Dell™ PowerEdge™ 1500SC Systems User's Guide

System Overview
Using the Dell OpenManage Server Assistant CD
Using the System Setup Program
Technical Specifications
I/O Ports and Connectors
Installing and Configuring SCSI Drivers
Glossary

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.

August 2001

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Technical Specifications

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- Microprocessor
- Expansion Bus
- Memory
- Drives
- Ports and Connectors
- Video
- Power
- Physical
- Environmental

Microprocessor	
Microprocessor type	single or dual Intel® Pentium® III microprocessors with a minimum internal operating frequency of at least 1.13 GHz and an external operating frequency of 133 MHz
Front side bus speed	133 MHz
Internal cache	512 KB Level 2 cache

Expansion Bus	
Bus type	PCI
Expansion slots	four 64-bit, 66-MHz slots two 32-bit, 33-MHz slots

Memory	
Architecture	72-bit ECC PC-133 SDRAM, 2-to-1 interleaved
Memory module sockets	four
Memory module capacities	64-, 128-, 256-, 512 MB, or 1 GB
Minimum RAM	128 MB (with one pair of 64-MB modules)
Maximum RAM	4 GB

Drives	
Diskette drive	3.5-inch, 1.44-MB diskette drive
SCSI hard drives	six 1-inch, internal, hot-pluggable Ultra3 SCSI hard drive bays
CD drive	IDE CD drive
DVD drive	optional IDE DVD drive
Tape drive	optional internal SCSI tape drive

Ports and Connectors	
Externally accessible:	
Serial (DTE)	one 9-pin connector; 16550-compatible
Parallel	one 25-pin connector (bidirectional)
Video	one 15-pin connector
PS/2-style keyboard	one 6-pin mini-DIN connector
PS/2-compatible mouse	one 6-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors
NIC	one RJ45 connector for integrated NIC
Internally accessible:	
SCSI channels	two 68-pin Ultra3 SCSI connectors
EIDE channels	two 40-pin EIDE connectors

Video	
Video type	ATI Rage XL video controller; VGA connector
Video memory	4 MB

Power	
DC power supply:	
Wattage	one 350-W power supply, or up to two 350-W power supplies in a redundant configuration (350 usable watts)
Voltage	90-240V, 47/63 Hz
Heat dissipation	1540 BTU/hr maximum per power supply
Maximum inrush current	under typical line conditions and over the entire system ambient operating range, the inrush current may reach 50 A per power supply
System battery	CR2032 3.0-V lithium coin cell

Physical	
Height	43.9 cm (17.3 inches)
Width	26.1 cm (10.3 inches)
Depth	59.2 cm (23.3 inches)
Weight	15.8 kg (35 lb), maximum configuration

Environmental	
Temperature:	
Operating	10° to 35° C (50° to 95° F)
Storage	–40° to 65° C (–40° to 149° F)
Relative humidity:	
Operating	20% to 80% (noncondensing)
Storage	5% to 95% (noncondensing)
Maximum vibration:	
Operating	0.25 G (half-sine wave) at a sweep of 3 to 200 MHz for 15 minutes
Storage	0.5 G at 3 to 200 Hz for 15 minutes
Maximum shock:	
Operating	six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 50 G for up to 2 ms
Storage	six consecutively executed shock pulses in the positive and negative x, y, and z axes (one pulse on each side of the system) of 71 G for up to 2 ms
Altitude:	
Operating	-16 to 3,048 m (-50 to 10,000 ft)
Storage	-16 to 10,600 m (-50 to 35,000 ft)
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.	

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I/O Ports and Connectors

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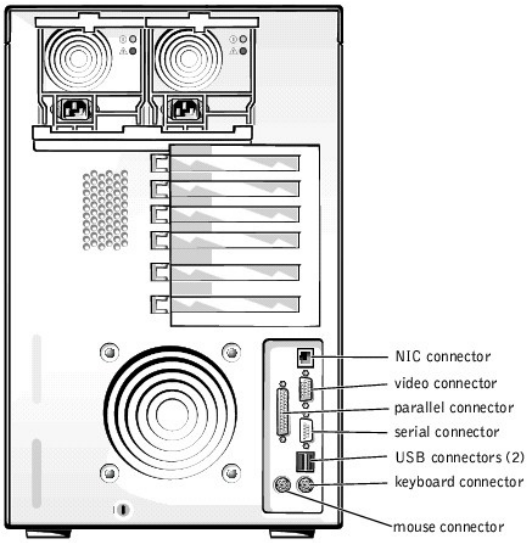
- I/O Ports and Connectors
- Serial and Parallel Connectors
- Keyboard and Mouse Connectors
- Video Connector
- USB Connectors
- Integrated Network Interface Controller Connector

I/O Ports and Connectors

The I/O ports and connectors on the back panel of the system are the gateways through which the 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. I/O Ports and Connectors



Serial and Parallel Connectors

The integrated serial connector uses a 9-pin D-subminiature connector on the back panel. This connector supports 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 connector (for example, COM1 or COM2). The default designation of your system's integrated serial connector is COM1.

The integrated parallel connector uses a 25-pin D-subminiature connector on the system'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 connector is used primarily for printers.

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

Port designations are used, for example, in software installation procedures that include a step in which you identify the connector 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.)

Expansion Cards Having a Serial or Parallel Connector

The system has an autoconfiguration capability for the serial connectors. This feature lets you add an expansion card containing a serial connector that has the same designation as one of the integrated connectors, without having to reconfigure the card. When the system detects the duplicate serial connector on the expansion card, it remaps (reassigns) the integrated connector to the next available designation.

Both the new and the remapped COM connectors share the same interrupt request (IRQ) setting, as follows:

- **COM1, COM3: IRQ4** (shared setting)

- **COM2, COM4: IRQ3** (shared setting)

These COM ports have the following I/O address settings:

- **COM1: 3F8h**
- **COM2: 2F8h**
- **COM3: 3E8h**
- **COM4: 2E8h**

For example, if you add an internal modem card with a port configured as COM1, the system then sees logical COM1 as the address on the modem card. It automatically remaps the integrated serial connector that was designated as COM1 to COM3, which shares the COM1 IRQ setting. (Note that when you have two COM ports sharing an IRQ setting, you can use either port as necessary but you may not be able to use them both at the same time.) If you install one or more expansion cards with serial connectors designated as COM1 and COM3, the corresponding integrated serial connector is disabled.

Before adding a card that remaps the COM ports, check the documentation that accompanied your software to make sure that the software can be mapped to the new COM port designation.

To avoid autoconfiguration, you may be able to reset jumpers on the expansion card so that the card's port designation changes to the next available COM number, leaving the designation for the integrated connector as is. Alternatively, you can disable the integrated connectors through the System Setup program. The documentation for your expansion card should provide the card's default I/O address and allowable IRQ settings. It should also provide instructions for readdressing the connector and changing the IRQ setting, if necessary.

If you add an expansion card containing, for example a parallel connector configured as LPT1 (IRQ7, I/O address 378h), you must go into the System Setup program to remap the integrated parallel connector.

For general information on how your operating system handles serial and parallel ports, and for more detailed command procedures, see your operating system documentation.

Serial Connector

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

Figure B-2. Serial Connector Pin Numbers

Table B-1. 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

Parallel Connector

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

Figure B-3. Parallel Connector Pin Numbers

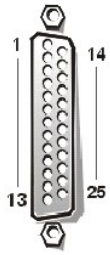


Table B-2. Parallel Connector Pin Assignments

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 system.

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. Figure B-4 illustrates the pin numbers for the keyboard connector and Table B-3 defines the pin assignments and interface signals for the keyboard connector.

Figure B-4. Keyboard Connector Pin Numbers

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. Figure B-5 illustrates the pin numbers for the mouse connector, and Table B-4 defines the pin assignments and interface signals for the mouse connector.

Figure B-5. Mouse Connector Pin Numbers

Table B-4. Mouse Connector Pin Assignments

Pin	Signal	I/O	Definition
1	MFDATA	I/O	Mouse data
2	NC	N/A	No connection
3	GND	N/A	Signal ground
4	FVcc	N/A	Fused supply voltage
5	MFCLK	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 system. 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. Video Connector Pin Numbers

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 system speakers.

NOTICE: Do not attach a USB device or a combination of USB devices that draw a maximum current over 500 milliamperes (mA) per channel or +5 volts (V). Attaching devices that exceed this threshold may 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. USB Connector Pin Numbers

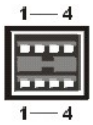


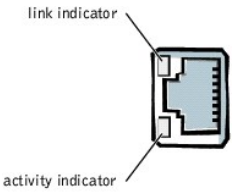
Table B-6. USB Connector Pin Assignments

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 Network Interface Controller Connector

Your system has an integrated 10/100/1000-megabit-per-second (Mbps) network interface controller (NIC). The NIC provides all the functions of a separate network expansion card while providing fast communication between servers and workstations and efficient utilization of host resources, freeing more of the system resources for other applications. It supports 10 Base-T, 100 Base-TX, and 1000 Base-T Ethernet standards.

Figure B-8. NIC Connector



Network Cable Requirements

Your system's RJ45 NIC connector is designed for attaching an unshielded twisted pair (UTP) Ethernet cable equipped with a standard RJ45-compatible plug. 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 10 Base-T, 100 Base-TX, and 1000 Base-T networks.

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

- Use Category 5 or greater wiring and connectors.

- The maximum cable run length (from a workstation to a hub) is 328 ft (100 m).
- Guidelines for operation of a network can be found in "Systems Considerations of Multi-Segment Networks" in the IEEE 802.3 standard.

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Installing and Configuring SCSI Drivers

Dell™ PowerEdge™ 1500SC Systems User's Guide

- The SCSISelect Utility
- Troubleshooting for Windows NT
- Troubleshooting for NetWare

This section describes how to install and configure the Dell SCSI device drivers included with your system. These device drivers are designed to work with the Adaptec AIC-7899 Ultra 160/m SCSI-3 controller on the system board. Each channel of the AIC-7899 supports up to eight internal SCSI hard drives via SCSI backplane boards.

If you are using an optional RAID Controller, see your RAID controller documentation for information on installing your SCSI device drivers.

For instructions on installing SCSI hardware devices such as hard drives, tape drives, or CD drives, see "Installing a Drive in the Peripheral Bay" in the *Installation and Troubleshooting Guide*. After the SCSI devices are installed, install and configure any SCSI device drivers to enable them to communicate with your operating system.

See "Using the Dell OpenManage Server Assistant CD" for instructions on creating a diskette of drivers for your operating system. For instructions on configuring the SCSI device drivers, see the documentation that came with your operating system. You may also need to use the SCSI*Select* utility, discussed in this section.

The SCSI*Select* Utility

The BIOS for the integrated Adaptec AIC-7899 SCSI controller includes the menu-driven SCSI*Select* configuration utility, which allows you to change SCSI controller settings without opening the system. SCSI*Select* also contains SCSI disk utilities that let you low-level format or verify the disk media of your SCSI hard drives.

Starting the SCSI*Select* Utility

You can start the SCSI*Select* utility by pressing <Ctrl><a> when the following prompt appears briefly during start-up:

```
Press <CTRL><A> for SCSISelect™ Utility!
```

The first menu displays the **Configure/View Host Adapter Settings** and **SCSI Disk Utilities** options.

Using SCSI*Select* Menus

SCSI*Select* uses menus to list options that you can select. To select an option, press the up- and down-arrow keys to move the cursor to the option; then press <Enter>.

In some cases, selecting an option displays another menu. You can return to the previous menu at any time by pressing <Esc>. To restore the original SCSI*Select* default values, press <F6>.

SCSI*Select* Default Settings

Default settings for the integrated AIC-7899 SCSI controller are shown in Table C-1. These default settings are appropriate for most PCI systems. Run SCSI*Select* only if you need to change any of the default settings.

NOTE: To change the configuration settings, you must run the SCSI*Select* utility.

NOTE: If the host adapter does not control the bootable hard drive, you may want to disable its BIOS.

For situations in which you might want or need to change the settings, see the description of each setting in the following subsections. To change any of the default settings or to format or verify a disk, see "Using the SCSI Disk Utilities."

Table C-1. AIC-7899 SCSI Controller Settings

Setting	Default
SCSI Bus Interface Definitions:	
Host Adapter SCSI ID	7
SCSI Parity Checking	Enabled
Host Adapter SCSI Termination	Enabled or Automatic
Boot Device Options:	
Boot Channel	A First
Boot SCSI ID	0
Boot LUN Number	0
SCSI Device/Configuration:	
Sync Transfer Rate MB/Sec	160
Initiate Wide Negotiation	Yes (Enabled)

Enable Disconnection	Yes (Enabled)
Send Start Unit Command	Yes (Enabled)
Enable Write Back Cache	Yes or N/C
BIOS Multiple LUN Support	No (Enabled)
Include in BIOS Scan	Yes (Enabled)
Advanced Configuration:	
Reset SCSI Bus at IC Initialization	Enabled
Display <Ctrl><a> Message During BIOS Initialization	Enabled
Extended BIOS Translation For DOS Drivers > 1 GB	Enabled
Silent/Verbose Mode	Verbose
Host Adapter BIOS	Enabled
Domain Validation	Enabled
Support Removable Disks Under BIOS As Fixed Disks	Boot Only
BIOS Support For Bootable CD	Enabled
BIOS Support For Int 13 Extensions	Enabled
Support For Ultra SCSI Speed	Enabled
NOTE: For the full name of an abbreviation or acronym used in this table, see the Glossary.	

SCSI Bus Interface Definitions

The basic host adapter settings are the SCSI*Select* settings most likely to require modification:

- **Host Adapter SCSI ID** — Sets the host adapter's SCSI ID. The default setting is **SCSI ID 7**, which allows the host adapter to support narrow SCSI devices in addition to wide SCSI devices. Dell recommends that you leave the host adapter set to **SCSI ID 7**.
- **SCSI Parity Checking** — Determines whether the host adapter verifies the accuracy of data transfer on the SCSI bus. The default setting is **Enabled**. You should disable **SCSI Parity Checking** if any SCSI device connected to the host adapter does not support SCSI parity; otherwise, leave it enabled. Most SCSI devices support SCSI parity. If you are unsure whether a device supports SCSI parity, consult the documentation for the device.
- **Host Adapter SCSI Termination** — Sets termination on the host adapter. The default setting for the AIC-7899 host adapter is **Enabled or Automatic**. Dell recommends that you leave this option set to the default.

Boot Device Options

The boot device options allow you to specify the device from which to boot your system:

- **Boot SCSI ID** — Specifies the boot channel (A or B) for the dual-channel Adaptec 7899 host adapter. The default is **A First**.
- **Boot LUN Number** — Allows you to specify a particular logical unit number (LUN) from which to boot your boot device if your boot device has multiple LUNs and **BIOS Multiple LUN Support** is enabled (see "SCSI Device/Configuration Settings"). The default setting is **LUN 0**.

SCSI Device/Configuration Settings

The SCSI device/configuration settings allow you to configure certain parameters for each device on the SCSI bus. To configure a specific device, you must know the SCSI ID assigned to that device. If you are not sure of the SCSI ID, see "Using the SCSI Disk Utilities."

- **Sync Transfer Rate MB/sec** — Sets the maximum synchronous data transfer rate that the host adapter supports.

  The AIC-7899 host adapter supports rates up to 160 megabytes per second (MB/sec). The default for the AIC-7899 host adapter is **160 MB/sec**.

  If the host adapter is set to not negotiate for synchronous data transfer, the maximum synchronous transfer rate is the maximum rate that the host adapter accepts from the device during negotiation. (This setting is standard SCSI protocol.)

- **Initiate Wide Negotiation** — Determines whether the host adapter attempts 16-bit data transfer instead of 8-bit data transfer. The default is **Yes**.

  NOTE: Some 8-bit SCSI devices may have trouble handling wide negotiation, which may result in erratic behavior or a hang condition. For these devices, set **Initiate Wide Negotiation** to **No**.

  When this option is set to **Yes**, the host adapter attempts 16-bit data transfer. When this option is set to **No**, 8-bit data transfer is used unless the SCSI device itself requests wide negotiation. The effective transfer rate is doubled when 16-bit data transfer is used because the data path for wide SCSI is twice the size of normal 8-bit SCSI.

- **Enable Disconnection** (sometimes called disconnect/reconnect) — Determines whether the host adapter allows the SCSI device to disconnect from the SCSI bus. Enabling disconnection allows the host adapter to perform other operations on the SCSI bus while the SCSI device is temporarily disconnected. The default setting is **Yes**.

  Leave **Enable Disconnection** set to **Yes** if two or more SCSI devices are connected to the host adapter. This optimizes SCSI bus performance. If only one SCSI device is connected to the host adapter, set **Enable Disconnection** to **No** to achieve slightly better performance.

- **Send Start Unit Command** — Determines whether the start unit command is sent to the SCSI device during the boot routine. The default is **Yes**.

  Setting this option to **Yes** reduces the load on your system's power supply by allowing the host adapter to start SCSI devices one at a time when you boot your system. When this option is set to **No**, the devices are allowed to start at the same time. Most devices require you to set a jumper before they can respond to this command.

  NOTE: For many devices, if **Send Start Unit Command** is set to **Yes**, the boot routine time will vary depending on how long it takes each drive to start.

- **Enable Write Back Cache** — Signals the completion of a write request as soon as the data is in cache. Actual writing to the disk occurs at a later time. The default setting is **N/C or Yes**.
- **BIOS Multiple LUN Support** — Provides support for peripherals that contain multiple SCSI devices, such as autoloading tape drives and CD changers.

  NOTE: The setting for **BIOS Multiple LUN Support** must be **No** or **Enabled** (default) if a tape autoloader is connected.

- **Include in BIOS Scan** — Enables you to set whether the system BIOS scans this device during system start-up. The default is **Yes**.

Advanced Configuration Settings

The advanced host adapter settings should not be changed unless absolutely necessary. These values are set by Dell, and changing them may cause conflicts with the SCSI devices.

- **Reset SCSI Bus at IC Initialization** — Enables the SCSI bus to be reset when the controller is initialized. The default is **Enabled**.
- **Display <Ctrl><a> Message During BIOS Initialization** — Determines whether the `Press <CTRL><A> for SCSISelect™ Utility!` message appears on your screen during system start-up. The default setting is **Enabled**. If this setting is disabled, you can still run the SCSI*Select* utility by pressing <Ctrl><a> after the host adapter BIOS banner appears.
- **Extended BIOS Translation For DOS Drives > 1 GB** — Determines whether extended translation is available for SCSI hard drives with capacities greater than 1 GB. The default setting is **Enabled**.

NOTICE: Back up your hard drive before you change the translation scheme. All data is erased when you change from one translation scheme to another.

The standard translation scheme for SCSI host adapters provides a maximum accessible capacity of 1 GB. To support hard drives larger than 1 GB, the 78*xx* series host adapters include an extended translation scheme that supports hard drives as large as 8 GB, with a maximum partition size of 2 GB under the DOS operating system.

It is not necessary to enable the **Extended BIOS Translation** setting if you are using another operating system.

When you partition a hard drive larger than 1 GB, use the MS-DOS® **fdisk** utility as you normally would. Because the cylinder size increases to 8 MB under extended translation, the partition size you choose must be a multiple of 8 MB. If you request a size that is not a multiple of 8 MB, **fdisk** rounds up to the nearest whole multiple of 8 MB.

- **Silent/Verbose Mode** — Displays the host adapter information during system start-up. The default is **Verbose**.
- **Host Adapter BIOS** — Enables or disables the host adapter BIOS. The default setting is **Enabled**.

  NOTE: Several SCSI*Select* options are not valid unless the host adapter BIOS is enabled.

  If you are booting from a SCSI hard drive connected to the host adapter, the BIOS must be enabled. You should disable the host adapter BIOS if the peripherals on the SCSI bus (for example, CD drives) are all controlled by device drivers and do not need the BIOS.

- **Domain Validation** — Instructs the host adapter not to accept a negotiated speed until a validation test is successfully performed. After determining the speed that a target device is capable of, the host adapter sends a **Write Buffer** command to the target device. The data transfer occurs at the full speed initially. The initiator reads and tests the data and identifies any parity or cyclic redundancy check (CRC) errors. If the test fails, the initiator lowers its speed and repeats the test. In this manner, a compatible speed will be found and locked in before user data transfers begin. The default is **Enabled**.
- **Support Removable Disks Under BIOS As Fixed Disks** — Controls which removable-media drives are supported by the host adapter BIOS. The default setting is **Boot Only**. The following choices are available.

NOTICE: If a removable-media SCSI device is controlled by the host adapter BIOS, do not remove the media while the drive is on or you might lose data. If you want to be able to remove media while the drive is on, install your removable-media device driver and set this option to **Disabled.**

  - **Boot Only** — Only the removable-media drive designated as the boot device is treated as a hard drive.
  - **All Disks** — All removable-media drives supported by the BIOS are treated as hard drives.
  - **Disabled** — No removable-media drives are treated as hard drives. In this situation, software drivers are needed because the drives are not controlled by the BIOS.

- **BIOS Support For Bootable CD-ROM** — Determines whether the host adapter BIOS provides support for booting from a CD drive. The default setting is **Enabled**.
- **BIOS Support For Int 13 Extensions** — Determines whether the host adapter BIOS supports disks with more than 1024 cylinders. The default setting is **Enabled**.
- **Support For Ultra SCSI Speed** — Determines whether the host adapter supports the fast transfer rates (20–40 MB/sec). The default setting is **Enabled**.

Using the SCSI Disk Utilities

To access the SCSI disk utilities, select **SCSI Disk Utilities** from the menu that appears when you start SCSI*Select*. When the option is selected, SCSI*Select* immediately scans the SCSI bus (to determine the devices installed) and displays a list of all SCSI IDs and the device assigned to each ID.

When you select a specific ID and device, a menu appears, displaying the **Format Disk** and **Verify Disk Media** options.

NOTICE: The **Format Disk** option destroys all data on the hard drive.

- **Format Disk** — Runs a utility that allows you to perform a low-level format on a hard drive. Most SCSI disk drives are formatted at the factory and do not need to be formatted again. The Adaptec Format Disk utility is compatible with the majority of SCSI disk drives.
- **Verify Disk Media** — Runs a utility that allows you to scan the media of a hard drive for defects. If the utility finds bad blocks on the media, it prompts you to reassign them; if you select **Yes**, those blocks are no longer used. You can press <Esc> at any time to exit the utility.

Exiting SCSI*Select*

To exit SCSI*Select*, press <Esc> until a message prompts you to exit. (If you changed any 78*xx* series host adapter settings, you are prompted to save the changes before you exit.) At the prompt, select **Yes** to exit, and then press any key to reboot the system. Any changes that you made in SCSI*Select* take effect after the system boots. (You can select **No** at the prompt if you are not ready to exit SCSI*Select*.)

Troubleshooting for Windows NT

The boot manager for Windows NT® contains recovery logic to allow you to return to the last known good configuration. If you have changed your host adapter configuration and Windows NT no longer boots, perform the following steps to recover it:

1. Undo any hardware changes that you have made to the system since it was last operational.
2. Reboot the system. Watch the display carefully during start-up. If the following message appears, press the spacebar, type l at the next screen, and then follow the instructions on the screen to continue booting with the last known good configuration:

   ```
   Press spacebar NOW to invoke the Last Known Good menu
   ```

3. When your system is operational again, check all of the hardware and software configuration changes that you want to make. Look specifically for conflicts with parts of the existing system configuration that are not being changed.

   If you cannot determine the source of the error, see, "Getting Help" in the *Installation and Troubleshooting Guide* for instructions on contacting Dell for technical assistance.

Troubleshooting for NetWare

Any error that occurs while the driver is initializing prevents it from loading. If an error does occur, the driver causes the system to beep and then display the following numbered error message:

xxx message

The *xxx* indicates the error code and *message* is a line of text describing the error. The error codes are divided into three categories:

- 000-099 — Non-host-adapter specific
- 100-299 — Host-adapter specific
- 300-999 — Reserved

Specific error codes, such as those in the following subsections, appear only if you have installed the host adapters and drivers that generate them.

Non-Host-Adapter Specific Error Codes

The following error codes alert you to error conditions caused by factors not related to the host adapter:

```
000 Failed ParseDriverParameters call
```

A call to the NetWare® ParseDriverParameters routine has failed for some unknown reason. The command line contains errors, or you pressed <Esc> at the port or slot prompt.

```
001 Unable to reserve hardware, possible conflict
```

The driver failed in its attempt to reserve the host adapter's hardware settings (that is, direct memory access [DMA] and interrupt request [IRQ] settings). Another card in your system may be causing a conflict with the host adapter.

```
002 NetWare rejected card Failed AddDiskSystem call
```

The driver failed in its attempt to register the host adapter with NetWare. The file server may not have enough memory.

```
003 Invalid command line option entered > option
```

An invalid option was entered on the command line. The invalid option that was entered is also displayed.

```
004 Invalid command line, please enter correctly
```

The driver was unable to understand the command line options that you entered. Be sure that you have entered these options correctly.

Host-Adapter Specific Error Codes

The following error codes alert you to error conditions caused by factors related to the host adapter:

```
200 No host adapter found for this driver to register
```

No Adaptec 78*xx* host adapter was found in your system for the driver to register. Be sure that the host adapter is properly configured and properly seated in the slot.

```
203 Invalid 'device' setting
```

You have entered an invalid slot setting on the command line. You can only enter slot numbers for valid host adapters. If you load without the slot option, you will be prompted to enter a valid value.

`204 Invalid 'verbose' setting, use 'y'`

You can only enter y for this option (`verbose=y`).

`205 Invalid 'removable' setting, use 'off'`

You can only enter off for this option (`removable=off`).

`206 Invalid 'fixed_disk' setting, use 'off'`

You can only enter off for this option (`fixed_disk=off`).

`208 SCSI present but not enabled/configured for PCI`

A host adapter is present, but its bus or device entry has not been enabled.

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System Overview

Dell™ PowerEdge™ 1500SC Systems User's Guide

- System Orientation
- Front-Panel Indicators and Features
- Back-Panel Features
- System Features
- Supported Operating Systems
- Power Protection Devices
- Other Documents You May Need
- Obtaining Technical Assistance

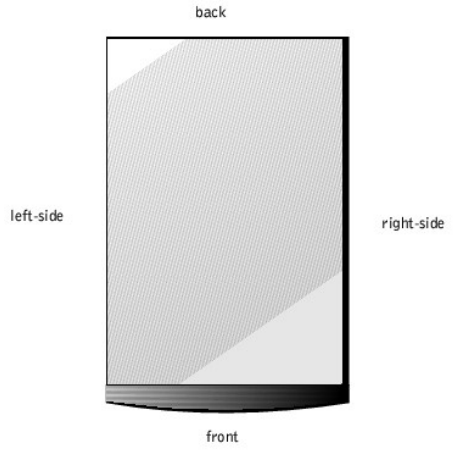
Your system, which has one- or two-way-capable Intel® Pentium® III microprocessors, is a full-featured server that provides a robust, reliable, platform for both large and small customers.

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

System Orientation

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

Figure 1-1. System Orientation



Front-Panel Indicators and Features

Figure 1-2 shows the indicators and features located on the front panel.

Figure 1-2. Front-Panel Features

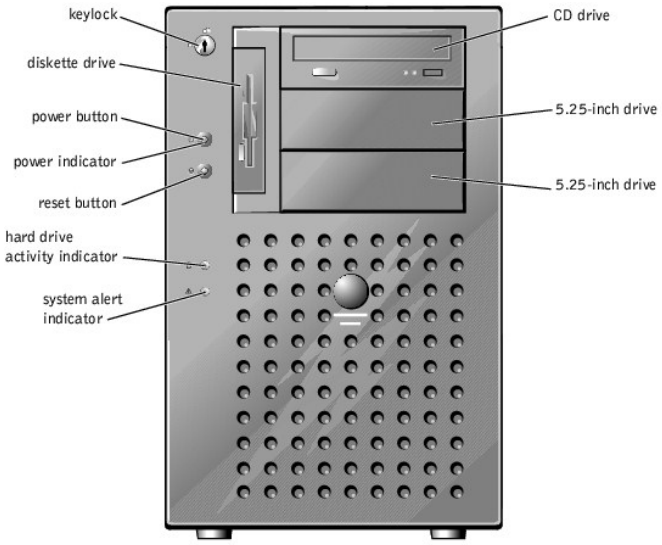
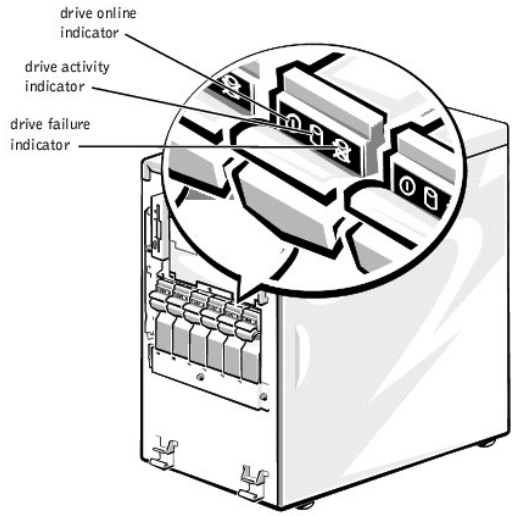


Figure 1-3 shows the indicators on each of the SCSI hard drive carriers that provide the following information:

- Drive online indicator — (round icon) lights when the hard drive is receiving power
- Drive activity indicator — (cylinder icon) lights when data is transferred to or from the hard drive
- Drive failure indicator — (X icon) if the system uses an optional RAID controller, either an integrated controller or a host adapter card, the indicator lights if a drive failure is detected

Figure 1-3. Hard-Drive Indicators

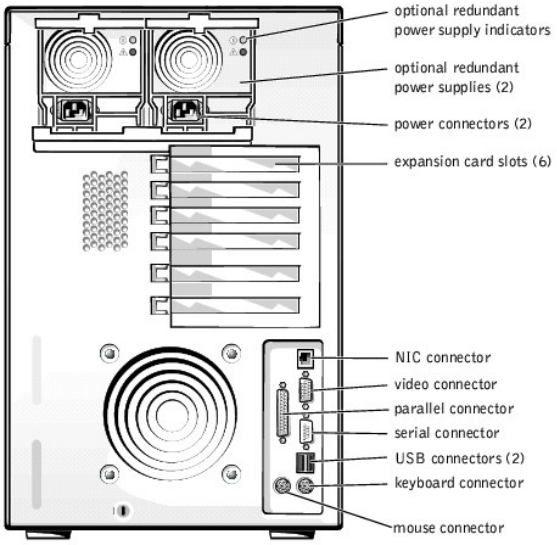


Back-Panel Features

Figure 1-4 shows the back-panel features of the system.

NOTE: The following figure shows the optional redundant AC power supplies installed.

Figure 1-4. Back-Panel Features



When connecting external devices to your system, follow these guidelines:

- 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.
- Always attach external devices while your system is turned off. Next, 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.)

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

System Features

Your system offers the following features:

- One or two Intel Pentium III microprocessors with an external bus speed of 133 MHz and an internal operating speed of at least 1.13 GHz
- Front-side bus speed of 133 MHz
- Level 2 cache of 512 KB
- Support for SMP, which is available by installing additional microprocessors. SMP greatly improves overall system performance by dividing microprocessor operations among the independent microprocessors. To take advantage of this feature, you must use an operating system that supports multiprocessing.

  NOTE: If you decide to upgrade your system by installing a second microprocessor, 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. Both microprocessors must have the same internal operating frequency and cache size.

- A minimum of 128 MB of system memory, upgradable to a maximum of 4 GB by installing combinations of 64-, 128-, 256-, 512-MB, or 1-GB registered PC-133 SDRAM memory module pairs in the four memory module sockets on the system board.
- Support for up to six 1-inch, internal, hot-pluggable Ultra3 SCSI hard drives.
- An optional, redundant power supply distribution board to accommodate up to two independent power supplies.

The system board includes the following built-in features:

- Six PCI slots located on the system board. PCI slots 1 through 4 are 64-bit, 66 MHz slots; PCI slots 5 and 6 are 32-bit, 33 MHz slots.
- An integrated VGA-compatible video subsystem with an ATI RAGE XL video controller. This video subsystem contains 4 MB of SDRAM video memory (nonupgradable). Maximum resolutions are 1600 x 1200 x 64 K colors (noninterlaced). In 1280 x 1024-pixel, 1024 x 768-pixel, 800 x 600-pixel, and 640 x 480-pixel resolutions, 16.7 million colors are available for true-color graphics.
- Embedded dual-channel Ultra3 SCSI controller.
- An integrated Intel Gigabit Ethernet controller, capable of supporting 10 Mb/s, 100 Mb/s, or 1000 Mb/s data rates.
- Server management circuitry that monitors operation of the system fans as well as critical system voltages and temperatures. The server management circuitry works in conjunction with the server management software.

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

The following software is included with your system:

- 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."
- Enhanced security features, including a user password and a supervisor password, available through the system setup program.
- Diagnostics for evaluating your system's components and devices. For information on using the system diagnostics, see "Running the System Diagnostics" in your *Installation and Troubleshooting Guide*.

Supported Operating Systems

Your system supports the following operating systems:

- Microsoft® Windows® 2000 Server
- Microsoft Windows NT® 4.0 Server
- Red Hat Linux 7.*x*
- Novell® NetWare® version 5.*x*

Power Protection Devices

A number of devices are available that protect against 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* document provides general instructions for setting up your system.
- The system management software documentation, which describes the features, requirements, installation, and basic operation of the server management software. See the software's online help for information about the alert messages issued by the software.
- The *Installation and Troubleshooting Guide* describes how to upgrade or troubleshoot your system.
- The *System Information* document for important safety, regulatory, and applicable warranty information.

You may 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 configure and install 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 drive to provide last-minute updates about technical changes to your system or advanced technical reference material intended for experienced users or technicians.

Obtaining Technical Assistance

If at any time you do not understand a procedure described in this guide or if your system does not perform as expected, 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*.

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Using the Dell OpenManage Server Assistant CD

Dell™ PowerEdge™ 1500SC Systems User's Guide

- Starting the Dell OpenManage Server Assistant CD
- Navigating the CD
- Setting Up Your Server
- Utility Partition
- Asset Tag Utility

The *Dell OpenManage Server Assistant* CD contains utilities, diagnostics, drivers, and other items that can help you configure your system to best meet your needs. Some of the functions available on the *Dell OpenManage Server Assistant* CD are also available on a bootable utility partition that is installed on your hard drive. This section describes how to use the *Dell OpenManage Server Assistant* CD. It also describes the utility partition and its options and provides instructions for reinstalling the partition (if necessary).

Starting the Dell OpenManage Server Assistant CD

The Dell OpenManage™ Server Assistant application program has two modes of operation: a *setup mode* for setting up your system and installing your operating system, and a *service mode* for creating diskettes and viewing information. Documentation is available on the online documentation CD.

In both setup mode and service mode, the **Dell OpenManage Server Assistant** main screen gives you the option to choose one of the supported languages as the language for the screen text. You can choose a language at any time from the main screen.

Setup Mode

To set up your system and install your operating system, insert the *Dell OpenManage Server Assistant* CD into your CD drive, and turn on or reboot the system. The **Dell OpenManage Server Assistant** main page appears.

If the CD does not boot, verify that the CD drive is specified first in the **Boot Sequence** option in the System Setup program (see "Using the System Setup Program").

Service Mode

You can create system diskettes and view information on any system that has Microsoft® Internet Explorer 4.0 (or later). When you insert the CD in a system that uses the Microsoft Windows® operating system, the system automatically starts the browser software and displays the **Dell OpenManage Server Assistant** main page.

Navigating the CD

The *Dell OpenManage Server Assistant* CD utilizes a standard Web browser interface. Navigating the CD is accomplished by clicking the mouse on the various icons and text hyperlinks.

Click the **Back** icon to return to the previous screen. Click the **Exit** icon to exit the program. Exiting the program causes the system to reboot to the standard operating-system boot partition.

Setting Up Your Server

If you purchase a system that does not have an operating system preinstalled by Dell, or if you reinstall an operating system at a later date, use the **Server Setup** option to configure your system or install your operating system.

Server Setup Mode

Dell recommends using the **Server Setup** program for most situations including installing and reinstalling an operating system. The *Dell OpenManage Server Assistant* CD guides you through the operating system setup and configuration process. If a Dell RAID controller is installed, the Dell RAID utility configures the drives. If the drive does not have a utility partition, one is created. The program prompts you to select the operating system used on the drive and leads you through a step-by-step process to install the operating system.

To start the Server Setup program, perform the following steps:

1. Click the **SETUP** icon at the top of the screen.
2. Click **Server Setup**.

After you start the Server Setup program, follow the directions on the screen to complete the installation and configuration process. The Server Setup program takes you through the following tasks:

- Configuring your RAID controller (if applicable)
- Entering operating system and hard drive information
- Entering operating system configuration
- Installing an operating system

Utility Partition

The utility partition is a bootable partition on the hard drive that provides some of the functions available on the *Dell OpenManage Server Assistant* CD. Most of the application programs found on the CD are contained in the utility partition. When implemented, the partition boots and provides an executable environment for the partition's utilities. When the utility partition is not booted, it is designated as a non–MS-DOS® partition.

NOTE: The utility partition provides only limited MS-DOS functionality and cannot be used as a general-purpose MS-DOS partition.

To start the utility partition, turn on or reboot the system. During the POST, the following message appears:

```
<F10> = Utility Mode
```

The utility partition provides a text-based interface from which you can run the partition's utilities. To select a menu option, you can either use the arrow keys to highlight the option and press <Enter>, or type the number of the menu option. To exit the utility partition, press <Esc> from the **Main Menu**. Exiting the utility from setup mode causes the system to reboot to the standard operating-system boot partition.

Table 2-1 provides a sample list and explanation of the options that appear on the utility partition menu even when the *Dell OpenManage Server Assistant* CD is not in the CD drive. The options displayed on your system may vary depending on the configuration.

NOTE: Although most options are available from both the *Dell OpenManage Server Assistant* CD and the utility partition, some options or features are available only from the CD.

Table 2-1. Utility Partition Main Menu Options

Option	Description
Run System Diagnostics	Runs the system hardware diagnostics.
Run RAID Configuration Utility	Runs the RAID controller configuration utility if a RAID controller card is installed.
NOTE: The options displayed on your system are dependent on your system configuration and may not include all of those listed here. For the full name of an abbreviation or acronym used in this table, see the Glossary.	

Running the System Diagnostics

You can run the system diagnostics from the utility partition, but not from the *Dell OpenManage Server Assistant* CD. From the **Utility Partition** menu, select **Run System Diagnostics**. To run the diagnostics from a set of diskettes, create diagnostics diskettes from the *Dell OpenManage Server Assistant* CD.

The system hardware diagnostics are described in "Running the System Diagnostics" in your *Installation and Troubleshooting Guide*.

Asset Tag Utility

The Asset Tag utility allows you to enter an asset tag number for your system.

NOTE: The Asset Tag utility works only on systems running MS-DOS.

Using the Asset Tag Utility

To create the Asset Tag utility diskette and boot the system, perform the following steps:

1. If you have not already done so, create a bootable *Asset Tag Utilities With CD* diskette from the *Dell OpenManage Server Assistant* CD using the **Create Diskettes** option.
2. Insert the diskette into the diskette drive and reboot the system.

NOTE: The Asset Tag utility diskette contains CD drivers that provide access to the CD drive when you boot from the diskette.

Assigning and Deleting an Asset Tag Number

An asset tag number can have up to ten characters; any combination of characters, excluding spaces, is valid.

To assign or change an asset tag number, perform the following steps:

1. Perform the steps in "Using the Asset Tag Utility."
2. Type asset and a space followed by the new number.

   For example, type the following command:

   ```
   asset 1234567890
   ```

3. Press <Enter>.
4. When you are prompted to verify the asset tag number, type y and press <Enter>.

   The system then displays the new or modified asset tag number and the service tag number.

To delete the asset tag number without assigning a new one, type asset /d and press <Enter>.

Table 2-2 lists the command-line options you can use with the Asset Tag utility. To use one of these options, type asset and a space followed by the option.

Table 2-2. Asset Tag Command-Line Options

Asset Tag Option	Description
/d	Deletes the asset tag number
/?	Displays the Asset Tag utility help screen

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Using the System Setup Program

Dell™ PowerEdge™ 1500SC Systems User's Guide

- Entering the System Setup Program
- System Setup Options
- Using the System Password Feature
- Using the Setup Password Feature
- Disabling a Forgotten Password

Each time you turn on your system, the system compares the configuration of the hardware installed in the system to the hardware listed in the system configuration information stored in NVRAM on the system board. If the system detects a discrepancy, it generates error messages that identify the incorrect configuration settings. The system then prompts you to enter the System Setup program to correct the setting.

You can use the System Setup program as follows:

- To change the system configuration information after you add, change, or remove any hardware in your system
- To set or change user-selectable options—for example, the time or date on your system
- To enable or disable all 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. Print the System Setup screens (by pressing <Print Screen>) or record the information for future reference.

Entering the System Setup Program

1. Turn on your system.

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

2. Press <F2> immediately after you see the following message in the upper right corner of the screen:

   ```
   Press <F2> for System Setup
   ```

   You can also press <F10> to enter Utility Mode or <F12> for PXE Boot, which forces a system boot from the network.

   If you wait too long and your operating system begins to load into memory, let the system complete the load operation; then, 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."

   NOTE: For help using the System Setup program, press <F1> while in the program.

Responding to Error Messages

If an error message appears on your screen while the system is starting up, 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.

NOTE: 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, see "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
Down arrow or <Tab>	Moves to the next field.
Up arrow or <Shift + Tab>	Moves to the previous field.
<+> or <-> or <space>	Cycles through the settings in a field. In many fields, you can also type the appropriate value.
<Esc>	Exits the System Setup program and reboots the system if any changes were made.

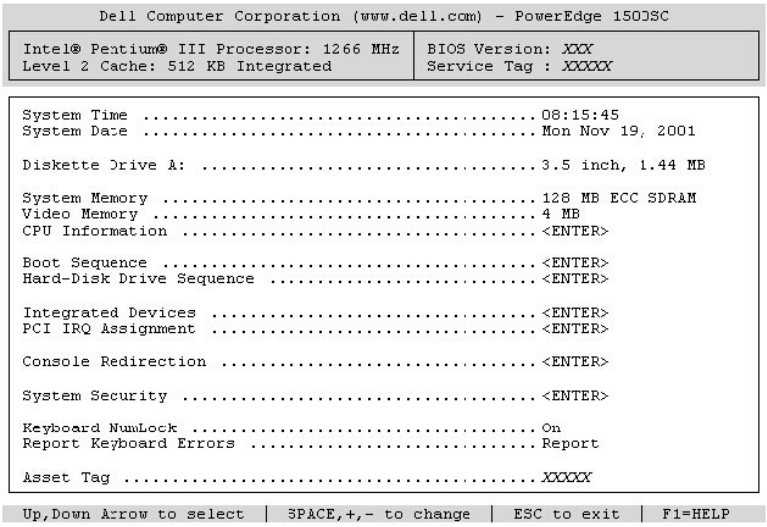
System Setup Options

The following subsections outline the options on the System Setup screens.

Main Screen

When the System Setup program runs, the main program screen appears (see Figure 3-1).

Figure 3-1. Main System Setup Screen



The following options or information fields appear on the main System Setup screen:

- **System Time** — Resets the time on the system's internal clock.
- **System Date** — Resets the date on the system's internal calendar.
- **Diskette Drive A:** — Allows you to specify the type of diskette drive for your system.
- **System Memory** — Displays the amount of system memory. This option has no user-selectable settings.
- **Video Memory** — Displays the amount of video memory. This option has no user-selectable settings.
- **CPU Information** — Displays information related to the microprocessor bus and microprocessors. This screen has no user-selectable settings.
- **Boot Sequence** — Displays the **Boot Sequence** screen, discussed later in this section.
- **Hard-Disk Drive Sequence** — Displays the **Hard-Disk Drive Sequence** screen, discussed later in this section.
- **Integrated Devices** — Displays the **Integrated Devices** screen, discussed later in this section.
- **PCI IRQ Assignment** — Displays a screen that allows you to change the IRQ allocated to each of the integrated devices on the PCI bus, as well as any installed expansion cards that require an IRQ.
- **Console Redirection** — Displays a screen that allows you to configure console redirection. The sub-menu allows you to turn the feature on or off, select the remote terminal type, and enable or disable redirection after booting.
- **System Security** — Displays a screen that allows you to configure the system password and setup password features. See "Using the System Password Feature" and "Using the Setup Password Feature" for more information.
- **Keyboard NumLock** — Determines whether your system starts up with the NumLock mode activated on 101- or 102-key keyboards (does not apply to 84-key keyboards).
- **Report Keyboard Errors** — Enables or disables reporting of keyboard errors during the POST. This option is useful when applied to self-starting servers or host systems that have no permanently attached keyboard. In these situations, selecting **Do Not Report** suppresses all error messages relating to the keyboard or keyboard controller during POST. This setting does not affect the operation of the keyboard itself if a keyboard is attached to the system.
- **Asset Tag** — Displays the asset tag number for the system if an asset tag number has been assigned. To enter an asset tag number of up to 10 characters into NVRAM, see "Asset Tag Utility" in "Using the Dell OpenManage Server Assistant CD."

Boot Sequence Screen

The **Boot Sequence** screen options determine the order in which the system looks for the files that it needs to load during system startup. Available options include the diskette drive, CD drive, network, and hard drive. You can enable or disable a device by selecting it and pressing the spacebar. To change the order in which devices are searched, use the <+> and <–> keys.

Hard-Disk Drive Sequence Screen

The Hard-Disk Drive Sequence screen options determine the order in which the system searches the hard drives for the files that it needs to load during system startup. The choices depend on the particular hard drives installed in your system. You can enable or disable a device by selecting it and pressing the spacebar. To change the order in which devices are searched, use the <+> and <–> keys.

Integrated Devices Screen

This screen is used to configure the following devices:

- **SCSI Controller** — Selecting **On** (the default setting) enables the integrated PCI SCSI controller and scans the associated ROM. For the system to start from a drive attached to the integrated SCSI controller, the drive must be enabled. Selecting **Off** causes the BIOS to mask the presence of a device.
- **Network Interface Controller** — Determines whether the system's integrated NIC is enabled. Changes take effect after reboot.
- **NIC MAC Address** — Displays the media access control (MAC) address used by the integrated NIC. This field has no user-selectable settings.
- **Mouse Controller** — Enables or disables the system's mouse controller. Disabling the mouse controller allows an expansion card to use IRQ12.
- **Serial Port 1** — Configures the system's integrated serial port. The options can be set to **Auto** (the default) to automatically configure a port, to a particular designation, or to **Off** to disable the port.

  If you set a serial port to **Auto** and add an expansion card with a port configured to the same designation, the system automatically remaps the integrated port to the next available port designation that shares the same IRQ setting.
- **Parallel Port** — Configures the system's integrated parallel port. The options can be set a particular designation or to **Off** to disable the port.
- **Parallel Port Mode** — Controls whether the system's integrated parallel port acts as an AT-compatible (unidirectional) or PS/2-compatible (bidirectional) port. To determine the correct mode to use, see the documentation that came with the peripheral device connected to the parallel port.
- **USB Controller** — Enables or disables the system's USB ports. Disabling the USB ports makes system resources available for other devices.
- **BIOS USB Support** — Enables or disables the system's BIOS USB support. If you have a PS/2 keyboard attached to the system, selecting **OFF** completely disables the system's USB BIOS support. If you do not have a PS/2 keyboard attached to your system and you select **OFF**, the USB mouse and keyboard are functional only during the boot process. When set to **ON**, the USB mouse and keyboard are controlled by the BIOS until a USB device driver is loaded by the operating system.
- **IDE Controller** — Enables or disables the system's IDE interface.
- **Diskette Controller** — Enables or disables the system's diskette drive controller. When **Auto** (default) is selected, the system turns off the controller when necessary to accommodate a controller card installed in an expansion slot.

System Security Screen

You can set the following security features through the **System Security** screen:

- **Password Status** — When **Setup Password** is set to **Locked**, this feature allows you to prevent the system password from being changed or disabled at system start-up.

  To lock the system password, you must first assign a setup password in the **Setup Password** option and then change the **Password Status** option to **Locked**. In this state, the system password cannot be changed through the **System Password** option and cannot be disabled at system start-up by pressing <Ctrl><Enter>.

  To unlock the system password, you must enter the setup password in the **Setup Password** option and then change the **Password Status** option to **Unlocked**. In this state, the system password can be disabled at system start-up by pressing <Ctrl><Enter> and then changed through the **System Password** option.
- **System Password** — Displays the current status of your system's password security feature and allows you to assign and verify a new system password.

  NOTE: See "Using the System Password Feature" for instructions on assigning a system password and using or changing an existing system password. See "Disabling a Forgotten Password" for instructions on disabling a forgotten system password.
- **Setup Password** — Allows you to restrict access to the System Setup program in the same way that you restrict access to your system with the system password feature.

  NOTE: See "Using the Setup Password Feature" for instructions on assigning a setup password and using or changing an existing setup password. See "Disabling a Forgotten Password" for instructions on disabling a forgotten setup password.
- **Chassis Intrusion** — Enables the system chassis intrusion switch to detect if the front bezel is removed. If this option is set to **Enabled**, a warning message is displayed during system startup. If the option is set to **Enabled – Silent**, no startup message is displayed, but the **Chassis Intrusion** option will change to **Detected**.
- **Power Button Override** — when **Power Button Override** is set to **Disabled**, you can use the power button to turn the system off, or shut down the system if running Microsoft® Windows® 2000 or another operating system compliant with the APCI specification. When **Power Button Override** is set to **Enabled**, you cannot use the power button to turn off the system or perform other system events.

  NOTE: You can still turn a system on using the power button, even if its **Power Button Override** option is disabled.

Exit Screen

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

- **Save Changes and Exit**
- **Discard Changes and Exit**
- **Return to Setup**

Using the System Password Feature

NOTICE: The password features provide a basic level of security for the data on your system. However, they are not foolproof. If your data requires more security, it is your responsibility to obtain and use additional forms of protection, such as data encryption programs.

Your system is shipped to you without the system password feature enabled. If system security is a concern, you should operate your system only with system password protection.

You can assign a system password whenever you use the System Setup program. After a system password is assigned, only those who know the password have full use of the system.

When the **System Password** option is set to **Enabled**, the system prompts you for the system password just after the system starts.

To change an existing system password, you must know the password (see "Deleting or Changing an Existing System Password"). If you assign and later forget a system password, a trained service technician must remove the system cover to change a jumper setting that disables the system password feature (see "Disabling a Forgotten Password"). Note that this erases the setup password at the same time.

NOTICE: If you leave your system running and unattended without having a system password assigned or if you leave your system unlocked so that someone can disable the password by changing a jumper setting, anyone can access the data stored on your hard drive.

Assigning a System Password

Before you can assign a system password, you must enter the System Setup program and check the **System Password** option.

When a system password is assigned, the setting shown for the **System Password** option is **Enabled**. If the P**assword Status** option is **Unlocked**, you can change the system password. If the **Password Status** option is **Locked**, you cannot change the system password. When the system password feature is disabled by a jumper setting on the system board, the setting shown is **Disabled**, and you cannot change or enter a new system password.

When no system password is assigned and the password jumper on the system board is in the enabled (default) position, the setting shown for the **System Password** option is **Not Enabled** and the **Password Status** field is **Unlocked**. To assign a system password, use the following procedure:

1. Verify that the **Password Status** option is set to **Unlocked**.
2. Highlight the **System Password** option and then press <Enter>.
3. Type your new system password.

   You can use up to 32 characters in your password.

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

   The password assignment operation recognizes keys by their location on the keyboard without distinguishing between lowercase and uppercase characters. For example, if you have an *M* in your password, the system recognizes either *M* or *m* as correct. Certain key combinations are not valid. If you enter one of these combinations, the speaker emits a beep. To erase a character when entering your password, press the <Backspace> key or the left-arrow key.

   NOTE: To escape from the field without assigning a system password, press <Enter> to move to another field, or press <Esc> at any time prior to completing step 5.

4. Press <Enter>.
5. To confirm your password, type it a second time and press <Enter>.

   The **System Password** option changes to **Enabled**. Your system password is now set. You can exit the System Setup program and begin using your system.

   NOTE: Password protection does not take effect until you restart the system by turning the system off and then on again.

Using Your System Password to Secure Your System

Whenever you turn on or reboot your system by pressing the <Ctrl><Alt><Del> key combination, the following prompt appears on the screen when the **Password Status** option is set to **Unlocked**:

```
Type in the password and... -- press <ENTER> to leave password security enabled. -- press <CTRL><ENTER> to disable password security. Enter password:
```

If the **Password Status** option is set to **Locked**, the following prompt appears:

```
Type the password and press <Enter>.
```

After you type the correct system password and press <Enter>, your system completes the startup sequence and you can use the keyboard or mouse to operate your system as usual.

NOTE: If you have assigned a setup password (see "Using the Setup Password Feature"), the system accepts your setup password as an alternate system password.

If a wrong or incomplete system password is entered, the following message appears:

```
** Incorrect password. **

Enter password:
```

If an incorrect or incomplete system password is entered again, the same message appears.

The third and subsequent times an incorrect or incomplete system password is entered, the system displays the following message:

```
** Incorrect password. **
Number of unsuccessful password attempts: 3
System halted! Must power down.
```

The number of unsuccessful attempts made to enter the correct system password can alert you to an unauthorized person attempting to use your system.

Even after your system is turned off and on, the previous message is displayed each time an incorrect or incomplete system password is entered.

NOTE: You can use the **Password Status** option in conjunction with the **System Password** and **Setup Password** options to further protect your system from unauthorized changes.

Deleting or Changing an Existing System Password

1. When prompted, press <Ctrl><Enter> to disable the existing system password, instead of pressing <Enter> to continue with the normal operation of your system.

   If you are asked to enter your setup password, you may need to contact your network administrator who has the setup password.

2. Enter the System Setup program by pressing <F2> during POST.
3. Select the **System Security** screen field to verify that the **Password Status** option is set to **Unlocked**.
4. When prompted, type the system password.
5. Confirm that **Not Enabled** is displayed for the **System Password** option.

   If **Not Enabled** is displayed for the **System Password** option, the system password has been deleted. If you want to assign a new password, continue to step 6. If **Not Enabled** is not displayed for the **System Password** option, press the <Alt><b> key combination to restart the system, and then repeat steps 2 through 6.

6. To assign a new password, follow the procedure in "Assigning a System Password."

Using the Setup Password Feature

Your system is shipped to you without the setup password feature enabled. If system security is a concern, you should operate your system with the setup password feature enabled.

You can assign a setup password whenever you use the System Setup program. After a setup password is assigned, only those who know the password have full use of the System Setup program.

To change an existing setup password, you must know the setup password (see "Deleting or Changing an Existing Setup Password"). If you assign and later forget a setup password, you cannot operate your system or change settings in the System Setup program until a trained service technician opens the system chassis, changes the password jumper setting to disable the passwords, and erases the existing passwords. This procedure is described in the *Installation and Troubleshooting Guide*.

Assigning a Setup Password

A setup password can be assigned (or changed) only when the **Setup Password** option is set to **Not Enabled**. To assign a setup password, highlight the **Setup Password** option and press the left- or right-arrow key. The system prompts you to enter and verify the password. If a character is illegal for password use, the system emits a beep.

NOTE: The setup password can be the same as the system password. If the two passwords are different, the setup password can be used as an alternate system password. However, the system password cannot be used in place of the setup password.

After you verify the password, the **Setup Password** setting changes to **Enabled**. The next time you enter the System Setup program, the system prompts you for the setup password.

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

Operating With a Setup Password Enabled

If **Setup Password** is set to **Enabled**, you must enter the correct setup password before you can modify the majority of the System Setup options. When you start the System Setup program, the program prompts you to type the password.

If you do not enter the correct password in three tries, the system lets you view, but not modify, the System Setup screens—with the following exception. If **System Password** is not set to **Enabled** and is not locked via the **Password Status** option, you can assign a system password (however, you cannot disable or change an existing system password).

NOTE: You can use the **Password Status** option in conjunction with the **Setup Password** option to protect the system password from unauthorized changes.

Deleting or Changing an Existing Setup Password

To delete or change an existing setup password, perform the following steps:

1. Enter the System Setup program and select the **System Security** option.
2. Highlight the **Setup Password** option, press <Enter> to access the setup password window, and press <Enter> two more times to clear the existing setup password.

   The setting changes to **Not Enabled**.

3. If you want to assign a new setup password, perform the steps in "Assigning a Setup Password."

Disabling a Forgotten Password

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

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Glossary

Dell™ PowerEdge™ 1500SC Systems User's Guide

The following list defines or identifies technical terms, abbreviations, and acronyms used in your system 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 computer'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 cards, and SCSI adapters.

application program

Software, such as a spreadsheet or word processor, designed to help you perform a specific task or series of tasks. Application programs run from the operating system.

asset tag code

An individual code assigned to a system, usually by a system administrator, for security or tracking purposes.

backup

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

backup battery

The backup battery maintains system configuration, date, and time information in a special section of memory when the system is turned off.

beep code

A diagnostic message in the form of a pattern of beeps from your system's speaker. For example, one beep, followed by a second beep, and then a burst of three beeps is beep code 1-1-3.

BIOS

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

- Communications between the microprocessor and peripheral devices, such as the keyboard and the video adapter
- 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 or by turning the system off and then back on.

bps

Abbreviation for bits per second.

BTU

Abbreviation for British thermal unit.

bus

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 microprocessor and RAM.

byte

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

C

Abbreviation for Celsius.

cache

A fast storage area that keeps a copy of data or instructions for quicker data retrieval. 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

The metal-contact section on the bottom of an expansion card that plugs into an expansion-card connector.

CD

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

COMn

The device names for the first through fourth serial ports on your system are COM1, COM2, COM3, and COM4. The default interrupt for COM1 and COM3 is IRQ4, and the default interrupt for COM2 and COM4 is IRQ3. Therefore, you must be careful when configuring software that runs a serial device so that you don't create an interrupt conflict.

component

As they relate to DMI, manageable components are operating systems, computer systems, expansion cards, and peripherals that are compatible with DMI. Each component is made up of groups and attributes that are defined as relevant to that component.

controller

A chip that controls the transfer of data between the microprocessor and memory or between the micro-processor and a peripheral device such as a disk drive or the keyboard.

control panel

The part of the system that contains indicators and controls, such as the power switch, hard drive access indicator, and power indicator.

conventional memory

The first 640 KB of RAM. Conventional memory is found in all systems. Unless they are specially designed, MS-DOS® programs are limited to running in conventional memory.

coprocessor

A chip that relieves the system's microprocessor of specific processing tasks. A math coprocessor, for example, handles numeric processing. A graphics coprocessor handles video rendering.

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.

DDR

Abbreviation for double data rate.

device driver

A program that allows the operating system or some other program to interface correctly with a peripheral device, such as a printer. Some device drivers—such as network drivers—must be loaded as memory-resident programs. Others—such as video drivers—must load when you start the program for which they were designed.

Diagnostics

A comprehensive set of tests for your system. Refer to your *Installation and Troubleshooting Guide* for more information about using diagnostics.

DIMM

Acronym for dual in-line memory module. A small circuit board containing DRAM chips that connects to the system board.

DIN

Acronym for *Deutsche Industrie Norm*.

DIP

Acronym for dual in-line package. A circuit board, such as a system board or expansion card, may contain DIP switches for configuring the circuit board. DIP switches are always toggle switches, with an ON position and an OFF position.

directory

Directories help keep related files organized on a disk in a hierarchical, "inverted tree" structure. Each disk has a "root" directory; for example, a c:\> prompt normally indicates that you are at the root directory of hard drive C. Additional directories that branch off the root directory are called *subdirectories*. Subdirectories may contain additional directories branching off them.

DMA

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

DMI

Abbreviation for Desktop Management Interface. DMI enables the management of your system's software and hardware. DMI collects information about the system's components, such as the operating system, memory, peripherals, expansion cards, and asset tag.

DPMS

Abbreviation for Display Power Management Signaling. A standard that defines the hardware signals sent by a video controller to activate power management states in a monitor. A monitor is said to be DPMS-compliant when it is designed to enter a power management state after receiving the appropriate signal from a system's video controller.

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 microprocessor in the system.

drive-type number

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

DTE

Abbreviation for data terminal equipment. Any device, such as a system, that can send data in digital form by means of a cable or communications line. The DTE is connected to the cable or communications line through a data communications equipment (DCE) device, such as a modem.

DVD

Abbreviation for digital video disc. A read-only optical storage device that has greater capacity and bandwidth than CD. You can use DVD for multimedia and data storage.

ECC

Abbreviation for error checking and correction.

ECP

Abbreviation for Extended Capabilities Port.

EEPROM

Acronym for electrically erasable programmable read-only memory.

EIDE

Abbreviation for enhanced integrated drive electronics. EIDE devices add one or more of the following enhancements to the traditional IDE standard:

- Data transfer rates of up to 16 MB/sec
- Support for drives other than just hard drives, such as CD and tape drives
- Support for hard drives with capacities greater than 528 MB
- Support for up to two controllers, each with up to two devices attached

EMC

Abbreviation for Electromagnetic Compatibility.

EMI

Abbreviation for electromagnetic interference.

EMM

Abbreviation for expanded memory manager. A utility that uses extended memory to emulate expanded memory on systems.

EMS

Abbreviation for Expanded Memory Specification.

EPROM

Acronym for erasable programmable read-only memory.

ESD

Abbreviation for electrostatic discharge.

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.

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 board or riser board for plugging in an expansion card.

extended memory

RAM above 1 MB. Most software that can use it, such as the Microsoft® Windows® operating system, requires that extended memory be under the control of an 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.

F

Abbreviation for Fahrenheit.

FAT

Acronym for file allocation table. The file system structure used by MS-DOS to organize and keep track of file storage. Some other operating systems can optionally use a FAT file system structure.

FCC

Abbreviation for Federal Communications Commission.

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 drive or diskette for storing files. An unconditional format deletes all data stored on the disk.

ft

Abbreviation for feet.

FTP

Abbreviation for file transfer protocol.

g

Abbreviation for gram(s).

G

Abbreviation for gravities.

GB

Abbreviation for gigabyte(s). A gigabyte equals 1,024 megabytes or 1,073,741,824 bytes.

graphics coprocessor

See **coprocessor**.

graphics mode

A video mode that can be defined as *x* horizontal by *y* vertical pixels by *z* colors.

group

As it relates to DMI, a group is a data structure that defines common information, or attributes, about a manageable component.

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*.

heat sink

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

host adapter

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

Hz

Abbreviation for hertz.

ICES

Abbreviation for Interface-Causing Equipment Standard (in Canada).

ID

Abbreviation for identification.

IDE

integrated drive electronics

I/O

Abbreviation for input/output. A keyboard is an input device, and a printer is an output device. 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 output activity; when the program sorts a list of terms, it is engaging in computational activity.

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.

interleaving

A technique for storing data more efficiently by arranging parts of one sequence of data so they alternate with parts of another sequence of the same data. When the data is retrieved, the system puts the sequence back together again.

internal microprocessor cache

An instruction and data cache built in to the microprocessor. The Intel Pentium microprocessor 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.

IPX

Acronym for internetwork packet exchange.

IRQ

Abbreviation for interrupt request. A signal that data is about to be sent to or received by a peripheral device 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.

ITE

Abbreviation for information technology equipment.

jumper

Jumpers are small blocks on a circuit board with two or more pins emerging from them. Plastic plugs containing a wire fit down over the pins. The wire connects the pins and creates a circuit. Jumpers provide a simple and reversible method of changing the circuitry in a printed circuit board.

K

Abbreviation for kilo-, indicating 1,000.

KB

Abbreviation for kilobyte(s), 1,024 bytes.

KB/sec

Abbreviation for kilobyte(s) per second.

Kbit(s)

Abbreviation for kilobit(s), 1,024 bits.

Kbit(s)/sec

Abbreviation for kilobit(s) per second.

key combination

A command requiring you to 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), 1,000 grams.

kHz

Abbreviation for kilohertz, 1,000 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.

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

m

Abbreviation for meter(s).

mA

Abbreviation for milliampere(s).

mAh

Abbreviation for milliampere-hour(s).

math coprocessor

See **coprocessor**.

Mb

Abbreviation for megabit.

MB

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

MB/sec

Abbreviation for megabytes per second.

Mbps

Abbreviation for megabits per second.

MBR

Abbreviation for master boot record.

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 16 MB of memory" refers to a system with 16 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.

memory module

A small circuit board containing DRAM chips that connects to the system board.

MHz

Abbreviation for megahertz.

microprocessor

The primary computational chip inside the system that controls the interpretation and execution of arithmetic and logic functions. Software written for one microprocessor must usually be revised to run on another microprocessor. *CPU* is a synonym for microprocessor.

MIDI

Abbreviation for musical instrument digital interface.

MIF

Acronym for management information format. A MIF file contains information, status, and links to component instrumentation. MIF files are installed into the MIF database by the DMI service layer. The content of a MIF is defined by a DTMF working committee and is published in the form of a MIF definition document. This document identifies the groups and attributes that are relevant to DMI-manageable components.

mm

Abbreviation for millimeter(s).

modem

A device that allows your system to communicate with other systems over telephone lines.

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.

MPEG

Acronym for Motion Picture Experts Group. MPEG is a digital video file format.

ms

Abbreviation for millisecond(s).

MTBF

Abbreviation for mean time between failures.

multifrequency monitor

A monitor that supports several video standards. A multifrequency monitor can adjust to the frequency range of the signal from a variety of video adapters.

mV

Abbreviation for millivolt(s).

NDIS

Abbreviation for Network Driver Interface Specification.

NIC

Acronym for network interface controller.

NLM

Abbreviation for NetWare® Loadable Module.

NMI

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

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.

NTFS

Abbreviation for the NT File System option in the Windows NT® operating system.

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 configuration information.

online access service

A service that typically provides access to the Internet, e-mail, bulletin boards, chat rooms, and file libraries.

OTP

Abbreviation for one-time programmable.

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

A feature of the operating system that allows you to divide a hard drive into multiple physical sections called *partitions*. Each partition can contain multiple logical drives.

PCI

Abbreviation for Peripheral Component Interconnect. A standard for local-bus implementation.

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

A single point on a video display. Pixels are arranged in rows and columns to create an image. A video resolution, such as 640 x 480, is expressed as the number of pixels across by the number of pixels up and down.

Plug and Play

An industry-standard specification that makes it easier to add hardware devices to personal systems. Plug and Play provides automatic installation and configuration, compatibility with existing hardware, and dynamic support of mobile computing environments.

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.

PQFP

Abbreviation for plastic quad flat pack, a type of microprocessor socket in which the microprocessor chip is permanently mounted.

protected mode

An operating mode supported by 80286 or higher microprocessors, protected mode allows operating systems to implement:

- A memory address space of 16 MB (80286 microprocessor) to 4 GB (Intel386 or higher microprocessor)
- Multitasking
- Virtual memory, a method for increasing addressable memory by using the hard drive

Many 32-bit operating systems run in protected mode. MS-DOS cannot run in protected mode; however, some programs that you can start from MS-DOS, such as the Windows operating system, are able to put the system into protected mode.

PS/2

Abbreviation for Personal System/2.

PXE

Acronym for preboot execution environment.

RAID

Acronym for redundant array of independent disks.

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.

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

readme file

A text file included with a software package or hardware product that contains information supplementing or updating the documentation for the software or hardware. Typically, readme files provide installation information, describe new product enhancements or corrections that have not yet been documented, and list known problems or other things you need to be aware of as you use the software or hardware.

real mode

An operating mode supported by 80286 or higher microprocessors, real mode imitates the architecture of an 8086 microprocessor.

refresh rate

The rate at which the monitor redraws the video image on the monitor screen. More precisely, the refresh rate is the frequency, measured in Hz, at which the screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye. The higher refresh rates are also noninterlaced.

RFI

Abbreviation for radio frequency interference.

RGB

Abbreviation for red/green/blue.

ROM

Acronym for read-only memory. Your system contains some programs essential to its operation in ROM code. Unlike RAM, a ROM chip retains its contents even after you turn off your system. Examples of code in ROM include the program that initiates your system's boot routine and the POST.

rpm

Abbreviation for revolutions per minute.

RTC

Abbreviation for real-time clock. Battery-powered clock circuitry inside the system that keeps the date and time after you turn off the system.

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 (15 for some newer SCSI types) to one SCSI interface.

SDMS

Abbreviation for SCSI device management system.

SDRAM

Acronym for synchronous dynamic random-access memory.

sec

Abbreviation for second(s).

SEC

Abbreviation for single-edge contact.

serial port

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

service tag number

A bar code label on the system that identifies it when you call Dell for customer or technical support.

shadowing

A computer's system and video BIOS code is usually stored on ROM chips. Shadowing refers to the performance-enhancement technique that copies BIOS code to faster RAM chips in the upper memory area (above 640 KB) during the boot routine.

SIMD

Abbreviation for Single Instruction Multiple Data.

SIMM

Acronym for single in-line memory module. A small circuit board containing DRAM chips that connects to the system board.

SMART

Acronym for Self-Monitoring Analysis and Reporting Technology. A technology that allows hard 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 drive and the proper support in the system BIOS.

SNMP

Abbreviation for Simple Network Management Protocol. SNMP is an industry-standard interface that allows a network manager to remotely monitor and manage workstations.

SRAM

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

SVGA

Abbreviation for super video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than 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 video memory installed in the system.

switch

On a system board, switches control various circuits or functions in your system. These switches are known as *DIP switches*; they are normally packaged in groups of two or more switches in a plastic case. Two common DIP switches are used on system boards: *slide switches* and *rocker switches*. The names of the switches are based on how the settings (on and off) of the switches are changed.

syntax

The rules that dictate how you must type a command or instruction so that the system understands it.

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
- Controllers for standard peripheral devices, such as the keyboard
- Various ROM chips

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

system configuration information

Data stored in memory that tells a system what hardware is installed and how the system should be configured for operation.

system diskette

System diskette is a synonym for *bootable diskette*.

system memory

System memory is a synonym for *RAM*.

System Setup program

A BIOS-based program that allows you to configure your system's hardware and customize the system's operation by setting such features as password protection and energy management. Some options in the System Setup program require that you reboot the system (or the system may reboot automatically) in order to make a hardware configuration change. Because the System Setup program is stored in NVRAM, any settings remain in effect until you change them again.

termination

Some devices (such as the last device at each end of a SCSI cable) must be terminated to prevent reflections and spurious signals in the cable. When such devices are connected in a series, you may need to enable or disable the termination on these devices by changing jumper or switch settings on the devices or by changing settings in the configuration software for the devices.

text editor

An application program for editing text files consisting exclusively of ASCII characters. Windows Notepad is a text editor, for example. Most word processors use proprietary file formats containing binary characters, although some can read and write text files.

text mode

A video mode that can be defined as *x* columns by *y* rows of characters.

time-out

A specified period of system inactivity that must occur before an energy conservation feature is activated.

tpi

Abbreviation for tracks per inch.

UL

Abbreviation for Underwriters Laboratories.

UMB

Abbreviation for upper memory blocks.

upper memory area

The 384 KB of RAM located between 640 KB and 1 MB. If the system has an Intel386 or higher microprocessor, a utility called a *memory manager* can create UMBs in the upper memory area, in which you can load device drivers and memory-resident programs.

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. A USB connector provides a single connection point for multiple USB-compliant devices, such as mice, keyboards, printers, and system speakers. USB devices can also be connected and disconnected while the system is running.

utility

A program used to manage system resources—memory, disk drives, or printers, for example.

UTP

Abbreviation for unshielded twisted pair.

V

Abbreviation for volt(s).

VAC

Abbreviation for volt(s) alternating current.

VCCI

Abbreviation for Voluntary Control Council for Interference.

VCR

Abbreviation for video cassette recorder.

VDC

Abbreviation for volt(s) direct current.

VESA

Acronym for Video Electronics Standards Association.

VGA

Abbreviation for video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than 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 video memory installed for the video adapter.

VGA feature connector

On some systems with a built-in 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—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 systems in a variety of video modes.

On some 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 often 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 for faster graphics rendering.

video driver

A program that allows graphics-mode application programs and operating systems to display at a chosen resolution with the desired number of colors. A software package may include some "generic" video drivers. Any additional video drivers may need to match the video adapter installed in the system.

video memory

Most VGA and SVGA video adapters include 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 capabilities).

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 displays in graphics modes that can be defined as *x* horizontal by *y* vertical pixels by *z* colors.

video resolution

Video resolution—800 x 600, 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.

virtual memory

A method for increasing addressable RAM by using the hard drive. For example, in a system with 16 MB of RAM and 16 MB of virtual memory set up on the hard drive, the operating system would manage the system as though it had 32 MB of physical RAM.

VLSI

Abbreviation for very-large-scale integration.

Vpp

Abbreviation for peak-point voltage.

VRAM

Abbreviation for video random-access memory. Some video adapters use VRAM chips (or a combination of VRAM and DRAM) to improve video performance.

VRAM is dual-ported, allowing the video adapter to update the screen and receive new image data at the same time.

W

Abbreviation for watt(s).

WH

Abbreviation for watt-hour(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 or by setting the write-protect feature in the System Setup program.

XMM

Abbreviation for extended memory manager, a utility that allows application programs and operating systems to use extended memory in accordance with the XMS.

XMS

Abbreviation for eXtended Memory Specification.

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.

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