Dell™ PowerEdge™ 1600SC Systems User's Guide

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

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

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

Technical Specifications
Dell™ PowerEdge™ 1600SC Systems User's Guide

Specifications

Microprocessor	
Microprocessor type	up to two Intel® Xeon™ microprocessors with a speed of at least 1.8 GHz
Front-side bus speed	at least 400 MHz
Internal cache	512-KB level 2 cache

Expansion Bus	
Bus type	PCI and PCI-X
Expansion slots	two 32-bit, 33-MHz PCI slots (5 V); two 64-bit, 66-MHz PCI slots (3.3 V); two 64-bit, 100-MHz PCI-X slots (3.3 V)

Memory	
Architecture	72-bit ECC registered DDR 266 SDRAM
Memory module sockets	four
Memory module capacities	128, 256, 512 MB, or 1 GB
Minimum memory capacity	128 MB
Maximum memory capacity	4 GB

Drives	
Diskette drive	3.5-inch, 1.44-MB diskette drive
Hard drives	up to six 1-inch hot-plug Ultra3 SCSI drives, up to four 1-inch non-hot-plug Ultra3 SCSI drives, or up to four 1-inch non-hot-plug IDE drives
CD drive	one EIDE CD drive
Optional DVD or combination drive	optional IDE DVD or combination drive
Tape drive	optional internal SCSI or IDE tape backup unit

Externally Accessible Ports and Connectors	
Serial	one 9-pin connector
Parallel	25-pin connector
Video	15-pin connector
PS/2-style keyboard (with USB support)	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
USB	two USB-compliant 4-pin connectors
NIC	RJ45 connector for integrated NIC

Video	
Video type	ATI Rage XL video controller; VGA connector
Video memory	8 MB

Power	

DC power supply (per power supply):

Wattage	450 W
Voltage	100–240 VAC, 50–60 Hz
Heat dissipation	2275 BTU/hr maximum
Output hold up time	20 ms minimum
Maximum inrush current	Under typical line conditions and over the entire system ambient operating range, the inrush current may reach 55 A at 10 ms or less or 25 A at 150 ms or less.
System battery	CR2032 3.0-V lithium coin cell

Physical	
Height	44.7 cm (17.6 inches)
Width	21.8 cm (8.6 inches)
Depth	57.41 cm (22.6 inches)
Weight	30.4 kg (67 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 36 G for up to 2.6 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 3048 m (–50 to 10,000 ft)
Storage	–16 to 10,668 m (–50 to 35,000 ft)
NOTE: For the full name of an abbreviation or acronym used in this table, see the "Glossary."	

Using Console Redirection

Dell™ PowerEdge™ 1600SC Systems User's Guide

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

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

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

Hardware Requirements

- An available serial (COM) port on the host system (COM1)
- An available serial (COM) port on a client system

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

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

Software Requirements

- VT 100/220 or ANSI terminal emulation with a window size of 80 x 25 characters
- 9600, 19.2 K, 57.6 K, or 115.2 K bps using serial (COM) ports
- Ability to create keyboard command macros (recommended)

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

Configuring the Host System

Configure console redirection on the host (local) system through the System Setup program (see "Using the System Setup Program"). The **Console Redirection** screen allows you to enable or disable the console redirection feature, select the remote terminal type, and enable or disable console redirection after booting.

Configuring the Client System

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

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

Configuring the Serial Port

1. Click the **Start** button, point to **Programs→ Accessories→ Communications**, and then click **HyperTerminal**.

2. Enter a name for the new connection, select an icon, and then click **OK**.

3. From the **Connect to** drop-down menu, select an available COM port, and then click **OK**.

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

4. Configure the port with the following settings:

   l Set **Bits per second**.

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

   l Set **Data bits** to **8**.

   l Set **Parity** to **None**.

   l Set **Stop bits** to **1**.

   l Set **Flow control** to **Hardware**.

5. Click **OK**.

Configuring the Terminal Settings

1. In HyperTerminal, click **File**, click **Properties**, and then click the **Settings** tab.

2. Ensure that the **Function, arrow, and Ctrl keys act as** field is set to **Terminal Keys**.

3. Ensure that the **Backspace key sends** field is set to **Ctrl+H**.

4. Change the **Emulation** setting from **Auto detect** to **ANSI** or **VT 100/220**.

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

5. Click **Terminal Setup**.

   A setting for the number of rows and columns appears.

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

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

7. Click **OK** twice.

Managing the Host System Remotely

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

1. Reboot the host system using the client system.

   See "Configuring Special Key Functions" for instructions.

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

   l Enter the System Setup program

- Enter the SCSI setup menus

- Update firmware and BIOS (flash the system)

- Run utilities on the utility partition

NOTE: To run utilities on the host system's utility partition, you must have created the utility partition using Dell OpenManage™ Server Assistant version 6.3.1 or later.

Configuring Special Key Functions

Console redirection uses ANSI or VT 100/220 terminal emulation, which is limited to basic ASCII characters. Function keys, arrow keys, and control keys are not available in the ASCII character set, and most utilities require function keys and control keys for ordinary operations. However, you can emulate a function key or control key using a special key sequence, called an escape sequence.

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

Table B-1 lists the escape sequences that represent a special key or function.

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

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

Table B-1. Supported Escape Sequences

Key(s)	Supported Sequence	Terminal Emulation
<Up arrow>	<Esc><[><A>	VT 100/220, ANSI
<Down arrow>	<Esc><[><B>	VT 100/220, ANSI
<Right arrow>	<Esc><[><C>	VT 100/220, ANSI
<Left arrow>	<Esc><[><D>	VT 100/220, ANSI
<F1>	<Esc><O><P>	VT 100/220, ANSI
<F2>	<Esc><O><Q>	VT 100/220, ANSI
<F3>	<Esc><O><R>	VT 100/220, ANSI
<F4>	<Esc><O><S>	VT 100/220, ANSI
<F5>	<Esc><O><T>	VT 100, ANSI
<F6>	<Esc><O><U>	VT 100, ANSI
	<Esc><[><1><7><~>	VT 100/220
<F7>	<Esc><O><V>	VT 100, ANSI
	<Esc><[><1><8><~>	VT 100/220
<F8>	<Esc><O><W>	VT 100, ANSI
	<Esc><[><1><9><~>	VT 100/220
<F9>	<Esc><O><X>	VT 100, ANSI
	<Esc><[><2><0><~>	VT 100/220
<F10>	<Esc><O><Y>	VT 100, ANSI
	<Esc><[><2><1><~>	VT 100/220
<F11>	<Esc><O><Z>	VT 100, ANSI
	<Esc><[><2><3><~>	VT 100/220
<F12>	<Esc><O><A>	VT 100, ANSI
	<Esc><[><2><4><~>	VT 100/220
<Home>	<Esc><[><1><~>	VT 220
<End>	<Esc><[><4><~>	VT 220
<Insert>	<Esc><[><2><~>	VT 220
<Delete>	<Esc><[><3><~>	VT 220
<Page Up>	<Esc><[><5><~>	VT 220
<Page Down>	<Esc><[><6><~>	VT 220

| <Shift><Tab> | <Esc><[><Z> | VT 100 |
| | <Esc><[><0><Z> | VT 220 |

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

Additional escape sequences may be required by certain utilities or functions on the host system. Create macros for the additional sequences listed in Table B-2.

NOTE: Escape-sequence key combinations listed in Table B-2 are case-sensitive. For example, to generate the character <A> you must press <Shift><a>.

Table B-2. Additional Escape Sequences

Key(s)	Supported Sequence
<Ctrl><Alt><Del> (Reboot host system)	<Esc><R><Esc><r><Esc><R>
<Alt><x>	<Esc><X><X>
<Ctrl><H>	<Esc><Ctrl><H>
<Ctrl><I>	<Esc><Ctrl><I>
<Ctrl><J>	<Esc><Ctrl><J>
<Ctrl><M>	<Esc><Ctrl><M>
<Ctrl><2>	<Esc><Ctrl><2>

Back to Contents Page

Dell™ PowerEdge™ 1600SC Systems User's Guide

Dell™ PowerEdge™ 1600SC Systems User's Guide

System Overview

Dell™ PowerEdge™ 1600SC Systems User's Guide

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

Your system provides a reliable platform for both large and small environments, including small-business and remote-site environments. This section describes the major hardware and software features of your system, including front- and back-panel indicators, and provides information about connecting external devices to the system and using power protection devices. It also lists other documents you may need to install and operate your system, as well as how to obtain technical assistance.

Front Bezel Features and Indicators

Figure 1-1 shows the system's front bezel and identifies features and indicators located on the front bezel. Figure 1-2 illustrates how to open the front bezel to access the front panel.

Figure 1-1. Front Bezel Features and Indicators
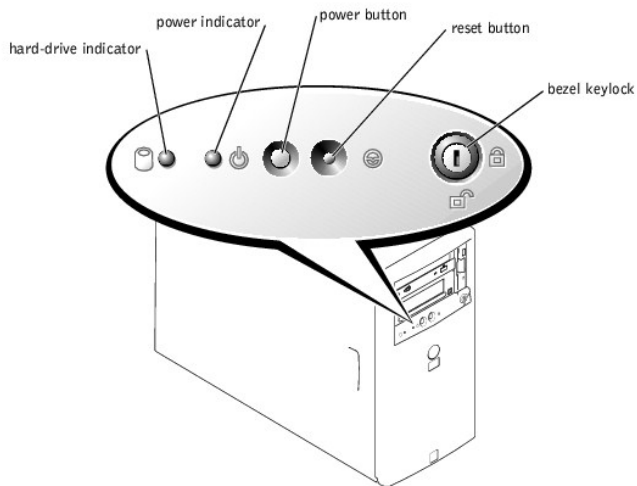
Figure 1-2. Opening the Front Bezel

latch

keylock

bezel
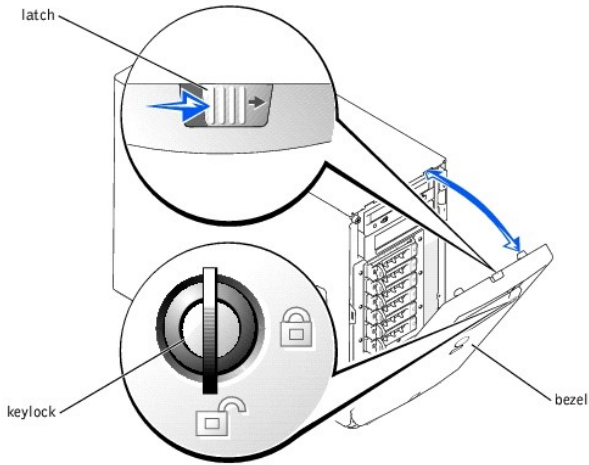
Front-Panel Features

shows the front-panel features for a system with non-hot-plug SCSI or IDE hard drives. shows the front-panel features for a system with hot-plug SCSI hard drives.

Figure 1-3. System With Non-Hot-Plug Hard Drives

CD drive (or optional DVD or combination drive)

diskette drive

peripheral bay

up to four non-hot-plug SCSI or IDE hard drives (behind faceplate)
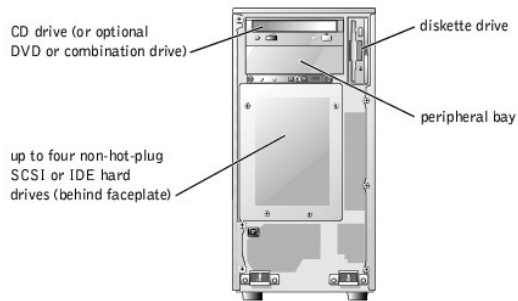
Figure 1-4. System With Hot-Plug SCSI Hard Drives

CD drive (or optional DVD or combination drive)

diskette drive

peripheral bay

up to six hot-plug SCSI hard drives
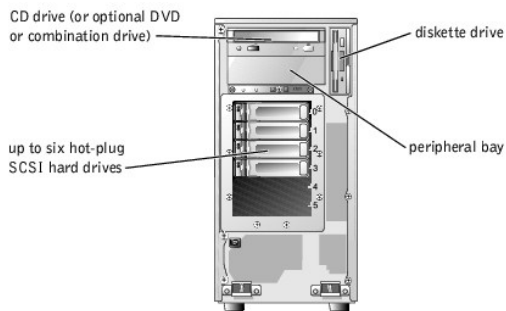
Back-Panel Features

shows the back-panel features of the system.

shows a system with optional redundant AC power supplies installed.

Figure 1-5. Back-Panel Features
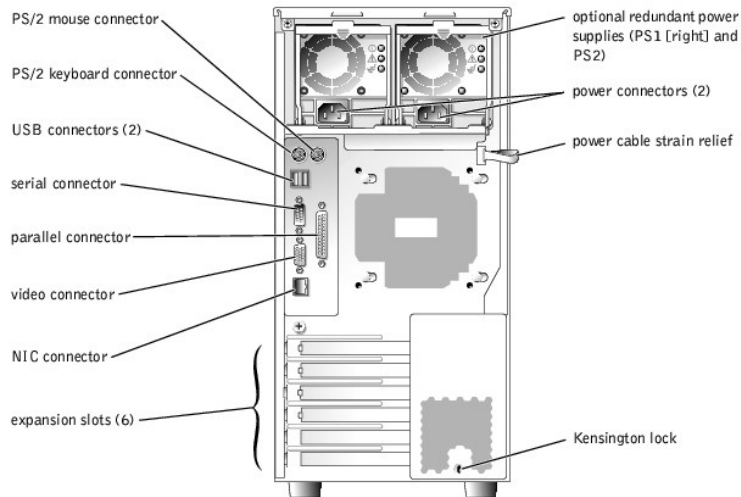
Connecting External Devices

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

l Most devices must be connected to a specific connector and device drivers must be installed before the device will operate properly. (Device drivers are normally included with your operating system software or with the device itself.) Check the documentation that accompanied the device for specific installation and configuration instructions.

l Always attach external devices while your system is turned off. Then turn on any external devices before turning on the system (unless the documentation for the device specifies otherwise). If the system does not appear to recognize the device, try turning on the system before turning on the device.

For information about individual connectors, see "I/O Ports and Connectors" in your *Installation and Troubleshooting Guide.* For information about enabling, disabling, and configuring I/O ports and connectors, see "Using the System Setup Program."

System Features

Your system offers the following features:

l Up to two Intel® Xeon™ microprocessors with a speed of at least 1.8 GHz, a front side bus speed of at least 400 MHz, and a 512-KB Level 2 cache

NOTE: Use the System Setup program to view microprocessor information. For more information, see "Using the System Setup Program."

l A minimum of 128 MB of ECC DDR 266 SDRAM memory, upgradable to a maximum of 4 GB by installing 128-, 256-, 512-MB, or 1-GB registered memory modules in the four memory module sockets on the system board

l Support for the following internal hard-drive configurations:

    o Up to six 1-inch Ultra3 SCSI hot-plug hard drives

    o Up to four 1-inch non-hot-plug SCSI or IDE hard drives

l Integrated SCSI controller for SCSI hard drives and integrated IDE controller for IDE hard drives, CD drive, and optional DVD and combination drives

- Optional single-channel RAID controller for SCSI RAID or optional quad-channel RAID controller for IDE RAID

- Two 5.25-inch peripheral drive bays that supports the following optional drives: CD, DVD, combination CD/DVD, or tape backup unit (SCSI or IDE)

The system board includes the following built-in features:

- Six PCI expansion slots: two 32-bit, 33-MHz PCI slots; two 64-bit, 66-MHz PCI slots; two 64-bit, 100-MHz PCI-X slots.

- An integrated VGA-compatible video subsystem with an ATI RAGE XL video controller. This video subsystem contains 8 MB of SDRAM video memory (nonupgradable). Maximum resolution is 1280 x 1024 pixels and 16.7 million colors (noninterlaced).

- An integrated Gigabit Ethernet NIC, capable of supporting 10-Mbps, 100-Mbps, and 1000-Mbps data rates.

- Systems management circuitry that monitors critical system voltages and temperatures. The systems management circuitry works in conjunction with the systems management software.

- Optional remote access card for remote systems management.

- Optional hot-plug redundant power supplies.

- Chassis intrusion alarm, padlock tabs for internal security, and a bezel lock that prevents access to the hot-plug hard drives.

Standard systems include a diskette drive and IDE CD drive, installed in an externally accessible bay. An optional DVD or combination drive is also available.

The following software is included with your system:

- The 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 system password and a setup 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.*

- Optional tape backup software.

For a list of documents that provide more information on your system's features, see "Other Documents You May Need."

Supported Operating Systems

Your system supports the following operating systems:

- Microsoft® Windows® Server 2003 Standard Edition

- Microsoft Windows 2000 Server

- Microsoft Windows 2000 SBS

- Red Hat® Linux 7.3 or later

- Novell® NetWare® version 6.0 or later

Power Protection Devices

Certain devices protect your system from the effects of problems such as power surges and power failures.

- PDU — Uses circuit breakers to ensure that the AC current load does not exceed the PDU's rating.

- Surge protector — Prevents voltage spikes, such as those that may occur during an electrical storm, from entering the system through the electrical outlet and network port. They do not protect against brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.

- Line conditioner — Maintains a system's AC power source voltage at a moderately constant level and provides protection from brownouts, but does not protect against a complete power loss.

- UPS — Uses battery power to keep the system running when AC power is unavailable. The battery is charged by AC power while it is available so that after AC power is lost, the battery can provide power to the system for a limited amount of time—from 15 minutes to approximately an hour. A UPS that provides only 5 minutes of battery power allows you to shutdown the system. Use surge protectors and PDUs with all universal power supplies, and ensure that the UPS is UL-safety approved.

Other Documents You May Need

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

- The *Setting Up Your System* document provides an overview of initially setting up your system.

- The *Installation and Troubleshooting Guide* describes how to troubleshoot the system and install or replace system components.

- Systems management software documentation describes the features, requirements, installation, and basic operation of the software.

- Operating system documentation describes how to install (if necessary), configure, and use the operating system software.

- Other documentation included on the CDs that came with your system describes the use of advanced system features.

- Documentation for any components you purchased separately provides information to configure and install these options.

- Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.

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

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

Obtaining Technical Assistance

If you do not understand a procedure in this guide or if the system does not perform as expected, see your *Installation and Troubleshooting Guide*.

Dell Enterprise Training and Certification is available now; see **www.dell.com/training** for more information. This service may not be offered in all locations.

Using the Dell OpenManage Server Assistant CD

Dell™ PowerEdge™ 1600SC Systems User's Guide

- Option
- Description
- Starting the Server Assistant CD
- Using the Server Setup Program
- Updating Drivers and Utilities
- Using the Utility Partition

The *Dell OpenManage Server Assistant* CD contains utilities, diagnostics, and drivers to help you configure your system. You begin operating system installation with this CD if your operating system is not preinstalled on your system. A bootable utility partition on the system's hard drive contains some of the same functionality as the *Server Assistant* CD.

Starting the Server Assistant CD

To configure your system and install your operating system, insert the Server Assistant CD, and turn on or reboot the system. The **Dell OpenManage Server Assistant** main screen appears.

The *Server Assistant* CD uses a standard Web browser interface. You can navigate the CD by using the mouse to click various icons and text links.

Click the **Exit** icon to exit Server Assistant. If you exit Server Assistant while in the Server Setup program, the system reboots to the standard operating system boot partition.

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").

Using the Server Setup Program

If the operating system is not preinstalled or if you install an operating system at a later date, use the Server Setup program on the *Server Assistant* CD to configure your system and install your operating system.

> **NOTE:** Use the *Server Assistant* CD only if your operating system is not preinstalled on your system. Locate the operating system's *Installation Instructions* document and follow the instructions to complete the installation process.

The Server Setup program guides you through tasks such as the following:

- Setting the system date and time
- Configuring your RAID controller (if applicable)
- Selecting and installing your operating system; specifying operating system-specific information
- Configuring hard drives
- Viewing an installation summary

> **NOTE:** You must have your operating system media available to install your operating system.

To start the Server Setup program, click **Server Setup** on the **Dell OpenManage Server Assistant** main screen. Follow the instructions on the screen.

Updating Drivers and Utilities

You can update drivers and utilities on any system that has Microsoft® Internet Explorer 4.0 or later or Netscape Navigator 6.0 or later installed. When you insert the CD in a system that uses a Microsoft Windows®-based operating system, the system automatically starts the browser and displays the **Dell OpenManage Server Assistant** main screen.

To update drivers and utilities, perform the following steps:

1. From the **Dell OpenManage Server Assistant** main screen, select the option for updating drivers and utilities.

2. Select the system model number from the drop-down menu.

3. Select the type of drivers or utilities that you want to update.

4. Click **Continue**.

5. Select each driver or utility that you want to update.

    You are prompted to either run the program or provide for a location to save the files.

6. Run the program or specify the location to save the files.

Using the Utility Partition

The utility partition is a bootable partition on the hard drive that contains system configuration and diagnostic utilities. When you start the utility partition, it boots and provides an executable environment for the partition's utilities.

To start the utility partition, turn on or reboot the system. During POST, press <F10> when the following message appears:

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

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

The utility partition provides a text-based interface from which you can run the partition's utilities. To select a menu option, use either 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 **Utility Partition** main menu.

Table 2-1 provides a sample list and explanation of the options that appear on the utility partition menu. These options are available even when the *Server Assistant* CD is not in the CD drive.

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 configuration utility if a ROMB or RAID controller card is installed
NOTE: The options displayed may vary depending on your system configuration and may not include those listed here. For the full name of an abbreviation or acronym used in this table, see the "Glossary."	

Back to Contents Page

Using the System Setup Program

Dell™ PowerEdge™ 1600SC 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
- Asset Tag Utility

The System Setup program allows you to view or configure system and hardware device settings.

You can use the System Setup program to:

- Change the system configuration stored in NVRAM after you add, change, or remove hardware
- Change user-selectable options (for example, system time or date)
- Enable or disable integrated devices

After installing your system, run the System Setup program to familiarize yourself with the system configuration and optional settings. Print the System Setup screens (by pressing <Print Screen>), or record the information for later reference.

Entering the System Setup Program

Enter the System Setup program as follows:

1. Turn on or restart your system.

2. Press <F2> immediately when you see the following message:

   Press <F2> for System Setup

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

   If you wait too long to press a button, let the system finish booting and then restart the system.

   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>.

Responding to Error Messages

If an error message appears on the screen while the system is booting, make a note of the message. Then, before entering the System Setup program, see "System Beep Codes" and "System Messages" in your *Installation and Troubleshooting Guide* for an explanation of the message and suggestions for correcting any errors. (It is normal to receive an error message the first time you boot your system after installing a memory upgrade. In that situation, do not refer to "System Beep Codes" and "System Messages." Instead, follow the instructions for performing a memory upgrade in "Performing a Memory Upgrade" 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 the <F2> key.

Using the System Setup Program

Table 3-1 lists the keys used 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 <Tab><Shift>	Moves to the previous field.
Left or right arrow	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.

For most of the options, any changes you make are recorded but do not take effect until the next time you boot the system. For a few options (as noted in the help area), the changes take effect immediately.

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). Fields that have no user-selectable settings are displayed in blue on the screen.

NOTE: The System Setup screen may vary from Figure 3-1 if optional hardware is installed in your system.

Figure 3-1. Main System Setup Screen

```
        Dell Computer Corporation (www.dell.com) - PowerEdge 1600SC

  Intel® Pentium® Xeon™ Processor:        BIOS Version: XXX
  Processor Speed: XXXX MHz               Service Tag : XXXXX


  System Time  .......................................08:15:45
  System Date  .......................................Mon May 19, 2002

  Diskette Drive A: ..................................3.5 inch, 1.44 MB

  System Memory  .....................................128 MB ECC DDR
  Video Memory  ......................................8 MB
  OS Install Mode ....................................OFF
  CPU Information  ...................................<ENTER>

  Primary Drive 0 ....................................Hard Drive
  Primary Drive 1 ....................................Hard Drive
  Secondary Drive 0 ..................................CD-ROM
  Secondary Drive 1 ..................................Off

  Maximum UDMA Mode ..................................NONE

  Boot Sequence  .....................................<ENTER>
  Hard-Disk Drive Sequence ...........................<ENTER>

  Integrated Devices .................................<ENTER>
  PCI IRQ Assignment .................................<ENTER>

  System Security  ...................................<ENTER>
  Console Redirection ................................<ENTER>
  PCIX Slot Information...............................<ENTER>


  Keyboard NumLock  ..................................On
  Report Keyboard Errors .............................Report

  Asset Tag ..........................................XXXXX

  Up,Down Arrow to select  |  SPACE,+,- to change  |  ESC to exit  |  F1=HELP
```
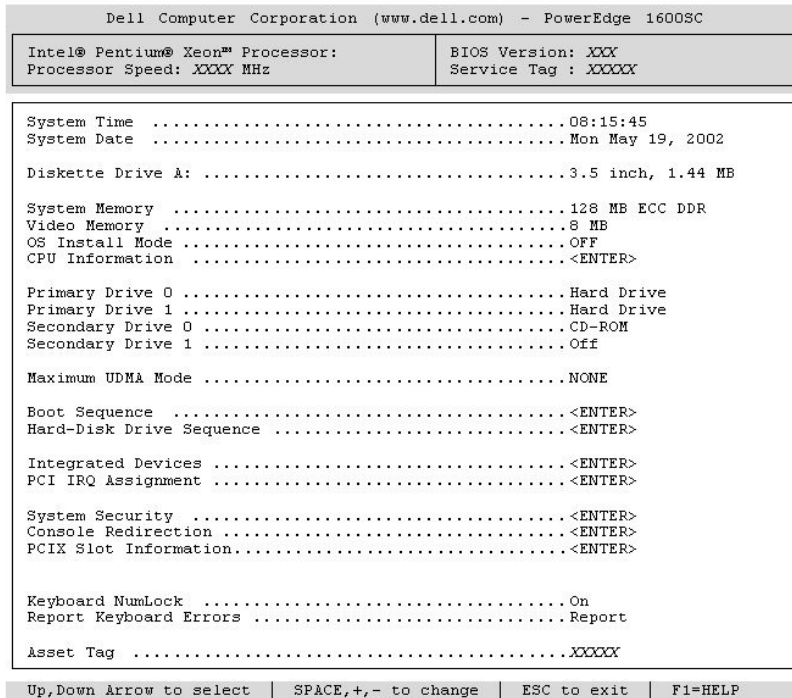
The following options and information fields appear on the main System Setup screen:

l **System Time** — Resets the time on the system's internal clock.

l **System Date** — Resets the date on the system's internal calendar.

l **Diskette Drive A:** — Identifies the type of diskette drive installed in the system.

l **System Memory** — Displays the amount of system memory; this option has no user-selectable settings.

l **Video Memory** — Displays the amount of video memory; this option has no user-selectable settings.

l **OS Install Mode** — Determines the maximum amount of memory available to the operating system. Some operating systems will not install with more than 2 GB of system memory. When set to **On**, the maximum memory available is 256 MB. When set to **Off** (default), all system memory is available to the operating system. Turn this option **On** during operating system installation and **Off** after installation.

l **CPU Information** — Displays information related to the system bus and microprocessors. Use the **Logical Processor** option to enable or disable Hyper-Threading technology.

The **CPU Information** option on the System Setup main screen displays information about the different processors in the system (speed, cache size, and so on). After you display the microprocessor information, you can enable or disable Hyper-Threading by changing the setting of the **Logical Processor** option. (The default is enabled.)

More information regarding Hyper-Threading can be found at **developer.intel.com**.

l **Primary Drive 0** — Identifies the type of IDE device attached as drive 0 on the primary IDE channel. Press <Enter> to display information about drive capacity, cylinders, heads, and sectors or to change the drive type.

l **Primary Drive 1**— Identifies the type of IDE device attached as drive 1 on the primary IDE channel. Press <Enter> to display information about drive capacity, cylinders, heads, and sectors or to change the drive type.

l **Secondary Drive 0** — Identifies the type of IDE device attached as drive 0 on the secondary IDE channel. Press <Enter> to display information about the device.

l **Secondary Drive 1** — Identifies the type of IDE device attached as drive 1 on the secondary IDE channel. Press <Enter> to display information about the device.

l **Maximum UDMA Mode** — Determines the speed at which the optional IDE hard drives will operate. Higher settings may improve performance. However, not all operating systems support the higher speeds without service-pack updates or patches applied.

l **Boot Sequence** — Displays the **Boot Sequence** screen, which allows you to configure the order in which the system searches for files required during the system startup. Available options include the diskette drive (default), CD drive (or optional DVD or combination drive), hard drive, or NIC (allowing PXE boot from the network). 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.

l **Hard-Disk Drive Sequence** — Displays the **Hard-Disk Drive Sequence** screen, which allows you to configure the order in which the system searches hard drives for files required during the 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.

l   **Integrated Devices —** Displays a screen that allows you to configure devices on the system board. See "Integrated Devices Screen."

l   **PCI IRQ Assignment —** Displays a screen that allows you to change the IRQ allocated to each of the integrated devices on the PCI bus or any installed expansion card requiring an IRQ.

l   **System Security —** Displays a screen that allows you to configure the system password and setup password features, chassis intrusion, and the power button. See "Using the System Password Feature" and "Using the Setup Password Feature."

l   **Console Redirection —** Displays a screen that allows you to configure console redirection. The submenu allows you to turn the feature on or off, select the remote terminal type, and enable or disable redirection after booting. For more information, see "Using Console Redirection."

l   **PCIX Slot Information —** Displays information about the system's PCI-X slots. This information can be used to determine the most appropriate slot to add a card for optimal performance.

l   **Keyboard Numlock —** Determines whether your system boots with the Num Lock mode activated on 101- or 102-key keyboards (this option does not apply to 84-key keyboards).

l   **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 to the keyboard controller during POST. This setting does not affect the operation of the keyboard itself if a keyboard is attached.

l   **Asset Tag —** Displays the customer-programmable 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."

Integrated Devices Screen

The following devices on the system board are configured through this screen:

l   **SCSI Controller —** Enables or disables the SCSI subsystem. The default is **On**.

l   **Diskette Controller —** Enables or disables the system's diskette drive controller. With **Auto** (default) selected, the system turns off the controller when necessary to accommodate a controller card installed in an expansion slot. With **Read Only** selected, diskettes can be read, but cannot be written to.

l   **IDE Controller —** Enables or disables the IDE controllers.

l   **USB Controller —** Sets the USB controller status to **On with BIOS Support** (default), **On Without BIOS Support**, or **Off**. If you have a PS/2 keyboard attached, **On Without BIOS Support** disables BIOS USB support. If you do not have a PS/2 keyboard attached and select **On Without BIOS Support**, USB mice and keyboards function only during the boot process. When set to **On With BIOS Support**, USB mice and keyboards are controlled by the BIOS until an operating system driver is loaded.

l   **Network Interface Controller —** Determines whether the PXE system boot option is enabled. The available options are **Enabled with PXE** and **Enabled without PXE** (default).

l   **NIC MAC Address —** Displays the MAC address used by the integrated NIC. This field has no user-selectable settings.

l   **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 COM 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.

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

l   **Speaker —** Enables or disables the system speaker.

l   **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 port.

System Security Screen

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

l   **System Password —** Displays the current status of your system's password security feature and allows you to assign and verify a new password.

   NOTE: See "Using the System Password Feature" for instructions on assigning a system password and using or changing an existing system password. For more information on disabling a forgotten password, see your *Installation and Troubleshooting Guide*.

l   **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. For more information on disabling a forgotten password, see your *Installation and Troubleshooting Guide*.

l   **Password Status —** When **Setup Password** is set to **Enabled**, this option prevents 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** (default). 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.

l   **Chassis Intrusion —** Enables or disables the system's chassis intrusion detection feature. When this option is set to **Enabled-Silent**, chassis intrusions are detected, but no warning message is reported during system startup. When this option is set to **Enabled**, the field automatically shows **Detected** when the chassis cover is removed. To acknowledge an intrusion and arm the system for future security breaches, press any navigation key.

> **NOTE:** When a remote access card is installed in the system, the chassis intrusion function is controlled by the remote access card. Therefore, the BIOS does not detect chassis intrusion functionality or events.

l   **Power Button —** When this option is set to **Enabled**, you can use the power button to turn the system off (or shut down the system if you are using an operating system such as Microsoft® Windows® 2000 that is compliant with the ACPI specification). If this option is set to **Disabled**, you cannot use the power button to turn off the system.

Exit Screen

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

l   Save Changes and Exit

l   Discard Changes and Exit

l   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, if your data requires more security, you should 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 with system password protection.

You can assign a system password through the System Setup program. After a system password is assigned, only those with 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 boots.

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, you must remove the system cover to change a jumper setting that disables the system password feature. Note that changing the jumper setting also erases the setup password. For more information on disabling a forgotten password, see your *Installation and Troubleshooting Guide.*

> **NOTICE:** If you leave your system running and unattended without 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 for the **System Password** option is **Enabled**. When the system password feature is disabled by a jumper setting on the system board, the setting is **Disabled by Jumper**. You cannot change or enter a new system password if either of these settings is displayed.

When no system password is assigned and the password jumper on the system board is in the enabled position (its default), the setting shown for the **System Password** option is **Not Enabled**. You can assign a system password only when this option is set to **Not Enabled**, using the following procedure:

1.   Verify that the **Password Status** option is set to **Unlocked**.

2. Highlight the **System Password** option and then press the left- or right-arrow key.

3. Type your new system password.

    You can use up to seven 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 <Tab> or <Shift><Tab> to move to another field, or press <Esc> at any time prior to completing step 5.

4. Press <Enter>.

    If the new system password is less than seven characters, the whole field fills with placeholders. Then the option heading changes to **Verify Password**, followed by another empty seven-character field in square brackets.

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

    The password setting changes to **Enabled**. Your system password is now set; you can exit the System Setup program and begin using your system. Note, however, that password protection does not take effect until you reboot 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 boots 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 time 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. Enter the System Setup program by pressing <F2>.

2. Select the **System Security** screen field to verify that the **Password Status** option is set to **Unlocked**.

3. Reboot your system to force a prompt for a system password.

4. When prompted, type the system password.

5. Press <Ctrl><Enter> to disable the existing system password, instead of pressing <Enter> to continue with the normal operation of your system.

6. Confirm that **Not Enabled** is displayed for the **System Password** option of the System Setup program.

   If **Not Enabled** appears for the **System Password** option, the system password has been deleted. If you want to assign a new password, continue with **step 7. If Not Enabled** is not displayed for the **System Password** option, press the <Alt><b> key combination to reboot the system, and then repeat steps 4 through 6.

7. 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 setup password protection.

You can assign a setup password using 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 you open the system chassis, change the password jumper setting to disable the passwords, and erase the existing passwords. For more information on disabling a forgotten password, see your *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 (rebooting 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 exceptions:

- l   You can still modify the **Date**, **Time**, **Keyboard Num Lock**, and **Speaker** options.

- l   If **System Password** is not enabled and is not locked using the **Password Status** option, you can assign a system password (however, you cannot delete 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 and press the left- or right-arrow key to delete 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

See your *Installation and Troubleshooting Guide*.

Asset Tag Utility

You can use the Asset Tag utility to assign a unique tracking number to your system. This number is displayed on the System Setup program main screen.

NOTE: The Asset Tag utility works only with operating systems that support MS-DOS®-based applications.

Creating the Asset Tag Utility Diskette

1.   Insert the *Dell OpenManage Server Assistant* CD into the CD drive of a system running a Microsoft Windows operating system, and reboot the system.

2.   Insert a blank diskette into the system's diskette drive.

3.   Click **System Tools** on the **Dell OpenManage Server Assistant** main screen.

4.   Select **Create CD Boot Diskette**.

Assigning or Deleting an Asset Tag Number

1.   Insert the Asset Tag utility diskette that you created into the diskette drive, and reboot the system.

2.   You can either assign or delete an asset tag number.

     - l   To assign an asset tag number, type asset and a space followed by the new string.

An asset tag number can have up to 10 characters. Any combination of characters is valid. For example, at the `a:\>` prompt, type the following command and press <Enter>:

`asset 12345abcde`

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

3.   When prompted to verify the change to the asset tag number, type `y` and press <Enter>.

To view the Asset Tag utility help screen, type `asset /?` and press <Enter>.

Glossary

Dell™ PowerEdge™ 1600SC 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 number

An individual number 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.

CERC

Abbreviation for cost-effective RAID controller.

COM*n*

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.

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:

- l Data transfer rates of up to 16 MBps
- l Support for drives other than just hard drives, such as CD and tape drives
- l Support for hard drives with capacities greater than 528 MB
- l 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

Abbreviation for 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.

LPT*n*

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.

mirroring

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

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 Microsoft 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.

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:

- l   Its read-only attribute is enabled.

- l   It resides on a physically write-protected diskette or on a diskette in a write-protected drive.

- l   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 for 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.

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:

- l   Microprocessor
- l   RAM
- l   Controllers for standard peripheral devices, such as the keyboard
- l   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 diagnostics

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

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.

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.

Back to Contents Page