

Dell™ PowerVault™ 745N NAS Systems User's Guide

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Notes, Notices, and Cautions



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



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



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

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Glossary

Dell™ PowerVault™ 745N NAS Systems User's Guide

This section defines or identifies technical terms, abbreviations, and acronyms used in your system documents.

A
Ampere(s)
AC
Alternating current
ACPI
Advanced Configuration and Power Interface: a standard interface for enabling the operating system to direct configuration and power management
ambient temperature
The temperature of the area or room where the system is located
ANSI
American National Standards Institute: the primary organization for developing technology standards in the U.S.
application
Software designed to help you perform a specific task or series of tasks. Applications run from the operating system.
ASCII
American Standard Code for Information Interchange
asset tag
An individual code assigned to a system, usually by an administrator, for security or tracking purposes
backup
A copy of a program or data file. As a precaution, back up your system's hard drive on a regular basis. Before making a change to the configuration of your system, back up important start-up files from your operating system.
backup battery
A battery that 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
Basic input/output system. Your system's BIOS contains programs stored on a flash memory chip. The BIOS controls the following:

- 1 Communications between the processor and peripheral devices
- 1 Miscellaneous functions, such as system messages

bit

The smallest unit of information interpreted by your system

blade

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

BMC

Baseline management controller

boot routine

A program that clears all memory, initializes devices, and loads the operating system when you start your system. Unless the operating system fails to respond, you can reboot (also called *warm boot*) your system by pressing <Ctrl><Alt>. Otherwise, you must restart the system by pressing the reset button or by turning the system off and then back on.

BTU

British thermal unit

bus

An information pathway between the components of a system. Your system contains an expansion bus that allows the processor to communicate with controllers for the peripheral devices connected to the system. Your system also contains an address bus and a data bus for communications between the processor and RAM.

C

Celsius

cache

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

Compact disc. CD drives use optical technology to read data from CDs.

component

As they relate to DMI, components include 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.

COM n

The device names for the serial ports on your system

control panel

The part of the system that contains indicators and controls, such as the power button and power indicator

controller

A chip that controls the transfer of data between the processor and memory or between the processor and a peripheral

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 processor of specific processing tasks. A math coprocessor, for example, handles numeric processing.

DC

Direct current

DDR

Double-data rate; a technology in memory modules that potentially doubles the output

device driver

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

DHCP

Dynamic Host Configuration Protocol; a method of automatically assigning an IP address to a client system

diagnostics

A comprehensive set of tests for your system

DIMM

Dual in-line memory module. See also *memory module*.

DIN

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. Additional directories that branch off the root directory are called *subdirectories*. Subdirectories may contain additional directories branching off them.

DMA

Direct memory access. A DMA channel allows certain types of data transfer between RAM and a device to bypass the processor.

DMI

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

DNS

Domain Name System; a method of translating Internet domain names, such as **www.dell.com**, into IP addresses, such as 143.166.83.200

DRAM

Dynamic random-access memory. A system's RAM is usually made up entirely of DRAM chips.

DVD

Digital versatile disc

ECC

Error checking and correction

EEPROM

Electrically erasable programmable read-only memory

EMC

Electromagnetic compatibility

EMI

Electromagnetic interference

ESD

Electrostatic discharge

expansion bus

Your system contains an expansion bus that allows the processor to communicate with controllers for peripherals, such as network adapters.

expansion card

An add-in card, such as a network adapter or SCSI adapter, that plugs into an expansion-card connector on the system board. An expansion card adds some specialized function to the system by providing an interface between the expansion bus and a peripheral.

expansion-card connector

A connector on the system board or riser board for plugging in an expansion card

F

Fahrenheit

FAT

File allocation table. The file system structure used by MS-DOS to organize and keep track of file storage.

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

Front-side bus. The FSB is the data path and physical interface between the processor and the main memory (RAM).

ft

Feet
FTP File transfer protocol
g Gram(s)
G Gravities
Gb Gigabit(s); 1024 megabits or 1,073,741,824 bits
GB Gigabyte(s); 1024 megabytes or 1,073,741,824 bytes. However, when referring to hard-drive capacity, the term is usually rounded to 1,000,000,000 bytes.
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.
guarding A type of data redundancy in which a set of physical drives stores data and an additional drive stores parity data. See also <i>mirroring</i> , <i>striping</i> , and <i>RAID</i> .
h 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. In text, hexadecimal numbers are often followed by <i>h</i> .
headless system A system or device that functions without having a keyboard, mouse, or monitor attached. Normally, headless systems are managed over a network using an Internet browser.
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 Hertz
I/O Input/output. A keyboard is an input device, and a monitor is an output device. In general, I/O activity can be differentiated from computational activity.
ID Identification

IDE

Integrated drive electronics: a standard interface between the system board and storage devices

integrated mirroring

Provides simultaneous physical mirroring of two drives. Integrated mirroring functionality is provided by the system's hardware. See also *mirroring*.

internal processor cache

An instruction and data cache built into the processor

IP

Internet Protocol

IRQ

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 processor. Each peripheral connection must be assigned an IRQ number. Two devices can share the same IRQ assignment, but you cannot operate both devices simultaneously.

jumper

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, providing a simple and reversible method of changing the circuitry in a board.

K

Kilo-, indicating 1000

Kb

Kilobit(s): 1024 bits

KB

Kilobyte(s): 1024 bytes

Kbps

Kilobit(s) per second

KBps

Kilobyte(s) per second

key combination

A command requiring you to press multiple keys at the same time (for example, <Ctrl><Alt>)

kg

Kilogram(s): 1000 grams

KMM

Keyboard/monitor/mouse

KVM

Keyboard/video/mouse. KVM refers to a switch that allows selection of the system from which the video is displayed and for which the keyboard and mouse are used.

LAN

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

lb

Pound(s)

LCD

Liquid crystal display

LED

Light-emitting diode; an electronic device that lights up when a current is passed through it

Linux

A version of the UNIX® operating system that runs on a variety of hardware systems. Linux is open source software, which is freely available; however, the full distribution of Linux along with technical support and training are available for a fee from vendors such as Red Hat Software.

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. See also *bus*.

m

Meter(s)

mA

Milliampere(s)

MAC address

Media Access Control address: your system's unique hardware number on a network

Mb

Megabit(s): 1,048,576 bits

MB

Megabyte(s): 1,048,576 bytes. However, when referring to hard-drive capacity, the term is often rounded to mean 1,000,000 bytes.

Mbps

Megabits per second

MBps

Megabytes per second

MBR

Master boot record

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

memory

An area in your system that stores basic system data. A system can contain several different forms of memory, such as integrated memory (ROM and RAM) and add-in memory modules (DIMMs).

MHz

Megahertz

mirroring

A type of data redundancy in which a set of physical drives stores data and one or more sets of additional drives stores duplicate copies of the data. Mirroring functionality is provided by software. See also *guarding*, *integrated mirroring*, *striping*, and *RAID*.

mm

Millimeter(s)

ms

Millisecond(s)

MS-DOS

Microsoft Disk Operating System

NAS

Network Attached Storage: one of the concepts used for implementing shared storage on a network. NAS systems have their own operating systems, integrated hardware, and software that are optimized to serve specific storage needs.

NIC

Network interface controller: device that is installed or integrated in a system to allow connection to a network

NMI

Nonmaskable interrupt. A device sends an NMI to signal the processor about hardware errors.

NVRAM

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.

parity

Redundant information that is associated with a block of data

partition

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

PCI

Peripheral Component Interconnect: a standard for local-bus implementation

PDU

Power distribution unit; a power source with multiple power outlets that provides electrical power to servers and storage systems in a rack

peripheral

An internal or external device, such as a diskette drive or keyboard, connected to a system

PGA

Pin grid array; a type of processor socket that allows you to remove the processor 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

Power-on self-test. Before the operating system loads when you turn on your system, the POST tests various system components such as RAM and hard drives.

processor

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

PS/2

Personal System/2

PXE

Preboot eXecution Environment; a way of booting a system via a LAN (without a hard drive or bootable diskette)

RAC

Remote access controller

RAID

Redundant array of independent disks; a method of providing data redundancy. Some common implementations of RAID include RAID 0, RAID 1, RAID 5, RAID 10, and RAID 50. See also *guarding*, *mirroring*, and *striping*.

RAM

Random-access memory. The system's primary temporary storage area for program instructions and data. Any information stored in RAM is lost when you turn off your system.

RAS

Remote Access Service. This service allows users running the Windows operating system to remotely access a network from their system using a modem.

readme file

A text file, usually shipped with software or hardware, that contains information supplementing or updating the product's documentation.

read-only file

A read-only file is one that you are prohibited from editing or deleting.

ROM

Read-only memory. Your system contains some programs essential to its operation in ROM code. 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

RAID on Motherboard

rpm

Revolutions per minute

SATA

Serial Advanced Technology Attachment; a standard interface between the system board and storage devices

SCSI

Small computer system interface; an I/O bus interface with faster data transmission rates than standard ports

SDRAM

Synchronous dynamic random-access memory

sec

Second(s)

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

A bar code label on the system used to identify it when you call Dell for technical support

SMART

Self-Monitoring Analysis and Reporting Technology; allows hard drives to report errors and failures to the system BIOS and then display an error message on the screen

SMP

Symmetric multiprocessing; used to describe a system that has two or more processors connected via a high-bandwidth link and managed by an operating system, where each processor has equal access to I/O devices

SNMP

Simple Network Management Protocol; a standard interface that allows a network manager to remotely monitor and manage workstations

striping

Disk striping writes data across three or more disks in an array, but only uses a portion of the space on each disk. The amount of space used by a "stripe" is the same on each disk used. A virtual disk may use several stripes on the same set of disks in an array. See also *guarding*, *mirroring*, and *RAID*.

SVGA

Super video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards.

system board

As the main circuit board, the system board usually contains most of your system's integral components, such as the processor, RAM, controllers for peripherals, and various ROM chips.

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

See *bootable diskette*.

system memory

See *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 features such as password protection. 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.

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.

UNIX

UNiversal Internet eXchange. UNIX, the precursor to Linux, is an operating system written in the C programming language.

uplink port

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

UPS

Uninterruptible power supply; a battery-powered unit that automatically supplies power to your system in the event of an electrical failure

USB

Universal Serial Bus. A USB connector provides a single connection point for multiple USB-compliant devices, such as mice and keyboards. USB devices can 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

Unshielded twisted pair; a type of wiring used to connect systems in a business or home to a telephone line

V

Volt(s)

VAC

<p>Volt(s) alternating current</p>
<p>VDC</p> <p>Volt(s) direct current</p>
<p>VGA</p> <p>Video graphics array. VGA and SVGA are video standards for video adapters with greater resolution and color display capabilities than previous standards.</p>
<p>video adapter</p> <p>The logical circuitry that provides—in combination with the monitor—your system's video capabilities. A video adapter may be integrated into the system board or may be an expansion card that plugs into an expansion slot.</p>
<p>video driver</p> <p>A program that allows graphics-mode application programs and operating systems to display at a chosen resolution with the desired number of colors. Video drivers may need to match the video adapter installed in the system.</p>
<p>video memory</p> <p>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).</p>
<p>video resolution</p> <p>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.</p>
<p>W</p> <p>Watt(s)</p>
<p>WH</p> <p>Watt-hour(s)</p>
<p>win.ini file</p> <p>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. The win.ini file also usually includes sections that contain optional settings for Windows application programs that are installed on the hard drive.</p>
<p>Windows Storage Server 2003</p> <p>A set of Microsoft software technologies that enable software integration through the use of XML Web services. XML Web services are small reusable applications written in XML that allow data to be communicated between otherwise unconnected sources.</p>
<p>XML</p> <p>eXtensible Markup Language. XML is a way to create common information formats and to share both the format and the data on the World Wide Web, intranets, and elsewhere.</p>

Technical Specifications

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Processor	
Processor type	Intel® Pentium® 4 processor with a internal operating frequency of at least 2.8 GHz and a front-side bus speed of 800 MHz or Intel Celeron® processor with a internal operating frequency of at least 2.4 GHz and a front-side bus speed of 400 MHz or Intel Celeron processor with a internal operating frequency of at least 3.4 GHz and a front-side bus speed of 800 MHz

Expansion Bus	
Bus type	One PCI and one PCI-X
Expansion slots	One PCI-X 64-bit, 66-MHz 3.3 V slot and one PCI 32-bit, 33-MHz 5 V slot. Both support full-height, half-length boards

Memory	
Architecture	PC-3200 unbuffered DDR400 SDRAM
Memory module sockets	Four
Memory module capacities	256 MB, 512 MB, or 1 GB
Minimum memory capacity	512 MB
Maximum memory capacity	4 GB

Drives	
Hard drives	Two or four SATA hard drives

Ports and Connectors	
Back Panel:	
Serial	One 9-pin connector
Network adapter	Two RJ45 connectors for integrated 10/100/1000 network adapters
USB	Two USB 2.0 4-pin connectors
PS/2 style keyboard	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
Video	One 15-pin connector
Front Panel:	
USB	One USB 2.0 4-pin connector
Video	One 15-pin connector

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

Power	
Power supply:	
Wattage	280 watts
Voltage	100–240 VAC, 50–60 Hz
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 30 A per power supply for 10 ms or less
System battery	3.0-V lithium ion coin cell

Physical	
Height	4.2 cm (1.68 inches)
Width	42.5 cm (16.74 inches)
Depth:	
With optional bezel	59.7 cm (23.5 inches)
Weight	11.8 kg (26 lb), maximum configuration

Environmental	
Temperature:	
Operating	10°C to 35°C (50°F to 95°F) at 10,000 feet above sea level 10°C to 40°C (50°F to 104°F) at sea level
Storage	–40°C to 65°C (–40°F to 149°F)
Relative humidity:	
Operating	20% to 80% (noncondensing)
Storage	5% to 95% (noncondensing)
Maximum vibration:	
Operating:	0.25 G at 3 to 200 Hz for 15 minutes
Storage:	0.50 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 31 G for up to 2 ms
Storage (nonoperational)	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.)

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System Overview

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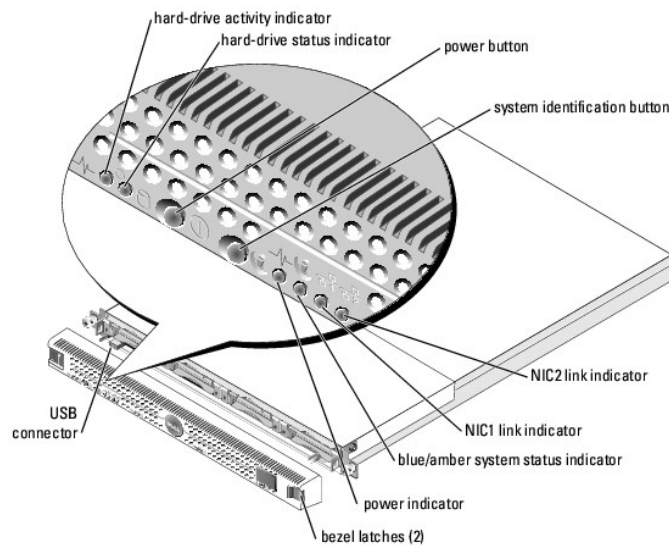
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- [Back-Panel Features](#)
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- [Operating System](#)
- [Power Protection Devices](#)
- [Other Documents You May Need](#)
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This section describes 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 that you may need to install and operate your system, as well as how to obtain technical assistance.

Front-Panel Features

[Figure 1-1](#) shows the front-panel features and indicators of the system. To remove the bezel and access the switches and indicators on the front panel, press the latch at each end of the bezel. See [Figure 1-1](#).

Figure 1-1. Front-Panel Features



The power button controls the power input to the system's power supply.

The two system identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed or the systems management software is used to identify the system, the blue system status indicators on the front and back of the system blink. (To stop the indicator from blinking, press one of the identification buttons a second time, or use the systems management software.)

The front panel also incorporates a USB 2.0 connector. See [Figure 1-1](#).

[Table 1-1](#) describes the indicators on the system front panel.

LED Indicator	Description
Blue/amber system status indicator	The blue system status indicator lights up during normal system operation. You can also use the systems management software to cause this indicator to flash to identify a particular system. The amber system status indicator flashes when the system needs attention due to a possible system problem.
Hard-drive activity indicator	The green hard-drive activity indicator flashes when the hard drives are in use.
Hard-disk status indicator	The green hard-drive status indicator lights up when the drive is ready and is functioning normally. The status indicator is off when the drive is absent and is not configured as part of a RAID or non-RAID volume and cannot be detected by the operating system or RAID controller. The green status indicator blinks when a volume of which the drive is a member is rebuilding. The amber status indicator blinks when a fault occurs with the drive.
NIC1 and NIC2 link indicators	The indicators for the two integrated network adapters lights if the network adapters are connected to the network. The indicators flash when data is being transmitted.
Power indicator	The green indicator flashes if AC power is available to the system, but the system is not powered on. The green indicator is on when the system is powered on. If the system is not connected to AC power, the green indicator is off.

Connecting External Devices

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

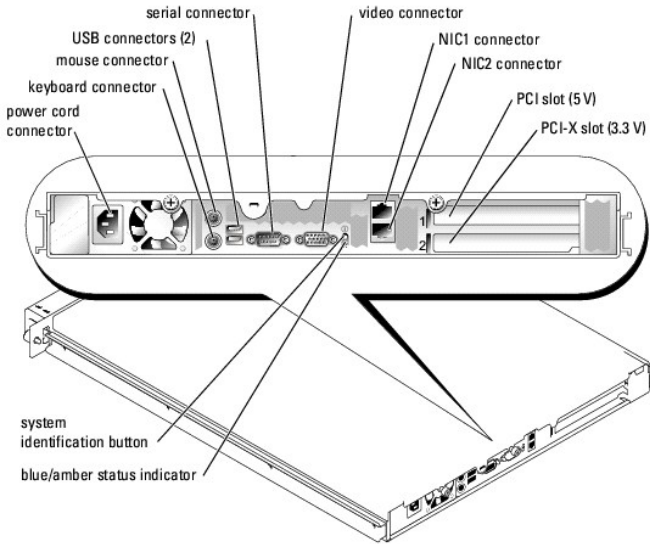
- 1 Most devices must be connected to a specific connector and device drivers must be installed before the device operates properly. (Device drivers are normally included with your operating system software or with the device itself.) Check the documentation that accompanied the device for specific installation and configuration instructions.
- 1 Always attach external devices while your system is turned off. Next, turn on any external devices before turning on the system (unless the documentation for the device specifies otherwise). If the system does not appear to recognize the device, try turning on the system before turning on the device.

For information about individual connectors, see "I/O 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](#)."

Back-Panel Features

[Figure 1-2](#) shows the back-panel features of the system.

Figure 1-2. Back-Panel Features



System Features

- 1 1-U rack-mountable chassis.
- 1 Intel® Pentium® 4 processor with a speed of at least 2.8 GHz and a front-side bus speed of 800 MHz, Intel Celeron® processor with a speed of at least 3.4 GHz and a front-side bus speed of 800 MHz, or an Intel Celeron processor with a speed of at least 2.4 GHz and a front-side bus speed of 400 MHz.
- 1 Support for software RAID, hardware RAID on the system, and hardware RAID on external storage systems.
- 1 A minimum of 512 MB of PC-3200 DDR400 SDRAM memory, upgradable to a maximum of 4 GB by installing memory modules in the four memory module sockets on the system board.
- 1 One 64-bit, 66-MHz 3.3 V PCI-X expansion slot and one 32-bit, 33-MHz 5 V PCI expansion slot. Both slots support full-height, half-length cards.
- 1 Optional daughter card drive controller supports up to four SATA hard drives.
- 1 Optional 39160 SCSI card for tape backup.
- 1 Optional external SCSI RAID solutions.
- 1 Optional SATA RAID solutions.
- 1 Optional remote access controller for remote systems management.
- 1 One 280 W power supply.
- 1 Two integrated Gigabit Ethernet network adapters, capable of supporting 10-Mbps, 100-Mbps, and 1000-Mbps data rates.
- 1 Three system cooling fans and two power-supply cooling fans.
- 1 Serial connector for console redirection support.
- 1 Security features, including chassis intrusion detection.
- 1 Systems management circuitry that monitors critical system voltages and temperatures. The systems management circuitry works with the systems management software.

For more information about specific features, see "[Technical Specifications](#)."

Software Features

- 1 Microsoft® Windows® Storage Server 2003, Standard Edition
- 1 Services for UNIX®, Novell® NetWare®, and Macintosh (integrated on the operating system)
- 1 Protocol support for TCP/IP, DHCP (client support), DNS (client support), NIS (client support), IPX, and AppleTalk
- 1 Disk management through Dell OpenManage™ Array Manager
- 1 Shadow Copies snapshot software
- 1 Diagnostics for evaluating your system's components and devices. For additional information about using the system diagnostics, see your Installation

and Troubleshooting Guide.

Operating System

Your system has a preinstalled operating system. See your system *Administrator's Guide* for information about using the operating system and the Web-based tool for managing the system.

Power Protection Devices

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

- 1 PDU — Uses circuit breakers to ensure that the AC current load does not exceed the PDU's rating.
 - 1 Surge protector — Prevents voltage spikes, such as those that may occur during an electrical storm, from entering the system through the electrical outlet. Surge protectors do not provide protection from brownouts, which occur when the voltage drops more than 20 percent below the normal AC line voltage level.
 - 1 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.
 - 1 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 shut down 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.

- 1 The *Rack Installation Guide* or *Rack Installation Instructions* included with your rack solution describes how to install your system into a rack.
- 1 The *Getting Started Guide* provides an overview of initially setting up your system.
- 1 The *Installation and Troubleshooting Guide* describes how to troubleshoot the system and install or replace system components.
- 1 The system *Administrator's Guide* provides system configuration, operation, and management information.
- 1 Systems management software documentation describes the features, requirements, installation, and basic operation of the software.
- 1 Documentation for any components you purchased separately provides information to configure and install these options.
- 1 Updates are sometimes included with the system to describe changes to the system, software, and/or documentation.



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

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

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* or the system *Administrator's 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 System Setup Program

Dell™ PowerVault™ 745N NAS Systems User's Guide

- [Entering the System Setup Program](#)
- [System Setup Options](#)
- [System and Setup Password Features](#)
- [Disabling a Forgotten Password](#)
- [Asset Tag Utility](#)

After you set up your system, run the System Setup program to familiarize yourself with your system configuration and optional settings. Record the information for future reference.

You can use the System Setup program to:


- 1 Change the system configuration stored in NVRAM after you add, change, or remove hardware
- 1 Set or change user-selectable options—for example, the time or date
- 1 Enable or disable integrated devices
- 1 Correct discrepancies between the installed hardware and configuration settings

Entering the System Setup Program

1. Turn on or restart your system.
2. Press <F2> immediately after you see the following message:


<F2> = System Setup

If your operating system begins to load before you press <F2>, allow the system to finish booting, and then restart your system and try again.

 **NOTE:** To ensure an orderly system shutdown, see your system *Administrator's Guide*.

Responding to Error Messages


You can enter the System Setup program by responding to certain error messages. If an error message appears while the system is booting, 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 errors.

 **NOTE:** After installing a memory upgrade, it is normal for your system to send a message the first time you start your system.

Using the System Setup Program

[Table 2-1](#) lists the keys that you use to view or change information on the System Setup program screens and to exit the program.

Keys	Action
Up arrow or <Shift><Tab>	Moves to the previous field.
Down arrow or <Tab>	Moves to the next field.
Spacebar, <+>, <->, left and right arrows	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.
<F1>	Displays the System Setup program's help file.

 **NOTE:** For most of the options, any changes that you make are recorded but do not take effect until you restart the system.

System Setup Options

Main Screen

When you enter the System Setup program, the main System Setup program screen appears. See [Figure 2-1](#).

Figure 2-1. Main System Setup Program Screen

```

Dell Inc. (www.dell.com) - Power Vault 745N
-----
Intel® Pentium® 4 Processor          BIOS Version: 1.07-023
Processor Speed: 2800 MHz           Service Tag :

System Time ..... 08:15:45
System Date ..... Fri Nov 7, 2003

System Memory ..... 512 MB ECC DDR
Memory Configuration ..... Dual Channel Mode
Video Memory ..... 8 MB SDRAM

OS Install Mode ..... Off
CPU Information ..... <ENTER>

Boot Sequence ..... <ENTER>
Hard-Disk Drive Sequence ..... <ENTER>
USB Flash Drive Emulation Type ..... Auto

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

Console Redirection ..... <ENTER>

System Security ..... <ENTER>

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

Asset Tag ..... J00000

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

```

[Table 2-2](#) lists the options and descriptions for the information fields that appear on the main System Setup program screen.

 **NOTE:** The System Setup program defaults are listed under their respective options, where applicable.

Option	Description
System Time	Sets the time on the system's internal clock.
System Date	Sets the date on the system's internal calendar.
System Memory	Displays the amount of system memory. This option does not have user-selectable settings.
Memory Configuration	Displays the memory configuration (single channel or dual channel mode).
Video Memory	Displays the amount of video memory. This option does not have user-selectable settings.
OS Install Mode (Off default)	Determines the maximum amount of memory available to the operating system. On sets the maximum memory to 256 MB. Off makes all of the system memory available to the operating system. Some operating systems cannot install with more than 2 GB of system memory. Enable this option (On) during operating system installation and disable (Off) after installation.
CPU Information (Logical Processor Enabled default)	Displays information related to microprocessors (speed, cache size, and so on). If a processor that supports HyperThreading is installed, you can enable or disable this feature.
Boot Sequence	Determines the order in which the system searches for boot devices during system startup. Available options can include the diskette drive, CD drive, hard drives, and network.
Hard-Disk Drive Sequence	Determines the order in which the system searches the hard drives during system startup. The selections depend on the hard drives installed in your system.
USB Flash Drive Emulation Type (Auto default)	Specifies the emulation type for the USB flash drive. Available options include Auto , Hard disk , and Floppy .

Integrated Devices	See " Integrated Devices Screen ."
PCI IRQ Assignment	Displays a screen to change the IRQ assigned to each of the integrated devices on the PCI bus, and any installed expansion cards that require an IRQ.
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 " and " Using the Setup Password " 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. Enable this option for host systems that have keyboards attached. Select Do Not Report to suppress 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 2-3](#) lists the options and descriptions for the information fields that appear on the **Integrated Devices** screen.

Option	Description
USB Controller (On with BIOS support default)	Enables or disables the system's USB ports. Options are On with BIOS support , On without BIOS support , or Off . Disabling the USB ports makes system resources available for other devices.
Embedded Gb NIC1 Embedded Gb NIC2	Enables or disables the system's integrated network adapters. Options are Enabled without PXE , Enabled with PXE , and Disabled . PXE support allows the system to boot from the network. Changes take effect after the system reboots.
Embedded Gb NIC1 MAC Address Embedded Gb NIC2 MAC Address	Displays the MAC address for each integrated network adapter. This field does not have user-selectable settings.
Serial Port (Auto default)	Serial port options are COM1 , COM3 , Auto , and Off . When the serial port is set to Auto , the integrated port automatically attempts to use COM1 first, and then COM3. If both addresses are in use, the port is disabled. If you set the 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.
Speaker (On default)	Sets the integrated speaker On or Off . A change to this option takes effect immediately (rebooting the system is not required).

System Security Screen

[Table 2-4](#) lists the options and descriptions for the information fields that appear on the **System Security** screen.

Option	Description
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 " for instructions on assigning a system password and using or changing an existing system password.
Password Status	Setting the Setup Password option to Enabled prevents the system password from being changed or disabled at system start-up. To <i>lock</i> the system password, assign a setup password in the Setup Password option and then change the Password Status option to Locked . In this state, you cannot change the system password using the System Password option and the system password cannot be disabled at system start up by pressing <Ctrl><Enter>. To <i>unlock</i> the system password, enter the setup password in the Setup Password field and then change the Password Status option to Unlocked . In this state, you can disable the system password at system start up by pressing <Ctrl><Enter> and then change the password using the System Password option.
Setup Password	Restricts access to the System Setup program in the same way that you restrict access to your system using the system password feature. NOTE: See " Using the Setup Password " for instructions on assigning a setup password and using or changing an existing setup password.
Power Button	Turns system's power off and on. <ol style="list-style-type: none"> If you turn off the system using the power button and the system is running an ACPI-compliant operating system, the system can perform an orderly shutdown before power is turned off. If the system is not running an ACPI-compliant operating system, power is turned off immediately after the power button is pressed. <p>The button is enabled in the System Setup program. When disabled, the button can only turn on system power.</p> <p>NOTE: You can still turn on the system using the power button when the Power Button option is set to Disabled. If the option setting is</p>

	changed to Disabled , the change will not take effect until the next system boot. The power button is enabled throughout POST and is disabled prior to the operating system booting.
Chassis Intrusion	If a remote access controller (RAC) is not installed in the system, this field enables or disables the chassis-intrusion detection feature. When this option is set to Enabled-Silent , chassis intrusions are detected, but a warning message is not 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 edit key. When a remote access controller is installed in the system, this option does not appear.
AC Power Recovery	If this option is set to On , the system automatically powers on if power is restored after a loss of power to the system. If this option is set to Last , the system returns to the state that it was in prior to the loss of AC power.
NMI Button	Enables or disables the nonmaskable interrupt (NMI) switch on the system board. If a trained service technician presses the NMI switch after a system lockup, the operating system copies the contents of system memory to the system hard drive for diagnostic purposes.

Console Redirection Screen

[Table 2-5](#) lists the options and descriptions for the information fields that appear on the **Console Redirection** screen.

Option	Description
Console Redirection (Off default)	Enables or disables the console redirection feature. If enabled, options are Serial Port 1 (if a remote access card [RAC] is not installed), or RAC (if a RAC is installed).
Remote Terminal Type (VT 100/VT 220 default)	Select either VT 100/VT 220 or ANSI .
Redirection After Boot (Enabled default)	Enables or disables console redirection after your system restarts.

Exit Screen

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

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

System and Setup Password Features

- ➔ **NOTICE:** The password features provide a basic level of security for the data on your system. If your data requires more security, use additional forms of protection, such as data encryption programs.
- ➔ **NOTICE:** Anyone can access the data stored on your system if you leave the 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.

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

To change or delete an existing password, you must know the password (see "[Deleting or Changing an Existing System Password](#)"). If you forget your 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*.

Using the System Password

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 after the system starts.

Assigning a System Password

Before you assign a system password, 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 setting shown for the **Password Status** 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, the system password is **Disabled**, and you cannot change or enter a new system password.


When a system password is not 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:

1. Verify that the **Password Status** option is set to **Unlocked**.
2. Highlight the **System Password** option and 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 is not case-sensitive. However, certain key combinations are not valid. If you enter one of these combinations, the system beeps. To erase a character when entering your password, press <Backspace>.

 **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 setting shown for the **System Password** changes to **Enabled**. Exit the System Setup program and begin using your system.

6. Either reboot your system now for your password protection to take effect or continue working.

 **NOTE:** Password protection does not take effect until you reboot the system.

Using Your System Password to Secure Your System

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

When the **Password Status** option is set to **Unlocked**, you have the option to leave the password security enabled or to disable the password security.

To leave the password security enabled:

1. Turn on or reboot your system by pressing <Ctrl><Alt>.
2. Press <Enter>.
3. Type your password and press <Enter>.

To disable the password security:


1. Turn on or reboot your system by pressing <Ctrl><Alt>.
2. Press <Ctrl><Enter>.

When the **Password Status** option is set to **Locked** whenever you turn on your system or reboot your system by pressing <Ctrl><Alt>, type your password and press <Enter> at the prompt.

After you type the correct system password and press <Enter>, your system operates as usual.

If an incorrect system password is entered, the system displays a message and prompts you to re-enter your password. You have three attempts to enter the correct password. After the third unsuccessful attempt, the system displays an error message showing the number of unsuccessful attempts and that the system has halted and will shut down. This message can alert you to an unauthorized person attempting to use your system.

Even after you shut down and restart the system, the error message continues to be displayed until the correct 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.

If you are asked to enter your setup password, contact your network administrator.


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 **Enabled** is displayed for the **System Password** option, press the <Alt> key combination to restart the system, and then repeat steps 2 through 5.

Using the Setup Password

Assigning a Setup Password

You can assign (or change) a setup password 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 beeps.

 **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.

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 is not case-sensitive. However, certain key combinations are not valid. If you enter one of these combinations, the system beeps. To erase a character when entering your password, press <Backspace> or the left-arrow key.


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 most of the System Setup options. When you start the System Setup program, the program prompts you to enter a password.

If you do not enter the correct password in three attempts, 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 through 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](#)."
-

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.

Assigning an Asset Tag Number

1. In the **NAS Manager** window, click **Maintenance**.
2. Click **Server Administrator**.

Log in to the **Server Administrator** page when you are prompted.

3. Click **Main System Chassis**.
4. Click the **Properties** tab, if the tab is not already open.
5. Click **Information link**.
6. Enter a value in the **Chassis Asset Tag** field and click **Apply**.

 **NOTE:** See your system *Administrator's Guide* for more information.

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



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



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

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