hard-disk drives via a 1 x 4 or 2 x 2 SCSI backplane board and hard-disk drive carriers.

l   Four hot-pluggable, 800 W power supplies in a 3 + 1 redundant configuration.

l   An optional redundant 208-V power module.

l   Six redundant, hot-pluggable system cooling fans.

The system's I/O board includes the following built-in features:

l   Ten 64-bit, PCI expansion-card connectors on seven PCI buses. Eight of the expansion slots operate at 66 or 33 MHz and are hot-pluggable. These expansion slots accommodate 3.3V or Universal (3.3 or 5V) expansion cards. The two remaining expansion slots operate at 33 MHz and are not hot-pluggable. You can install 5V or Universal PCI cards in these two expansion slots. (An eleventh expansion slot is reserved for use by the system's I/O riser board.)

l   A video subsystem based on the ATI Rage 128 XL video controller. This video subsystem resides on the 33 MHz PCI bus and contains 8 MB of video memory (not upgradable). Maximum resolutions are 1280 x 1024 with 256 colors noninterlaced. In 800 x 600 and 640 x 480 resolutions, 16.7 million colors are available for true-color graphics.

l   Ultra3 SCSI device support via an integrated QLogic ISP12160A dual-channel controller.

l   An integrated Intel 10/100 NIC, which provides an external Ethernet interface.

l   Server management circuitry that monitors the operation of the system fans as well as critical system voltages and temperatures.

Standard systems include an IDE CD-ROM drive and a diskette drive installed in the externally accessible bays.

The following software is included with your Dell system:

l   A system setup program for quickly viewing and changing the system configuration information for your system. For more information on this program, see "Using the System Setup Program"

l   An Extensible Firmware Interface (EFI) Boot Manager program which lets you access the EFI Shell command line prompt, a boot manager utility, and the **Dell Utilities**.

l   Enhanced security features, including chassis intrusion monitoring and a user password and a supervisor password, available through the system setup program.

l   Dell Diagnostics for evaluating your system's components and devices. For information on using the system diagnostics, see "Running the Dell Diagnostics" in your *Installation and Troubleshooting Guide*.

Power Protection Devices

A number of devices are available that protect against potential power problems such as power surges, transients, and power failures. The following subsections describe some of these devices.

Surge Protectors

Surge protectors are available in a variety of types and usually provide a level of protection commensurate with the cost of the device. Surge protectors prevent voltage spikes, such as those caused during an electrical storm, from entering a system through the electrical outlet. Surge protectors, however, do not offer protection against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

Line Conditioners

Line conditioners go beyond the overvoltage protection of surge protectors. Line conditioners keep a system's AC power source voltage at a fairly constant level and, therefore, can handle brownouts. Because of this added protection, line conditioners cost more than surge protectors—up to several hundred dollars. However, these devices cannot protect against a complete loss of power.

Uninterruptible Power Supplies

UPS systems offer the most complete protection against variations in power because they use battery power to keep the system running when AC power is lost. The battery is charged by the AC power while it is available, so once AC power is lost, the battery can provide power to the system for a limited amount of time—from 15 minutes to an hour or so—depending on the UPS system.

UPS systems range in price from a few hundred dollars to several thousand dollars, with the more expensive units allowing you to run larger systems for a longer period of time when AC power is lost. UPS systems that provide only 5 minutes of battery power let you conduct an orderly shutdown of the system, but are not intended to provide continued operation. Surge protectors should be used with all UPS systems, and the UPS system should be UL safety-approved.

Other Documents You May Need

Besides this *User's Guide*, the following documentation is included with your system:

- The *Setting Up Your System* sheet provides general instructions for setting up your computer system.

- *Dell PowerEdge 7150 Systems Installation and Troubleshooting Guide*

- *Dell PowerEdge System Information* document for important safety, regulatory, and warranty information

- *Dell PowerEdge 7150 Systems Rack Installation Guide*

You might also have one or more of the following documents:

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

- Operating system documentation is included if you ordered your operating system software from Dell. This documentation describes how to install (if necessary), configure, and use your operating system software.

- Documentation is included with any options you purchase separately from your system. This documentation includes information that you need to install and configure these options in your Dell system. Installation instructions for the options are included in this *User's Guide*.

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

Safety, Regulatory, and Warranty Information

For safety, regulatory, and warranty information for your system, see the *System Information* document included with your system.

Getting Help

If at any time you don't understand a procedure described in this guide or if your system does not perform as expected, Dell provides a number of tools to help you. For more information on these help tools, see "Getting Help" in your *Installation and Troubleshooting Guide*.

Back to Contents Page

Using the EFI Boot Manager and Dell Utilities

Dell™ PowerEdge™ 7150 Systems User's Guide

- EFI Boot Manager
- Dell Utilities
- PowerEdge 7150 System Support CD
- Updating or Restoring the System BIOS

This section describes your system's Extensible Firmware Interface (EFI) Boot Manager program, the *PowerEdge 7150 System Support CD*, and the Dell Utilities program. They provide access to various utilities which you may use to configure your system.

EFI Boot Manager

The EFI Boot Manager menu lets you access the operating systems installed on your system, a boot manager utility, and the **Utilities** menu.

Entering the EFI Boot Manager

1. Turn on your system by pressing the power button on the system front panel.

   If your system is already on, reboot it.

2. Wait until the system tests are completed.

   The **EFI Boot Manager** screen appears.

Selecting EFI Boot Manager Options

From the **EFI Boot Manager** screen, you can select the following options:

- Operating systems installed on your system

- **Boot Option Maintenance Manager** Menu — Use this option to select which devices the system can be booted from, and their relative order.

- **Utilities** — Select this option to go to the **Utilities Option Menu**. For more information on this menu, see "Utilities Option Menu."

Utilities Option Menu

This menu includes the following options:

- **EFI Shell** — Use this option to run command-driven programs from the **Shell** prompt.

- Dell Utilities — Select this option to run the Dell Utilities program. See "Dell Utilities" for more information on this program.

- BIOS Update — Select this option to update the system BIOS to the latest version. See "Updating or Restoring the System BIOS" for more information on this program.

- Firmware Update — Select this option to update the system firmware to the latest version.

- Run Dell Diagnostics from diskette — Select this option to run the system hardware diagnostics. (For more information, see "Running the Dell Diagnostics" in your *Installation and Troubleshooting Guide*.)

Dell Utilities

The *Dell Utilities* include the Dell Diagnostics program, as well as features that can help you configure your system to best meet your needs. You run the utilities from an EFI System Partition that you can create on the system boot hard-disk drive, using the *PowerEdge 7150 System Support CD*. (See "PowerEdge 7150 System Support CD" for more information on this CD.)

Starting the Dell Utilities

If you have created an EFI System Partition on the system's boot hard-disk drive and installed the utilities on this partition, you can run the Dell Utilities. To run the Dell Utilities from the hard-disk drive, perform the following steps:

1. Turn on your system by pressing the power button on the system front panel.

If your system is already on, reboot it.

2. Wait until the system tests are completed.

    The **EFI Boot Manager** screen appears.

3. From the **EFI Boot Manager** main menu, select **Utilities**.

4. From the **Utilities Options** menu, select **Dell Utilities**.

Selecting Dell Utilities Options

From the Dell Utilities menu, you can select options to perform the following tasks:

l   Run the Dell Diagnostics program (The system hardware diagnostics are described in "Running the Dell Diagnostics" in your *Installation and Troubleshooting Guide*.)

l   Assign or change an asset tag number for your system. An asset tag number can have up to ten characters; any combination of characters, excluding spaces, is valid.

l   Run the System Event Log (SEL) Viewer

PowerEdge 7150 System Support CD

To access the utilities, drivers, and other items available on the *PowerEdge 7150 System Support CD*, insert the CD into the system's CD-ROM drive, and turn on or reboot the system.

NOTE: If the CD does not boot, verify that the CD-ROM drive is specified in the boot sequence option in the EFI Boot Maintenance Manager program.

PowerEdge 7150 System Support CD Options

From the main menu, you can select options to perform the following tasks:

l   Create an EFI System Partition on the boot hard-disk drive

l   Copy the Dell Utilities to the EFI System Partition

l   Copy drivers or system utilities to a diskette

l   Run the Dell Diagnostics program (The system hardware diagnostics are described in "Running the Dell Diagnostics" in your *Installation and Troubleshooting Guide*.)

Updating or Restoring the System BIOS

If necessary, you can restore the system BIOS or update the system BIOS to the latest version.

1. Before updating the BIOS, run the system setup program and note any option settings that vary from the default settings.

2. Download the updated BIOS files from **http://support.dell.com** onto the BIOS recovery diskette provided with your system.

3. Insert the BIOS recovery diskette into the diskette drive and reboot the system.

4. From the **EFI Boot Manager** menu, select the **Utilities** option.

5. Select the **BIOS Update** option and follow the on-screen instructions.

    The system reboots automatically after the update process is completed.

6. Enter the system setup program by pressing <F2> when the Dell logo is displayed, and restore the options to their original settings.

Using the System Setup Program
Dell™ PowerEdge™ 7150 Systems User's Guide

- Entering the System Setup Program
- System Setup Screens
- Using the Password Features
- Disabling a Forgotten Password

You can use the system setup program as follows:

- To change the system configuration information after you add, change, or remove hardware in your system

- To set or change user-selectable options—for example, the time or date on your system

- To configure integrated devices in your system

After you set up your system, run the system setup program to familiarize yourself with your system configuration information and optional settings. Dell recommends that you record this information for future reference.

Entering the System Setup Program

1. Turn on your system by pressing the power button on the system front panel.

   If your system is already on, shut it down and then turn it on again.

2. Press <F2> immediately after the Dell logo is displayed.

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

   NOTE: To ensure an orderly system shutdown, consult the documentation that accompanied your operating system.

   You can also enter the system setup program by responding to certain error messages. See "Responding to Error Messages."

Responding to Error Messages

If an error message appears on your monitor screen while the system is booting, make a note of the message. Then, before entering the system setup program, see "System Beep Codes" and "System Messages" in your *Installation and Troubleshooting Guide* for an explanation of the message and suggestions for correcting any errors. (An exception to this routine: It is normal to receive an error message the first time you boot your system after installing a memory upgrade. In that situation, do not refer to "System Beep Codes" and "System Messages." Instead, follow the instructions for performing a memory upgrade in "Adding Memory" in your *Installation and Troubleshooting Guide*.)

If you are given an option of pressing either <F1> to continue or <F2> to run the system setup program, press <F2>.

Using the System Setup Program

Table 3-1 lists the keys that you use to view or change information on the system setup screens and to exit the program.

.

Table 3-1. System Setup Navigation Keys

Keys	Action
Left and Right Arrows	Scrolls through the five main menu screens
<Enter>	Selects a menu option
Up and Down arrows	Scrolls through menu items or options in a field
<Esc>	Exits the system setup program without changing values
<F9>	Restores default values for all system setup program fields
<F10>	Saves changes and exits the system setup program
<Tab>	Used to to select a field within the date and time options

---

System Setup Screens

The system setup screens display the current setup and configuration information for your system. You can select the following five primary screens:

- **Main** — displays the BIOS version, microprocessor type, and default system setup screen language. You can also set the system time and date and processor retest option from this screen.

- **Advanced** — displays a screen with five submenu items (**Boot Configuration**, **Peripheral Configuration**, **IDE Configuration**, **Chipset Configuration,** and **Event Log Configuration**). See "Advanced Menu Screen" for information on these submenus.

- **Security** — displays a screen which allows you to configure the user password and supervisor password features. See "Using the Password Features" and "Using the Supervisor Password Feature."

- **Boot** — displays the **Boot** screen which allows you to specify the boot order of devices in the system. See "Boot Screen" for more information on these options.

- **System Management** — displays a screen with two submenu items (**Console Redirection** and **Server Boot**).

- **Exit** — displays the **Exit** screen. See "Exit Screen."

Main Menu Screen

The **Main Menu** screen displays the BIOS version, microprocessor, and default BIOS language. You can also set the system time and date from this screen.

Advanced Menu Screen

You can select from the following five submenus from the **Advanced Menu** screen described in the subsections that follow.

Boot Configuration Submenu

The **Boot Configuration** submenu options configure several boot settings, including the presence of a Plug and Play operating system and the status of the keyboard keypad. (To change the system startup boot order, use the **Boot** screen, described later in this section.)

Peripheral Configuration Submenu

You can use this submenu to configure the following devices:

- **Serial Port A, Serial Port B** — Configures the system's integrated serial ports. These options can be set to **Auto** (the default) to automatically configure a port, to **Enable** to select a particular address and interrupt value, or to **Disable**.

- **Serial Port Mode** — Configures the transfer mode for the system's integrated serial ports. To determine the correct mode to use, see the documentation that came with the peripheral device connected to the serial ports.

- **Parallel Port**— Configures the system's integrated parallel port.

- **Parallel Port Mode** — Configures the transfer mode for the system's integrated parallel port. To determine the correct mode to use, see the documentation that came with the peripheral device connected to the parallel port.

- **Onboard SCSI** — Enables the system's integrated SCSI controller.

- **Onboard NIC** — Enables the system's integrated NIC.

IDE Configuration Submenu

Use this submenu to configure the system's integrated IDE controller and any IDE devices in the system, such as the diskette drive or CD-ROM drive.

Chipset Configuration Submenu

To avoid possible system degradation, do not change the settings in this menu's options from their default values.

Event Log Configuration

Use this submenu to enable or disable system event logging, view the event log, mark events as read, or clear event log entries.

Security Screen

This screen displays the current status of the supervisor password and the user password. The *user password* protects against unauthorized access to your system; the *supervisor password* protects against unauthorized changes to the system setup program.

If the supervisor password is not enabled, you can set these two passwords using the **Set Supervisor Password** and **Set User Password** options.

NOTE: See the section "Using the Password Features" for instructions on assigning a password and using or changing an existing password. See the section, "Disabling a Forgotten Password" for instructions on disabling a forgotten password.

The Security Screen also allows you to enable and configure the Secure Mode option. When the system is in Secure Mode, most input and output devices are disabled until you enter the user password. You can modify the Security Screen settings to activate Secure Mode after a period of inactivity, at system boot, after a period of system inactivity, or by pressing a key sequence that you define using a Security Screen option.

Boot Screen

The Boot Screen options determine the boot search order for devices connected to the system. Available options include the diskette drive, hard-disk drives, CD-ROM drive, and removable devices. This screen also allows you to bypass certain system tests during system startup, and select the relative order of the primary and secondary IDE devices.

System Management Screen

You can select the **Console Redirection** submenu from the **System Management** screen. Use this submenu to enable and configure an I/O port to support console redirection.

Exit Screen

After you press <Esc> to exit the system setup program, the **Exit** screen displays the following choices:

l **Exit Saving Changes** — Use this option if you wish to implement changes made to the system setup options.

l **Exit Discarding Changes** — Use this option to return the system setup options to their previous settings.

l **Load Setup Defaults** — This option allows you to return all system setup options to their original default settings.

l **Save Customer Defaults** — This option lets you save the current system setup option values in a file to preserve a particular system configuration.

l **Load Custom Defaults** — This option loads a set of option settings previously saved using the **Save Customer Defaults** option.

l **Discard Changes** — This option allows you to return the system setup options to their previous settings, without exiting the system setup program.

Using the Password Features

Your Dell system is shipped to you without the password features enabled. If system security is a concern, you should operate your system only with password protection. The *user password* protects against unauthorized access to your system; the supervisor password protects against unauthorized changes to the system setup program.

NOTICE: If you leave your system running and unattended without having a user password assigned, or if you leave your computer chassis unlocked so that someone can disable the password by changing a jumper setting on the I/O riser board, anyone can access the data stored on the system hard-disk drives.

Assigning a User Password

When no user password is assigned and the password jumper on the I/O riser board is in the enabled position (its default), the setting shown for the **User Password** option is **Not Installed**.

From the **Security** screen, highlight the **Set User Password** category and press <Enter> to display a dialog box in which you can enter a user password. Keep the following tips in mind when setting your password:

l You can use up to seven alphanumeric characters in your password (passwords are not case sensitive).

l As you press each character key (or the Spacebar for a blank space), a placeholder appears in the field.

l To erase a character when entering your password, press <Backspace>.

l To escape from the field without assigning a user password, press <Esc>.

l Password protection does not take effect until you reboot the system by turning the system off and then on again.

Deleting or Changing an Existing User Password

To delete the user password, enter the system setup program, select Set User Password from the Security Menu, and press <Enter> to display the Set Password dialog box. Enter the current user password, press <Enter>, leave the password field blank, then press <Enter> again.

To change an existing user password, enter the system setup program, select the Set User Password category from the Security screen, and enter the current user password. Then assign a new password as described in "Assigning a User Password."

Using the Supervisor Password Feature

When the supervisor password is enabled, the system prompts you for the supervisor password whenever you enter the system setup program. If system configuration security is a concern, you should operate your system with supervisor password protection.

Once the supervisor password is assigned, only those who know the password have full use of the system setup program, including the **Security** screen. Consequently, to delete or change an existing user password, you must know the supervisor password (see "Deleting or Changing an Existing Supervisor Password").

If you assign and then forget a supervisor password, a trained service technician must open the computer and change a jumper setting to disable the supervisor password feature (see "Disabling a Forgotten Password"). Note that the user password is also erased at the same time.

Assigning a Supervisor Password

From the **Security** screen, highlight the **Set Supervisor Password** category and press <Enter> to display a dialog box in which you can enter a user password. Keep the following tips in mind when setting your password:

- You can use up to seven alphanumeric characters in your password (passwords are not case sensitive).

- As you press each character key (or the Spacebar for a blank space), a placeholder appears in the field.

- To erase a character when entering your password, press <Backspace>.

NOTE: The supervisor password can be the same as the user password.

NOTE: If the two passwords are different, the supervisor password can be used as an alternate user password. However, the user password cannot be used in place of the supervisor password.

A change to the **Supervisor Password** option becomes effective immediately (rebooting the system is not required).

Deleting or Changing an Existing Supervisor Password

To delete the supervisor password, enter the system setup program, select **Set Supervisor Password** from the Security Menu, and press <Enter> to display the **Set Password** dialog box. Enter the current user password, press <Enter>, leave the password field blank, then press <Enter> again.

To change an existing supervisor password, enter the system setup program, select the **Set Supervisor Password** category from the **Security** screen, and enter the current supervisor password. Then assign a new password as described in "Assigning a Supervisor Password."

Disabling a Forgotten Password

If you forget your user or supervisor password, you cannot operate your system or change settings in the system setup program until a trained service technician opens the computer chassis, changes the password jumper setting to disable the passwords, and erases the existing passwords. This procedure is described in Appendix A of the *Installation and Troubleshooting Guide.*

Back to Contents Page

Glossary

Dell™ PowerEdge™ 7150 Systems User's Guide

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

A

Abbreviation for ampere(s).

AC

Abbreviation for alternating current.

adapter card

An expansion card that plugs into an expansion-card connector on the system's system board. An adapter card adds some specialized function to the system by providing an interface between the expansion bus and a peripheral device. Examples of adapter cards include network cards, sound boards, and SCSI adapters.

application program

Software designed to help you perform a specific task, such as a spreadsheet or word processor. Application programs are distinct from operating system and utility software.

backup

A copy of a program or data file. As a precaution, you should back up your system's hard-disk drive on a regular basis. Before making a change to the configuration of your system, you should back up important start-up files.

beep code

A diagnostic system message in the form of a series of beeps from your system's speaker. See your *Installation and Troubleshooting Guide* for a complete discussion of system beep codes.

BIOS

Acronym for basic input/output system. Your system's BIOS contains programs stored on a ROM chip. The BIOS controls the following functions:

  l Communications between the micro-processor and peripheral devices such as the keyboard and the video adapter

  l Miscellaneous functions, such as system messages

bit

The smallest unit of information interpreted by your system.

boot routine

When you start your system, it clears all memory, initializes devices, and loads the operating system. Unless the operating system fails to respond, you can reboot (also called warm boot) your system by pressing <Ctrl><Alt><Del>; otherwise, you must perform a cold boot by pressing the reset button (if your system has one) or by turning the system off and then back on.

bootable diskette

You can start your system from a diskette in drive A. To make a bootable diskette, insert a diskette in drive A, type sys a: at the command line prompt and then press <Enter>. Use this bootable diskette if your system will not boot from the hard-disk drive.

bps

Abbreviation for bits per second.

BTU

Abbreviation for British thermal unit.

bus

A bus forms an information pathway between the components of a system. Your system contains an expansion bus that allows the microprocessor to communicate with controllers for all the various peripheral devices connected to the system. Your system also contains an address bus and a data bus for communications between the micro-processor and RAM.

byte

Eight contiguous bits of information; the basic data unit used by your system.

C

Abbreviation for Celsius.

cache

To facilitate quicker data retrieval, a storage area for keeping a copy of data or instructions. For example, your system's BIOS may cache ROM code in faster RAM. Or a disk-cache utility may reserve RAM in which to store frequently accessed information from your system's disk drives; when a program makes a request to a disk drive for data that is in the cache, the disk-cache utility can retrieve the data from RAM faster than from the disk drive.

card-edge connector

On the bottom of an expansion card, the metal-contact section that plugs into an expansion-card connector.

CD-ROM

Abbreviation for compact disc read-only memory. CD-ROM drives use optical technology to read data from compact discs. CDs are read-only storage devices; you cannot write new data to a CD with standard CD-ROM drives.

CGA

Abbreviation for color graphics adapter.

cm

Abbreviation for centimeter(s).

controller

A chip or expansion card that controls the transfer of data between the micro-processor and a peripheral such as a diskette drive or the keyboard.

coprocessor

A coprocessor relieves the system's microprocessor of specific processing tasks. A math coprocessor, for example, handles numeric processing. A graphics coprocessor handles video rendering. The Intel Pentium microprocessor includes an integrated math coprocessor.

cpi

Abbreviation for characters per inch.

CPU

Abbreviation for central processing unit. See also microprocessor.

dB

Abbreviation for decibel(s).

dBA

Abbreviation for adjusted decibel(s).

DC

Abbreviation for direct current.

device driver

A device driver allows the operating system or a program to interface correctly with a peripheral such as a printer or network card. Some device drivers—such as network drivers—must be loaded from the **config.sys** file (with a device= statement) or as memory-resident programs (usually, from the **autoexec.bat** file). Others—such as video drivers—must load when you start the program for which they were designed.

DHCP

Acronym for Dynamic Host Configuration Protocol.

diagnostics

See diskette-based diagnostics.

DIMM

Acronym for dual in-line memory module.

DIN

Acronym for Deutsche Industrie Norm.

display adapter

See video adapter.

DMA

Abbreviation for direct memory access. A DMA channel allows certain types of data transfer between RAM and a device to bypass the microprocessor.

DRAC

Acronym for Dell OpenManage Remote Assistant Card.

DRAM

Abbreviation for dynamic random-access memory. A system's RAM is usually made up entirely of DRAM chips. Because DRAM chips cannot store an electrical charge indefinitely, your system continually refreshes each DRAM chip in the system.

drive-type number

Your system can recognize a number of specific hard-disk drives. Each is assigned a drive-type number that is stored in NVRAM. The hard-disk drive(s) specified in your system's System Setup program must match the actual drive(s) installed in the system. The System Setup program also allows you to specify physical parameters (cylinders, heads, write precomp, landing zone, and capacity) for drives not included in the table of drive types stored in NVRAM.

EMI

Abbreviation for electromagnetic interference.

expanded memory

A technique for accessing RAM above 1 MB. To enable expanded memory on your system, you must use an EMM. You should configure your system to support expanded memory only if you run application programs that can use (or require) expanded memory. See also conventional memory, EMM, extended memory, and memory manager.

expansion bus

Your system contains an expansion bus that allows the microprocessor to communicate with controllers for peripheral devices, such as a network card or an internal modem.

expansion-card connector

A connector on the system's system board for plugging in an expansion card.

extended memory

RAM above 1 MB. Most software that can use it, such as Windows, requires that extended memory be under the control of an XMM. See also conventional memory, expanded memory, memory manager, and XMM.

external cache memory

A RAM cache using SRAM chips. Because SRAM chips operate at several times the speed of DRAM chips, the microprocessor can retrieve data and instructions faster from external cache memory than from RAM.

flash memory

A type of EEPROM chip that can be reprogrammed from a utility on diskette while still installed in a system; most EEPROM chips can only be rewritten with special programming equipment.

format

To prepare a hard-disk drive or diskette for storing files. An unconditional format deletes all data stored on the disk. The format command in MS-DOS 5.0 or higher includes an option that allows you to unformat a disk if you have not yet used the disk for file storage.

ft

Abbreviation for foot/feet.

FTP

Abbreviation for file transfer protocol.

g

Abbreviation for gram(s).

G

Abbreviation for gravities.

GB

Abbreviation for gigabyte(s). A gigabyte equals 1024 megabytes or 1,073,741,824 bytes.

graphics coprocessor

See coprocessor.

graphics mode

See video mode.

GUI

Acronym for graphical user interface.

h

Abbreviation for hexadecimal. A base-16 numbering system, often used in programming to identify addresses in the system's RAM and I/O memory addresses for devices. The sequence of decimal numbers from 0 through 16, for example, is expressed in hexadecimal notation as: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, 10. In text, hexadecimal numbers are often followed by h or preceded by 0x. MS-DOS conventional memory—the first 640 KB of memory addresses—is from 00000h to 9FFFFh; the MS-DOS upper memory area—memory addresses between 640 KB and 1 MB—is from A0000h to FFFFFh.

heat sink

A metal plate with metal pegs or ribs that help dissipate heat. Some microprocessors include a heat sink.

See also conventional memory, memory manager, upper memory area, and XMM.

host adapter

A host adapter implements communication between the system's bus and the controller for a peripheral. (Hard-disk drive controller subsystems include integrated host adapter circuitry.) To add a SCSI expansion bus to your system, you must install the appropriate host adapter.

ICMB

Abbreviation for inter-chassis management bus.

I/O

Abbreviation for input/output. The keyboard and a printer, for example, are I/O devices. In general, I/O activity can be differentiated from computational activity. For example, when a program sends a document to the printer, it is engaging in I/O activity; when the program sorts a list of terms, it is engaging in computational activity.

ID

Abbreviation for identification.

IDE

Integrated drive electronics.

interlacing

A technique for increasing video resolution by only updating alternate horizontal lines on the screen. Because interlacing can result in noticeable screen flicker, most users prefer noninterlaced video adapter resolutions.

internal microprocessor cache

An instruction and data cache built into the microprocessor. The Pentium microprocessor, for example, includes a 16-KB internal cache, which is set up as an 8-KB read-only instruction cache and an 8-KB read/write data cache.

IP

Acronym for Internet Protocol.

IRQ

Abbreviation for interrupt request. A signal that data is about to be sent to or received by a peripheral travels by an IRQ line to the microprocessor. Each peripheral

connection must be assigned an IRQ number. For example, the first serial port in your system (COM1) is assigned to IRQ4 by default. Two devices can share the same IRQ assignment, but you cannot operate both devices simultaneously.

K

Abbreviation for kilo-, indicating 1000.

KB

Abbreviation for kilobyte(s), 1024 bytes.

KB/sec

Abbreviation for kilobyte(s) per second.

Kbit(s)

Abbreviation for kilobit(s), 1024 bits.

Kbps

Abbreviation for kilobit(s) per second.

key combination

A command requiring that you press multiple keys at the same time. For example, you can reboot your system by pressing the <Ctrl><Alt><Del> key combination.

kg

Abbreviation for kilogram(s), 1000 grams.

kHz

Abbreviation for kilohertz, 1000 hertz.

LAN

Acronym for local area network. A LAN system is usually confined to the same building or a few nearby buildings, with all equipment linked by wiring dedicated specifically to the LAN.

lb

Abbreviation for pound(s).

LED

Abbreviation for light-emitting diode. An electronic device that lights up when a current is passed through it.

LIF

Acronym for low insertion force. Some systems use LIF sockets and connectors to allow devices such as the microprocessor chip to be installed or removed with minimal stress to the device.

local bus

On a system with local-bus expansion capability, certain peripheral devices (such as the video adapter circuitry) can be designed to run much faster than they would with a traditional expansion bus. Some local-bus designs allow peripherals to run at the same speed and with the same-width data path as the system's microprocessor.

LPTn

The MS-DOS device names for the first through third parallel printer ports on your system are LPT1, LPT2, and LPT3.

LUN

Acronym for logical unit number.

m

Abbreviation for meter(s).

mA

Abbreviation for milliampere(s).

mAh

Abbreviation for milliampere-hour(s).

math coprocessor

See coprocessor.

MB

Abbreviation for megabyte(s). The term megabyte means 1,048,576 bytes; however, when referring to hard-disk drive storage, the term is often rounded to mean 1,000,000 bytes.

memory

A system can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM; for example, an unqualified statement such as "a system with 8 MB of memory" refers to a system with 8 MB of RAM.

memory address

A specific location, usually expressed as a hexadecimal number, in the system's RAM.

memory manager

A utility that controls the implementation of memory in addition to conventional memory, such as extended or expanded memory. See also conventional memory, EMM, expanded memory, extended memory, HMA, upper memory area, and XMM.

MHz

Abbreviation for megahertz.

microprocessor

Because it is the primary computational chip inside the system, it is customary to refer to the microprocessor as "the system's brain." The microprocessor contains an arithmetic processing unit and a control unit. Software written for one microprocessor must usually be revised to run on another microprocessor. CPU is a synonym for microprocessor.

min

Abbreviation for minute(s).

mirroring

A type of data redundancy that uses a set of physical drives to store data and one or more sets of additional drives to store duplicate copies of the data. Mirroring is the preferred data redundancy technique in lower-capacity systems and in systems where performance is extremely important. See also guarding, RAID 1, and RAID 10.

mm

Abbreviation for millimeter(s).

mouse

A pointing device that controls the movement of the cursor on a screen. Mouse-aware software allows you to activate commands by clicking a mouse button while pointing at objects displayed on the screen.

MPS

Abbreviation for multiprocessing specification.

ms

Abbreviation for millisecond(s).

MTBF

Abbreviation for mean time between failures.

mV

Abbreviation for millivolt(s).

NIC

Acronym for network interface controller.

NiCad

Acronym for nickel cadmium.

NiMH

Abbreviation for nickel-metal hydride.

NMI

Abbreviation for nonmaskable interrupt. A device sends an NMI to signal the microprocessor about hardware errors such as parity errors.

noninterlaced

A technique for decreasing screen flicker by sequentially refreshing each horizontal line on the screen.

ns

Abbreviation for nanosecond(s), one billionth of a second.

NVRAM

Abbreviation for nonvolatile random-access memory. Memory that does not lose its contents when you turn off your system. NVRAM is used for maintaining the date, time, and system setup options.

parallel port

An I/O port used most often to connect a parallel printer to your system. You can usually identify a parallel port on your system by its 25-hole connector.

parameter

A value or option that you specify to a program. A parameter is sometimes called a switch or an argument.

partition

You can divide a hard-disk drive into multiple physical sections called partitions with the **fdisk** command. Each partition can contain multiple logical drives. For example, you could partition a 2-GB hard-disk drive into two physically separate partitions with three logical drive assignments, as shown in the following table.

Physical Partitions and Sizes
Partition 1 - 1.2 GB / Partition 2 - 800 MB
Logical Drive Assignments and Sizes
Drive C - 1.2 GB / Drive D - 500 MB / Drive E - 300 MB

After partitioning the hard-disk drive, you must format each logical drive with the format command.

PC Card

Slightly larger than a credit card, a PC Card is a removable I/O card—such as a modem, LAN, SRAM, or flash memory card—that adheres to the PCMCIA standards. See also PCMCIA.

PCI

Abbreviation for Peripheral Component Interconnect. A standard for local-bus implementation developed by Intel Corporation.

PCMCIA

Abbreviation for Personal system Memory Card International Association. See also PC Card.

PDC

Acronym for primary domain controller.

PERC

Acronym for PowerEdge Expandable RAID controller. This is a Dell-specific RAID controller.

peripheral device

An internal or external device—such as a printer, a disk drive, or a keyboard—connected to a system.

PGA

Abbreviation for pin grid array, a type of microprocessor socket that allows you to remove the microprocessor chip.

pixel

Arranged in rows and columns, a pixel is a single point on a video display. Video resolution—640 x 480, for example—is expressed as the number of pixels across by the number of pixels up and down.

POST

Acronym for power-on self-test. Before the operating system loads when you turn on your system, the POST tests various system components such as RAM, the disk drives, and the keyboard.

ppm

Abbreviation for pages per minute.

program diskette set

The set of diskettes from which you can perform a complete installation of an application program. When you reconfigure a program, you often need its program diskette set.

RAID

Acronym for redundant arrays of independent disks. This phrase was introduced by David Patterson, Garth Gibson, and Randy Katz at the University of California at Berkeley in 1987. The goal of RAID is to use multiple small, inexpensive disk drives to provide high storage capacity and performance while maintaining or improving the reliability of the disk subsystem.

Patterson, Gibson, and Katz described five different methods, which are known as RAID levels 1 through 5. Each level uses one or more extra drives to provide a means of recovering data lost when a disk fails, so that the effective failure rate of the whole disk subsystem becomes very low.

RAID 0

RAID 0 is commonly called striping. This was not originally defined as a RAID level but has since come into popular use. In this array configuration, data is written sequentially across the available disks and no redundancy is provided. RAID 0 configurations provide very high performance but relatively low reliability. RAID 0 is the best choice when controller cards are duplexed. See also striping.

RAID 1

RAID 1 is commonly called mirroring. RAID 1 also uses striping, so RAID 1 may be regarded as the mirroring of RAID 0 configurations. RAID 1 is the best choice in high-availability applications that require high performance or relatively low data capacity. See also mirroring, RAID 10, striping.

RAID 4

RAID 4 is commonly called guarding. It uses data striping, like RAID 0, but adds a single, dedicated parity drive. The parity data stored on this drive can be used to recover data lost from a single failed drive. RAID 4 configurations write data slowly because parity data has to be generated and written to the parity drive, and the generation of the parity data frequently requires reading data from multiple physical drives. See also guarding and striping.

RAID 5

RAID 5, like RAID 4, is commonly called guarding. RAID 5 is identical to RAID 4, except that the parity data is distributed evenly across all physical drives instead of a parity drive. In configurations using a large number of physical drives in which a large number of simultaneous small write operations are being performed, RAID 5 offers potentially higher performance than RAID 4. RAID 4 and RAID 5 configurations are appropriate in high-availability applications where performance is less critical or where high data capacity is required. See also guarding.

RAID 10

RAID 10 is a mirroring technique in which data is duplicated across two identical RAID 0 arrays or hard-disk drives. All data on a physical drive in one array is duplicated, or mirrored, on a drive in the second array. Mirroring offers complete redundancy of data for greater data security. See also mirroring, RAID 1, and striping.

RAM

Acronym for random-access memory. The system's primary temporary storage area for program instructions and data. Each location in RAM is identified by a number called a memory address. Any information stored in RAM is lost when you turn off your system.

RCA

Acronym for Resource Configuration Add-in.

RCU

Acronym for Resource Configuration Utility.

read-only file

A read-only file is one that you are prohibited from editing or deleting. A file can have read-only status if: Its read-only attribute is enabled. It resides on a physically write-protected diskette.

It is located on a network in a directory to which the system administrator has assigned read-only rights to you.

refresh rate

The frequency, measured in Hz, at which the screen's horizontal lines are recharged. A monitor's refresh rate is also referred to as its vertical frequency.

rpm

Abbreviation for revolutions per minute.

SCSI

Acronym for small computer system interface. An I/O bus interface with faster data transmission rates than standard ports. You can connect up to seven devices to one SCSI interface.

SDRAM

Abbreviation for synchronous dynamic random-access memory.

SEC

Abbreviation for single-edge contact.

sec

Abbreviation for second(s).

sector

The fundamental unit of data access for a hard-disk drive. For PC-compatible systems, a sector is usually 512 bytes. See also block and block size.

SEL

Abbreviation for System Event Log.

serial port

An I/O port used most often to connect a modem or a mouse to your system. You can usually identify a serial port on your system by its 9-pin connector.

SMART

Acronym for Self-Monitoring Analysis and Reporting Technology. A technology that allows hard-disk drives to report errors and failures to the system BIOS, which then displays an error message on the screen. To take advantage of this technology, you must have a SMART-compliant hard-disk drive and the proper support in the system BIOS.

SNMP

Abbreviation for Simple Network Management Protocol.

striping

In composite drives with two or more physical drives, the drive array uses a method of data storage called striping. With this method, data is divided into a series of pieces called blocks and each data block is stored on a different physical drive. When each drive contains a block of data, the process starts over with the first physical drive. When the size of the data block is carefully selected, the chance that the information needed can be read from or written to multiple physical drives at once is increased, greatly increasing the performance of the composite drive. See also block, block size, and RAID.

SRAM

Abbreviation for static random-access memory. Because SRAM chips do not require continual refreshing, they are substantially faster than DRAM chips. SRAM is used mostly for external cache memory.

SVGA

Abbreviation for super video graphics array. See also VGA.

switch

See parameter.

system board

As the main circuit board, the system board usually contains most of your system's integral components, such as the following:

- Microprocessor

- RAM

- Expansion-card connectors

- Controllers for standard peripheral devices such as the keyboard

- Various ROM chips

Frequently used synonyms for system board are motherboard and logic board.

system diskette

System diskette is a synonym for bootable diskette.

system memory

System memory is a synonym for RAM.

system setup program

The system setup program options allow you to configure your system's hardware. Some options in the system setup program require that you reboot the system to effect a hardware-configuration change. Because the System Setup program is stored in NVRAM, any options that you set remain in effect until you change them again.

TCP/IP

Abbreviation for Transmission Control Protocol/Internet Protocol.

UPS

Abbreviation for uninterruptible power supply. A battery-powered unit that automatically supplies power to your system in the event of an electrical failure.

USB

Abbreviation for Universal Serial Bus.

USOC

Abbreviation for Universal Service Ordering Code.

utility

A program used to manage system resources—memory, disk drives, or printers, for example. The **diskcopy** command for duplicating diskettes and the **himem.sys** device driver for managing extended memory are utilities included in MS-DOS.

V

Abbreviation for volt(s).

VAC

Abbreviation for volt(s) alternating current.

VCCI

Abbreviation for Voluntary Control Council for Interference.

VDC

Abbreviation for volt(s) direct current.

VDE

Abbreviation for Verband Deutscher Elektrotechniker.

VGA

Abbreviation for video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than EGA and CGA, the previous standards.

To display a program at a specific resolution, you must install the appropriate video drivers and your monitor must support the resolution. Similarly, the number of

colors that a program can display depends on the capabilities of the monitor, the video driver, and the amount of memory installed for the video adapter.

VGA feature connector

On some systems with an integrated VGA video adapter, a VGA feature connector allows you to add an enhancement adapter, such as a video accelerator, to your system. A VGA feature connector can also be called a VGA pass-through connector.

video adapter

The logical circuitry that provides—in combination with the monitor or display—your system's video capabilities. A video adapter may support more or fewer features than a specific monitor offers. Typically, a video adapter comes with video drivers for displaying popular application programs and operating environments in a variety of video modes.

On most current Dell systems, a video adapter is integrated into the system board. Also available are many video adapter cards that plug into an expansion-card connector.

Video adapters can include memory separate from RAM on the system board. The amount of video memory, along with the adapter's video drivers, may affect the number of colors that can be simultaneously displayed. Video adapters can also include their own coprocessor chip for faster graphics rendering.

video driver

Graphics-mode application programs and operating environments, such as Windows, often require video drivers to display at a chosen resolution with the desired number of colors. A program may include some "generic" video drivers. Any additional video drivers may need to match the video adapter; you can find these drivers on a separate diskette with your system or video adapter.

video memory

Most VGA and SVGA video adapters include VRAM or DRAM memory chips in addition to your system's RAM. The amount of video memory installed primarily influences the number of colors that a program can display (with the appropriate video drivers and monitor capability).

video mode

Video adapters normally support multiple text and graphics display modes. Character-based software displays in text modes that can be defined as x columns by y rows of characters. Graphics-based software (such as Windows) displays in graphics modes that can be defined as x horizontal by y vertical pixels by z colors.

video resolution

Video resolution—640 x 480, for example—is expressed as the number of pixels across by the number of pixels up and down. To display a program at a specific graphics resolution, you must install the appropriate video drivers and your monitor must support the resolution.

virus

A self-starting program designed to inconvenience you. Virus programs have been known to corrupt the files stored on a hard-disk drive or to replicate themselves until a system or network runs out of memory.

The most common way that virus programs move from one system to another is via "infected" diskettes, from which they copy themselves to the hard-disk drive. To guard against virus programs, you should do the following:

- Periodically run a virus-checking utility on your system's hard-disk drive.

- Always run a virus-checking utility on any diskettes (including commercially sold software) before using them.

W

Abbreviation for watt(s).

write-protected

Read-only files are said to be write-protected. You can write-protect a 3.5-inch diskette by sliding its write-protect tab to the open position.

WWW

Abbreviation for World Wide Web.

ZIF

Acronym for zero insertion force. Some systems use ZIF sockets and connectors to allow devices such as the microprocessor chip to be installed or removed with no stress applied to the device.

Back to Contents Page

Dell™ PowerEdge™ 7150 Systems User's Guide

● Notes, Notices, Cautions, and Warnings

Notes, Notices, Cautions, and Warnings

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

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

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

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

Figures

Dell™ PowerEdge™ 7150 Systems User's Guide

Tables

Dell™ PowerEdge™ 7150 Systems User's Guide