Dell™ PowerEdge™ 1655MC Systems User's Guide

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

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

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

Model EMP

Initial release: 17 Jul 2002

Technical Specifications

Dell™ PowerEdge™ 1655MC Systems User's Guide

Server Module

Microprocessor	
Microprocessor type	up to two Intel® Pentium® III microprocessors with a minimum internal operating frequency of at least 1.26 GHz per processor
Front-side bus (external) speed	133 MHz
Internal cache	512 KB cache
Math coprocessor	internal to microprocessor

Memory	
Architecture	72-bit ECC PC-133 registered SDRAM DIMMs
Memory module sockets	two 72-bit wide 168-pin DIMM sockets
Memory module capacities	128-, 256-, 512 MB, or 1-GB registered SDRAM DIMMs, rated for 133-MHz operation
Minimum RAM	128 MB
Maximum RAM	2 GB

Drives	
SCSI hard drives	up to two 1-inch, internal Ultra3 SCSI
USB CD drive	one external, USB CD drive
USB diskette drive	one external 3.5-inch, 1.44-MB USB diskette drive

Ports and Connectors	
Externally accessible:	
Front:	
USB	one 4-pin connector

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

Physical	
Height	11.53 cm (4.54 inches)
Width	7.06 cm (2.78 inches)
Depth	40.66 cm (16.01 inches)
Weight	maximum 3.17 kg (7 lbs)

Power	
System battery	CR2032 3.0-V lithium coin cell

System

Drives	
USB CD drive	one external, USB CD drive
USB diskette drive	one external 3.5-inch, 1.44-MB diskette drive

Ports and Connectors	
System management module:	
Serial	one 9-pin DB-9 connector
Network port	one RJ45 connector for integrated 10/100 NIC
KVM switch	one RJ45 connector for connection to an external digital KVM
Video	one 15-pin connector
PS/2-style keyboard	6-pin mini-DIN connector

PS/2-compatible mouse	6-pin mini-DIN connector

Network switch module:	
uplink port	four RJ45 connectors for integrated 10/100/1000 BASE-T ports
network switch management port	one RJ11 serial connector for managing the network switch module

Power	
Power supply:	
Wattage	1048 W (AC)
Voltage	100–240 VAC, 50/60 Hz, 12.0-6.0 A
Heat dissipation	250 W or 875 BTU/hr
Maximum inrush current	under typical line conditions and over the entire system ambient operating range, the inrush current may reach 55 A per power supply for 10ms or less
Hold time	20 mS

Physical	
Height	12.87 cm (5.09 inches)
Width	44.45 cm (17.5 inches)
Depth	73.66 cm (29 inches)
Weight	maximum 49.89 kg (110 lbs)

| Environmental	
Temperature:	
Operating	10°C to 35°C (50°F to 95°F)
Storage	–40° to 65°C (–40°F to 149°F)
Relative humidity:	
Operating	20% to 80% (noncondensing) with a maximum humidity gradation of 10% per hour
Storage	5% to 95% (noncondensing) with a maximum humidity gradation of 10% per hour
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz for 15 minutes
Storage	0.5 G at 3 to 200 Hz for 15 minutes
Maximum shock:	
Operating	one shock pulse in the positive and negative x, y, and z axes (one pulse on each side of the system) of 41 G for up to 2 ms
Storage (nonprofessional)	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.)

System Overview

Dell™ PowerEdge™ 1655MC Systems User's Guide

- Server Module Status Features
- Back-Panel Features
- System Features
- Supported Operating Systems
- Power Protection Devices
- Other Documents You May Need
- Obtaining Technical Assistance

Your system can include up to six server modules (or blades). Each server module functions as an individual system encompassing up to two microprocessors, up to two hard drives, and up to two memory modules (see Figure 1-1). To function as a system, a server module is inserted into a chassis which includes power supplies, fans, a system management module, and at least one network switch module. The power supplies, fans, system management module, and network switch module are shared resources of the server modules in the chassis. In addition, your system may also ship with a USB diskette drive and a USB CD drive, which you can use for system setup and configuration.

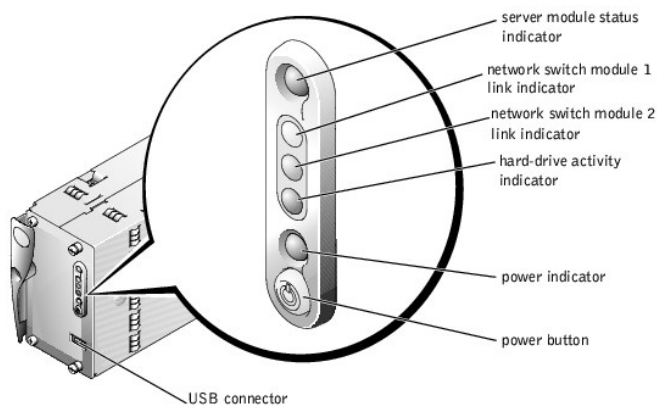**Figure 1-1. System Overview**

server modules (6)
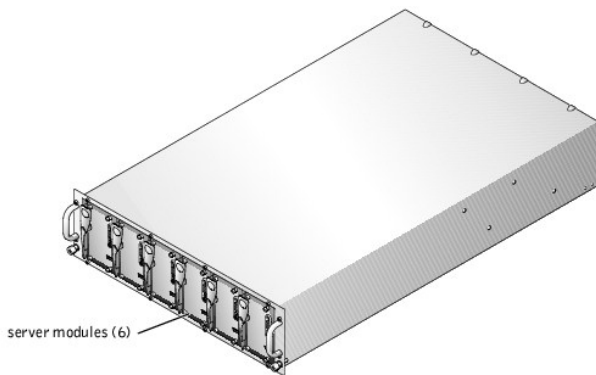
This section describes the major hardware and software features of your system and provides information about the indicators on the system's front and back panels. It also provides information about other documents you may need when setting up your system and how to obtain technical assistance.

Server Module Status Features

Each server module has five indicators and one power button on the front of the server module (see Figure 1-2). The indicators include a status indicator, two network link indicators, a hard-drive activity indicator, and a power indicator. The server module has a USB port on the front of the module. The USB port is used to connect either the USB diskette drive or USB CD drive.

NOTE: The USB port can only be used with the USB diskette drive or USB CD drive supplied by Dell. The USB port will not operate properly with any other USB device.

Figure 1-2. Server Module Indicators

- server module status indicator
- network switch module 1 link indicator
- network switch module 2 link indicator
- hard-drive activity indicator
- power indicator
- power button
- USB connector

provides information about the status indicators.

Table 1-1. Server Module Status Features

Indicator Type	Indicator	Indicator Code
Status indicator	Off	Power is not available to the server module, the server module is not powered on, or the server module is initializing.
	Blue	The module is operating normally.
	Blue blinking	The module is identifying itself. **NOTE:** Systems management software causes the indicator to blink to identify a particular module.
	Amber	The system management module is not installed.
	Amber blinking	Indicates a fault with the system or server module.
Network switch module link indicators (2)	Off	Indicates that the server module does not have a link to the network switch module.
	Green on	Indicates that the server module has a valid link to the network switch module. **NOTE:** If only one network switch module is installed, only one link indicator will operate.
	Green blinking	Indicates network activity between the external network and the network switch module.
Hard-drive activity indicator	Green blinking	Indicates hard drive activity.
Power indicator	Green blinking	Indicates that the module is installed correctly and can be powered on by pressing the power button.
	Green (steady)	Indicates that power is supplied to the server module, and the module is operational.
	Amber blinking	Indicates a power fault or other condition that causes the server module to shut down.
Power button	None	Turns server module power off and on. l If you turn off the module using the power button, and the module is running an ACPI-compliant operating system, the module can perform an orderly shutdown before the power is turned off. l If the module is not running an ACPI-compliant operating system, power is turned off immediately after the power button is pressed. The button is enabled in the System Setup program. When disabled, you can only use the button to turn on the server module.

NOTE: If the hard-drive activity indicator and the link indicators blink one after another, the server module is initializing. The initialization time varies based on the number of server modules installed and network activity.
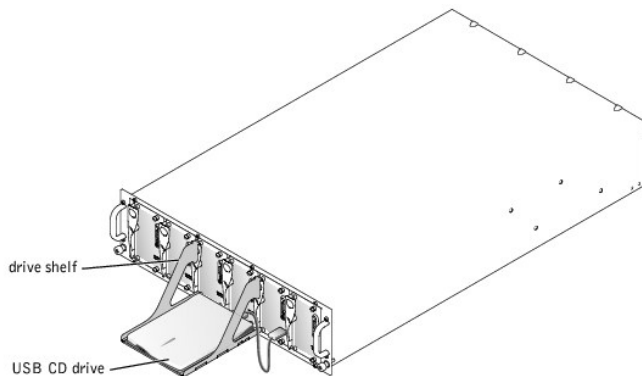
Using the USB Diskette or USB CD Drives

Each server module has a USB port on the front of the server module, which allows you to connect a USB diskette drive or USB CD drive. The drives are used to configure the server module.

NOTE: The USB port can only be used with the USB diskette drive or USB CD drive supplied by Dell. The USB port will not operate properly with any other USB device.

1. Attach the drive shelf to the front of the system (see Figure 1-3).

   Ensure that the drive shelf rests on the center handles of the server modules. If it is placed in the center, you can attach one of the USB drives to any server module.

Figure 1-3. Attaching the Drive Shelf

NOTICE: The USB diskette or USB CD drive must be placed on the drive shelf during operation. The drive must be horizontal and level to operate properly.

2. Place the drive on the shelf and attach the drive to the server module that you want to configure.

   NOTE: If the drive must be designated as the boot drive, reset the power on the server module.

3. Remove the drive and the drive shelf. Do not leave the drive attached during normal system operation.

Back-Panel Features

The back of the system provides access to the network switch modules (2), the system management module, the fans, and power supplies (see Figure 1-4). Table 1-2 provides information about the back-panel features.
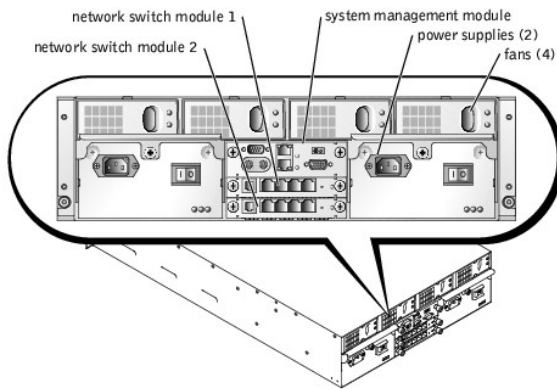
Figure 1-4. Back-Panel Features

Table 1-2. Back-Panel Features

Component	Description
Power supply indicators	Provide information about power status (see "Power-Supply Indicator Codes").
Network switch module indicators	Provide information about the 10/100/100 BASE-T network status (see "Network Switch Module Features").
System management module indicators	Provide information about system status, system management status, and port status.

Power-Supply Indicator

Each hot-pluggable power supply has indicators that can provide information about power status, fault, and the presence of AC power (see Figure 1-5). Table 1-3 lists the power-supply indicator codes.

Figure 1-5. Power-Supply Indicators
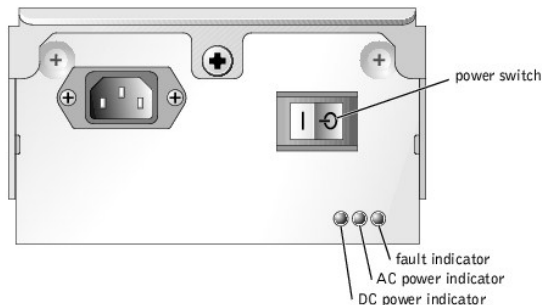
Table 1-3. Power-Supply Indicator Codes

Indicator	Activity Indicator	Indicator Code
DC power indicator	Green	Indicates that the power supply is operational.
AC power present indicator	Green	Indicates that AC power is present at the power supply and that the system is connected to an AC power source.
Fault indicator	Amber	Indicates that the power supply is in a fault condition. See your system *Installation and Troubleshooting Guide* for more information.

Network Switch Module Features

Each system can accommodate up to two network switch modules. The network switch modules provide information about network activity and link status and a system fault indicator (see Figure 1-6). The switch also provides an external RJ11 connection to a serial null modem cable used for switch setup and configuration. The RJ11 is not used during normal system operation. Table 1-4 provides details about the operation of the indicators.

> **NOTE:** Do not connect the configuration port to a data or telephone network.

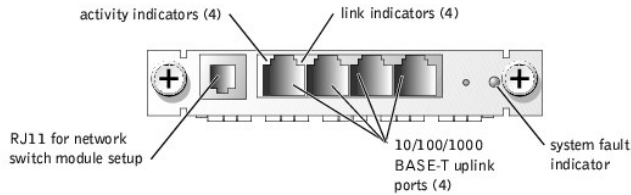**Figure 1-6. Network Switch Module Indicators and Features**

Table 1-4. Network Switch Module Indicator Codes

Indicator Type	Activity Indicator	Indicator Code
Network indicator	Green	The port is connected to a valid link partner on the network.
	Blinking	Network data is being sent or received.
System fault indicator	Green	Indicates normal system operation.
	Amber	Indicates a system power fault. See your system *Installation and Troubleshooting Guide* for more information.

System Management Module Features

The system management module provides:

- Keyboard/mouse/video access to each server module
- Serial and Ethernet management ports
- An analog rack interface port to attach to an optional external KVM over IP switch

> **NOTE:** Connect the analog rack interface port only to an external KVM over IP switch provided by Dell.

- Status indicators for the system management module and for the link to the system's onboard network switch module.

In addition, a system status connector allows you to attach the system status cable so that you can monitor system status after the system is mounted in a rack (see Figure 1-7). Table 1-5 provides information about the status indicators.

Figure 1-7. System Management Module Features
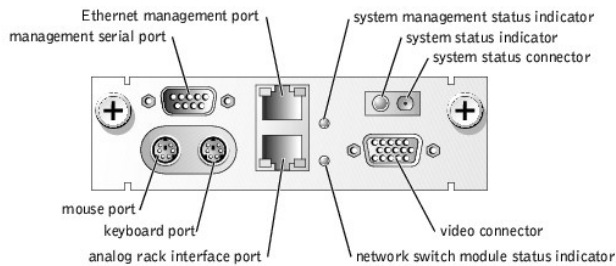
Table 1-5. System Management Module Indicators

Indicator Type	Activity Indicator	Indicator Code
System status indicator	Blue	System is operating normally.
	Amber	A system fault is present. See your system *Installation and Troubleshooting Guide* for more information.
System management status indicator	Green	System management module is operating normally.
	Amber	Indicates a system management module fault. See your system *Installation and Troubleshooting Guide* for more information.
Network switch module status indicator	Green	Indicates that the system management module and the onboard network switch module are communicating.

Ethernet management port	Off	The ERA/MC is not connected to the network.
	Green	The ERA/MC is connected to a valid link partner on the network.
	Blinking	Data is being sent or received.
Analog rack interface port	Off	The KVM switch is not connected to an external KVM over IP switch.
	Green	The KVM switch is connected to a valid external KVM over IP switch.
	Blinking	Data is being sent or received.

Fan Features

The system has four hot-pluggable system fans. Each fan has two indicators. Figure 1-8 shows a fan. Table 1-6 shows the fan indicator codes.

Figure 1-8. System Fan

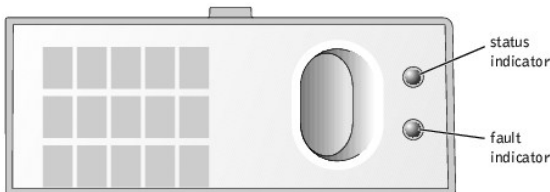**Table 1-6. Fan Indicators**

Indicator Type	Activity Indicator	Indicator Code
Status indicator	Green	Fan is receiving power.
Fault indicator	Amber	Fan is in fault condition. See your *Installation and Troubleshooting Guide* for additional information.

System Features

l Support for up to six server modules. The system can support from one to six server modules. If less than six modules are installed in the system, a blank module is used. Blank modules are required for proper operation.

l System management module which provides access to systems management software features and the KVM switch.

   o To access system management features, connect the null modem cable between the management port and an external PC. You may also obtain system management information through a Web browser connected to the RJ45 management port. Systems management software monitors the system and server module status.

   o The system management module includes keyboard, video, and mouse connectors. The onboard KVM switch provides an onscreen display to select a server module.

   o Embedded systems management circuitry that monitors operation of the system fans, and critical system voltages and temperatures. The systems management circuitry works in conjunction with your systems management software.

l Support for up to two network switch modules. Externally, each switch has four 10/100/1000 BASE-T Ethernet ports.

l Four hot-pluggable system fans.

l Two 1048-watt, hot-pluggable, redundant power supplies. The system can operate without power redundancy with six server modules and only one power supply turned on.

Server Module Features

l One or two Intel® Pentium® III microprocessors with an internal operating speed of at least 1.26 GHz, a 512 KB cache, and a front-side (external) bus speed of 133 MHz.

l A minimum of 128 MB of system memory, upgradable to a maximum of 2 GB by installing PCI 133 registered, SDRAM memory modules in the two memory module sockets on the system board.

l Support for up to two 1-inch, internal Ultra3 SCSI hard drives.

l Integrated internal drive mirroring allows two SCSI disks to be mirrored through the integrated RAID controller.

l An external USB port to support either a 1.44-MB, 3.5-inch diskette drive or a USB CD drive. When either the diskette or USB CD drive is attached to the server module during boot, the drive is designated as the first boot drive. This designation allows you to install software on the server module's hard drives.

l 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 1600 x 1200 x 16.7 million colors (noninterlaced).

For more information about specific features, see "Technical Specifications" and "Other Documents You May Need."

Software Features

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

l Enhanced security features, including a system password and a setup password, available through the System Setup program.

- System diagnostics for evaluating system components and devices. For information about using diagnostics, see "Running System Diagnostics" in your *Installation and Troubleshooting Guide*.

- Video drivers for displaying many application programs in high-resolution modes. For more information about drivers, see "Using the Dell OpenManage Server Assistant CD."

- Systems management software and documentation. Systems management software is used to manage and monitor each individual server module as well as the system as a whole including all of the server modules, network switch modules, power supplies, and fans. Systems management software manages the system locally and remotely on a network. Dell recommends that you use the systems management software provided with this system.

- Optional solutions software for Web hosting, caching, or load balancing. See your solutions software documentation for more information.

Supported Operating Systems

- Microsoft® Windows® 2000 Server and Advanced Server

- Windows.NET Server family

- Red Hat Linux Professional 7.3

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. 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 *Rack Installation Guide* included with your rack solution describes how to install your system into a rack.

- 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 describing 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; see **www.dell.com/training** for more information. This service may not be offered in all locations.

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Using the Dell OpenManage Server Assistant CD

Dell™ PowerEdge™ 1655MC Systems User's Guide

- Starting the Dell OpenManage Server Assistant CD
- Setting Up Your Server Modules
- Updating Drivers and Utilities
- Utility Partition

The *Dell OpenManage Server Assistant* CD contains utilities, diagnostics, and drivers that can help you configure your server modules to 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).

NOTE: The *Dell OpenManage Server Assistant* CD is not required for the first time deployment of your server module if it came with a preinstalled operating system or solution software.

Starting the Dell OpenManage Server Assistant CD

The Dell OpenManage™ Server Assistant application program guides you through the operating system setup and configuration process. You may also use the *Dell OpenManage Server Assistant* CD to recreate the utility partition.

To install an operating system on a server module, attach the USB CD drive to the USB port on the front of the server module, insert the *Dell OpenManage Server Assistant* CD into the USB CD drive, and turn on or reboot the server module (see "Using the USB Diskette or USB CD Drives" in "System Overview"). By connecting the CD or diskette drive before booting the server module, the attached USB drive is automatically designated as the first drive in the boot sequence.

NOTE: You must use the *Server Assistant* CD to install an operating system. Using the *Server Assistant* CD ensures that the correct drivers are installed on the server module.

From the KVM window, select the server module whose video that you want to view. The **Dell OpenManage Server Assistant** main page appears. The **Dell OpenManage Server Assistant** uses a standard Web browser interface. The KVM switch also switches the keyboard and mouse so that you can use the Web browser interface on each server module.

Setting Up Your Server Modules

If you purchase a server module that does not have an operating system preinstalled or if you install an operating system at a later date, use the Server Setup feature to configure your system or install your operating system.

Use the Server Setup feature for most situations, including installing and reinstalling an operating system. 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 feature, perform the following steps:

1. Click **Server Setup** on the **Dell OpenManage Server Assistant** main screen.

2. Follow the directions on the screen to complete the installation and configuration process.

The Server Setup feature takes you through the following tasks:

- Setting the server module date and time
- Configuring your RAID controller (if applicable)
- Selecting your operating system
- Configuring hard drives
- Entering operating system information
- Viewing an installation summary
- Installing an operating system

Updating Drivers and Utilities

You can create and update drivers and utilities on any system that has Microsoft® Internet Explorer 4.0 or later or Netscape Navigator 6.0 or later. When you attach the CD drive to a server module that uses the Microsoft Windows®-based operating systems, the module automatically starts the browser software and displays the **Dell OpenManage Server Assistant** main page.

To update a driver or utility, perform the following steps:

1. Select the system model from the drop-down box.

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

3. Click **Continue**.

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

   You are prompted for a location in which to save the files.

5. Select the location where you want to save the files.

   The files are in a compressed format.

6. Decompress the files.

   The files are now ready to be installed or used on your server.

Utility Partition

The utility partition is a bootable partition on the hard drive that contains system configuration and diagnostic utilities. 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 server module. During POST, press <F10> when 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 **Utility Partition** main menu.

Table 2-1 provides a sample list and explanation of the options that appear on the utility partition menu.

Table 2-1. Utility Partition Main Menu Options

Option	Description
Run system diagnostics	Runs the system hardware diagnostics. (See your system's *Installation and Troubleshooting Guide*.)
Run RAID configuration utility	Runs the RAID configuration utility.
NOTE: The options displayed on your system depend on your system configuration and may not include all of those listed here.	

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Using the System Setup Program

Dell™ PowerEdge™ 1655MC Systems User's Guide

- ● Entering the System Setup Program
- ● System Setup Options
- ● Using the System Password Feature
- ● Using the Setup Password Feature
- ● Asset Tag Utility

Each server module has its own System Setup program. Throughout this section, the server modules are referred to as systems since each server module functions independently as a system.

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 settings.

You can use the System Setup program as follows:

- l To change the system configuration information after you add, change, or remove any hardware in your system
- l To set or change user-selectable options—for example, the time or date on your system
- l To enable or disable any integrated device 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.

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:

   `<F2> = System Setup`

   You can also press <F10> to enter Utility mode or <F12> for PXE Boot. PXE Boot 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, and 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 monitor screen while the system is starting up, make a note of the message. 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: After installing a memory upgrade, it is normal for your system to send a message the first time you start your system. In that situation, do not refer to "System Beep Codes" and "System Messages." Instead, see "Adding Memory" in your *Installation and Troubleshooting Guide* for instructions.

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

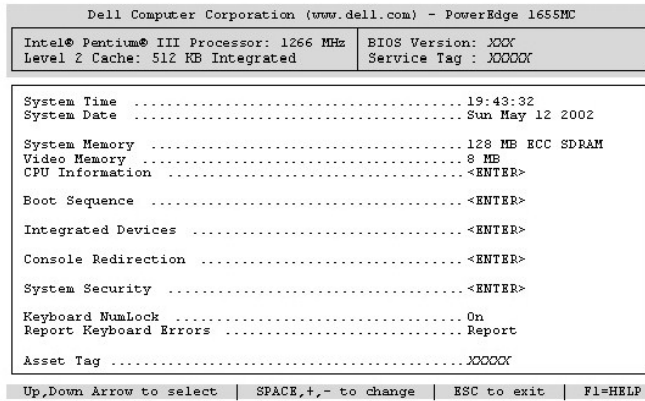| Keys	Action
Down arrow or <Tab>	Moves to the next field.
Up arrow or <Shift><Tab>	Moves to the previous field.
Left and right arrows or Spacebar	Cycles through the settings in a field. In many fields, you can also type the appropriate value.
<Esc>	Exits the System Setup program and restarts the system 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 start the system. For a few options (as noted in the help area), the changes take effect immediately.

System Setup Options

Main Screen

When the System Setup program runs, the main program screen appears (see Figure 3-1). Fields that display in blue do not have user-selectable options.

Figure 3-1. Main System Setup Screen

```
        Dell Computer Corporation (www.dell.com) - PowerEdge 1655MC

  Intel® Pentium® III Processor: 1266 MHz  │  BIOS Version: XXX
  Level 2 Cache: 512 KB Integrated         │  Service Tag : XXXXX

  System Time   ........................................19:43:32
  System Date   ........................................Sun May 12 2002

  System Memory ........................................128 MB ECC SDRAM
  Video Memory  ........................................8 MB
  CPU Information ......................................<ENTER>

  Boot Sequence ........................................<ENTER>

  Integrated Devices ..................................<ENTER>

  Console Redirection .................................<ENTER>

  System Security ....................................<ENTER>

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

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

  Up,Down Arrow to select  │  SPACE,+,- to change  │  ESC to exit  │  F1=HELP
```

Table 3-2 shows the options and information fields in the System Setup program.

Table 3-2. System Setup Program Options

Option	Description
System Time	Resets the time on the system's internal clock.
System Date	Resets the date on the system's internal calendar.
System Memory	Displays the amount of system memory. No user-selectable settings are available.
Video Memory	Displays the amount of video memory. No user-selectable settings are available.
CPU Information	Displays information related to the microprocessor bus and microprocessors. No user-selectable settings are available.
Boot Sequence	Determines the order in which the system searches for boot devices during system startup. Available options can include the hard drives and **PXE1** and **PXE2** (network). If the USB CD drive or USB diskette drive is connected to the server module, the device appears in the boot sequence. When a USB drive is attached to the server module, the boot sequence order is **USB**, **PXE1**, **PXE2**, and **Hard Disk Drive**.
Integrated Devices	See "Integrated Devices Screen."
Console Redirection	See "Console Redirection Screen."
System Security	Displays a screen 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 (**On** default)	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 (**Report** default)	Enables or disables reporting of keyboard errors during the POST. This option is useful when applied to self-starting 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 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

Table 3-3 shows the options for the **Integrated Devices** screen.

Table 3-3. Integrated Devices Screen Options

Option	Description
Network Interface **Controller** (1 or 2)	Enables the system's two integrated NICs. Options are **On without PXE** and **On with PXE**. PXE support allows the system to boot from the network. Changes take effect after the system reboots.

(**On with PXE** default)	
MAC Address	Displays the MAC address for the corresponding integrated NIC. No user-selectable settings are available.
Mouse Controller (**On** default)	Enables or disables the system's mouse controller.
USB Controller (**On** default)	No user-selectable settings are available.
BIOS USB Support (**On** default)	No user-selectable settings are available.

Console Redirection Screen

Table 3-4 show the options used to configure the console redirection feature.

Table 3-4. Console Redirection Screen Options

Option	Description
Console Redirection (On default)	Toggles the console redirection feature **On** or **Off**.
Remote Terminal Type (**VT 100/VT 220** default)	Allows you to select either **VT 100/VT 220** (default) or **ANSI**.
Redirection After Boot (**Enable** default)	Enables or disables console redirection after your system restarts.

System Security Screen

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

l Password Status — When **Setup Password** is set to **Enabled**, 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.

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. See your *Installation and Troubleshooting Guide* for instructions about disabling a forgotten setup password.

l 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 your *Installation and Troubleshooting Guide* for instructions about disabling a forgotten system password.

   NOTE: You can still turn a system on using the power button, even if the **Power Button** option is set to **Disabled**.

Exit Screen

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

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. 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, then operate your system 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 change a jumper setting that disables the system password feature (see your system *Installation*

and Troubleshooting Guide). The setup password is erased 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, perform the following steps:

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 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 5.

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 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 **+** or **-** 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

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> twice 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."

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 (see "Using the USB Diskette or USB CD Drives" in "System Overview").

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`

   l 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>.

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Glossary

Dell™ PowerEdge™ 1655MC 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.

ACPI

Abbreviation for Advanced Configuration and Power Interface.

ambient temperature

The temperature of the area or room where the system is located. Also known as room temperature.

ANSI

Abbreviation for American National Standards Institute.

application

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.

ARI

Analog Rack Interface

ASCII

Abbreviation for American Standard Code for Information Interchange.

asset tag code

An individual code assigned to a system, or server module 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.

blade

A server module which contains a processor, memory and a hard drive. Server modules are mounted into a chassis which includes power supplies and fans.

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.

bootable diskette

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

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.

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.

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.

CPU

Abbreviation for central processing unit. See also microprocessor.

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 from the config.sys file (with a device= statement) or as memory-resident programs (usually, from the autoexec.bat file). Others—such as video drivers—must load when you start the program for which they were designed.

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*.

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, and asset tag. Information about the system's components is displayed as a MIF file.

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.

DVD

Abbreviation for digital versatile disk.

ECC

Abbreviation for error checking and correction.

EEPROM

Acronym for electrically erasable programmable read-only memory.

EID

Acronym for electronic identification number.

EMC

Abbreviation for Electromagnetic Compatibility.

EMI

Abbreviation for electromagnetic interference.

ERA/MC

Abbreviation for embedded remote access. ERA allows you to perform remote systems management.

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.

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. The Windows 2000 operating systems can 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.

FSB

Abbreviation for front side bus. The FSB is the data path and physical interface between the microprocessor and the main memory (RAM).

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.

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*.

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.

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.

ID

Abbreviation for identification.

integrated mirroring

Provides simultaneous physical mirroring of two drives. *See mirroring.*

interlacing

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

internal microprocessor cache

An instruction and data cache built 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.

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.

KVM

Keyboard, video, and mouse. Used when referring to switch that allows selection of system from which the video will be displayed and the which will use the keyboard and mouse.

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.

m

Abbreviation for meter(s).

mA

Abbreviation for milliampere(s).

MAC

Abbreviation for Media Access Control.

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 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.

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).

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).

MS-DOS

Abbreviation for Microsoft Disk Operating System.

NDIS

Abbreviation for Network Driver Interface Specification.

NIC

Acronym for network interface controller.

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 2000 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.

OS

Abbreviation for operating system.

partition

You can divide a hard drive into multiple physical sections called *partitions* with the fdisk command. Each partition can contain multiple logical drives.

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

PCI

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

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.

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.

program diskette set

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

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 micro--**processor) to 4 GB (Intel386™ or higher micro**-processor)

- Multitasking

- Virtual memory, a method for increasing addressable memory by using the hard drive

The Windows NT® and UNIX® 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.

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.

ROMB

Acronym for RAID on Motherboard.

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 customer or technical support.

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.

SMP

Abbreviation for symmetric multiprocessing. SMP is a system that has two or more microprocessors connected via a high-bandwidth link and managed by an operating system, where each microprocessor has equal access to I/O devices. This is in contrast to parallel processing, where a front-end microprocessor handles all I/O to disks, terminals, local area networks, and so on.

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.

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.

system.ini file

A start-up file for the Windows operating system. When you start Windows, it consults the **system.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **system.ini** file records which video, mouse, and keyboard drivers are installed for Windows.

Running the Control Panel or Windows Setup program may change options in the **system.ini** file. On other occasions, you may need to change or add options to the **system.ini** file manually with a text editor, such as Notepad.

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 mode

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

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.

uplink port

A port on a network hub or switch used to connect to other hubs or switches without requiring a crossover cable.

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.

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.

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.

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).

win.ini file

A start-up file for the Windows operating system. When you start Windows, it consults the **win.ini** file to determine a variety of options for the Windows operating environment. Among other things, the **win.ini** file records what printer(s) and fonts are installed for Windows. The win.ini file also usually includes sections that contain optional settings for Windows application programs that are installed on the hard drive.

Running the Control Panel or Windows Setup program may change options in the **win.ini** file. On other occasions, you may need to change or add options to the **win.ini** file manually with a text editor such as Notepad.

Windows 2000

An integrated and complete Microsoft Windows operating system that does not require MS-DOS and that provides advanced operating system performance, improved ease of use, enhanced workgroup functionality, and simplified file management and browsing.

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.

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