1 Server Description

The NEC ProServa™ PH133 series of high performance Pentium® 133 MHz servers incorporate a modular scaleable architecture that integrates a 64-bit bus interface with a Peripheral Component Interconnect (PCI) PeerBus and an Extended Industry Standard Architecture (EISA) bus. The architecture supports symmetrical multiprocessing (SMP) and a variety of operating systems. The bus interface is capable of handling multiple processors with multiple cache resources in a quad-processor format.

The ProServa PH server's system board provides two central processing unit (CPU) module slots, two Error Checking and Correcting (ECC) memory module slots, four PCI slots, and six EISA bus master slots. Four standard peripheral bays can house optional diskette drives, tape back-up, CD-ROM (standard on some configurations), and other mass storage devices. Six hot-docking bays provide over 12 gigabytes (GB) of storage. The docking bays allow hot-swapping of SCSI hard disk drives without shutting down the server.

All server configurations contain a 525-watt power supply, 3 1/2-inch diskette drive, ECC memory module, and CPU module. Several configurations contain two CPU modules, one or two 2-GB hard drives, an Intel EtherExpress™ PRO/100B Adapter board, CD-ROM reader, Intel LANDesk Server Monitor, and a redundant array of independent disks (RAID) controller. Figure 1-1 shows a typical server configuration. Table 1-1 lists the server configurations.

Monitoring and control of the ProServa PH servers is provided by an onboard Interrupt Control ASIC (INCA) component and several software applications, including Intel's LANDesk™ Server Control and LANDesk Management Suite.

As application requirements increase, you can upgrade your system with dual or quad Pentium processors, additional memory, additional drives and add-in expansion boards, and other peripheral devices.
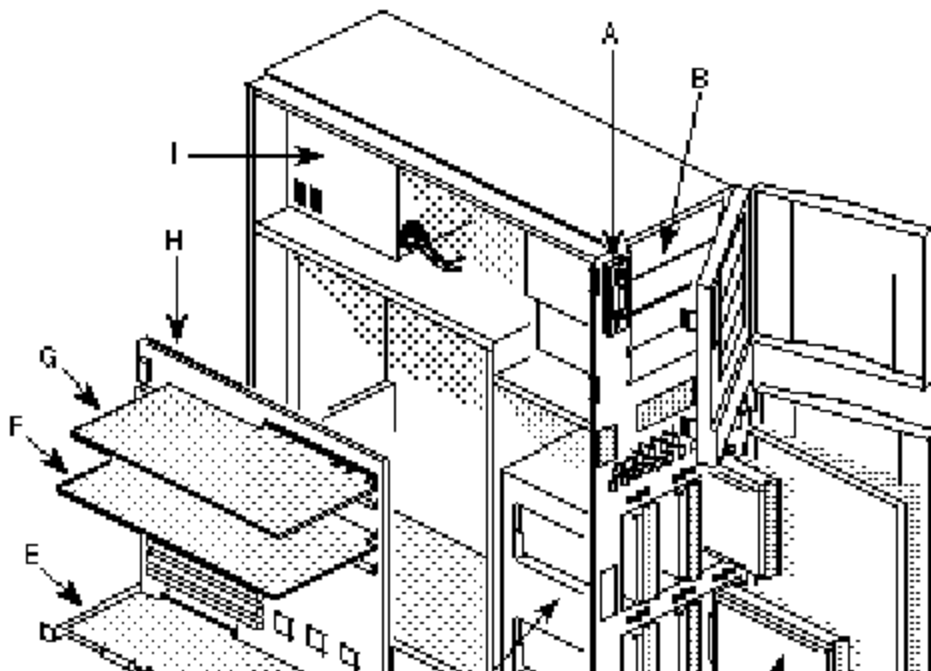
Figure 1-1. ProServa PH Server, Semi-exploded View

A ¾ 3 1/2-inch diskette drive

B ¾ 5 1/4-inch peripheral bays

C ¾ SCSI 3 1/2-inch hard disk drive

D ¾ SCSI Hot-docking bays

E ¾ PCI disk array controller board (high availability servers only)

F ¾ CPU module

G ¾ ECC memory module

H ¾ System board

I ¾ Power Supply

Table 1-1. ProServa PH Server Configurations

Server Model	Configuration
ProServa PH SMP-1/133 Base System	Intel Pentium 133-MHz single processor 32-MB ECC system memory 1-MB synchronous secondary cache per processor 3 1/2-inch diskette drive No hard disk
ProServa PH SMP-1/133 Network Ready System	Intel Pentium 133-MHz single processor 32-MB ECC system memory 1-MB synchronous secondary cache per processor Intel EtherExpress PRO/100B Adapter LAN board One, 2-GB Fast/Wide SCSI-2 hard disk 4X SCSI CD-ROM reader 3 1/2-inch diskette drive
ProServa PH SMP-2/133 Base System	Intel Pentium 133-MHz 2-way SMP processor 32-MB ECC system memory 1-MB synchronous secondary cache per processor 3 1/2-inch diskette drive No hard disk
ProServa PH SMP-2/133 Network Ready System	Intel Pentium 133-MHz 2-way SMP processor 32-MB ECC system memory 1-MB synchronous secondary cache per processor Intel EtherExpress PRO/100B Adapter LAN board One, 2-GB Fast/Wide SCSI-2 hard disk 4X SCSI CD-ROM reader 3 1/2-inch diskette drive

ProServa PH SMP-2/133 High Availability System	Intel Pentium 133-MHz 2-way SMP processor 32-MB system memory 1 MB synchronous secondary cache per processor Intel EtherExpress PRO/100B Adapter LAN board Two, 2-GB Fast/Wide SCSI-2 hard disks 4X SCSI CD-ROM reader LANDesk Server Monitor Module 2-channel PCI Raid Module 3 1/2-inch diskette drive
ProServa PH SMP-4/133 Network Ready System	Intel Pentium 133-MHz quad-processors 64-MB ECC system memory 1-MB synchronous secondary cache per processor Intel EtherExpress PRO/100B Adapter LAN One, 2-GB Fast/Wide SCSI-2 hard disk 4X SCSI CD-ROM reader 3 1/2-inch diskette drive
ProServa PH SMP-4/133 High Availability System	Intel Pentium 133-MHz quad-processors 64-MB ECC system memory 1-MB synchronous secondary cache per processor Intel EtherExpress PRO/100B Adapter LAN Two, 2-GB Fast/Wide SCSI-2 hard disks 4X SCSI CD-ROM reader LANDesk Server Monitor Module 2-channel PCI RAID Module 3 1/2-inch diskette drive

Standard Server Features

Table 1-2 describes the server's standard features.

Table 1-2. Standard Server Features

Feature	Description
Two-Segment PCI Bus	Fully PCI 2.1 compliant bus performance at 33 MHz with a bandwidth of up to 133 MB/second. The two 32-bit segments provide maximum system performance.
EISA Bus	Fully EISA 3.12 compliant bus performance at 8.33 MHz with a bandwidth of up to 33 MB/second.
Single to 4-Way Pentium Processor Support	Two CPU module expansion slots support up to two CPU modules, each containing up to two Pentium processors. Dual/quad processing enhances system performance and enables symmetric multiprocessing (SMP) on supported operating systems. Onboard L1 cache has 8K each for code and data.
Advanced Programmable Interrupt Controller (APIC)	APIC controls interrupt detection and notification, and is used in conjunction with SMP. Use of APIC reduces the load on the system bus, as the APIC uses a serial bus to transmit and receive interrupts.

Interrupt and Control ASIC (INCA)	Onboard Interrupt and Control ASIC (INCA) provides PCI interrupt control. An integrated automatic APIC sensor is capable of full dual-Pentium and quad-Pentium processor symmetric multi-processing support. An INCA component provides support for PCI arbitration, interrupt steering, and a second I/O APIC. It also drives the front panel interface and LCD display for security and server management functions. A System Management Interrupt (SMI) component monitors the keyboard, mouse, system board voltages and temperatures, and server door opening.
Programmable Watchdog Timer (p/o INCA)	Detects software or hardware failures and, after a preset time limit, generates an asynchronous system reset (ASR) signal to automatically reset the server (equivalent to a hard reset).
Secondary Cache	1-MB L2 synchronous cache for each CPU module; cache is not shared in SMP.
Memory Modules with Upgradeable Memory	Two memory module expansion slots on the system board support up to two ECC (Error Checking and Correcting) memory modules. The modules provide automatic error correction of all single bit errors and detection of all double bit errors. Each module supports up to 384 MB of 70 ns, fast page mode, 36-bit SIMMs.
Add-in Expansion Board Support	Expansion slots for up to eight add-in boards, including four EISA slots, two PCI slots, and two shared PCI/EISA slots.
PCI Controller	Onboard PCI controller controls the system board's two dedicated PCI slots and two shared PCI/EISA slots. Also provides interface between processor and PCI bus, and a bridge between the PCI bus and EISA bus.
SCSI Controllers	Two integrated PCI-based Adaptec SCSI-2 AIC-7870 controllers (channels A and B) on the system board support up to seven 8-bit narrow SCSI devices or up to fifteen 8-bit narrow and/or 16-bit wide SCSI devices. Features 32-bit PCI bus master interface for maximum bus transfer rates.
Advanced I/O Peripheral Controller	Integrated Intel 82091AA controller on the system board supports 3 1/2-inch and 5 1/4-inch diskette drives, two 8/16-bit integrated drive electronic (IDE) hard drives, a parallel port, and two serial ports.
Video Controller	Integrated Cirrus Logic CL-GD5424 super VGA controller shipped with 512 KB, 70 ns video memory (upgradeable to 1 MB).
Real-time Clock Module	Real-time clock (RTC) module with integrated lithium battery and 8 KB of non-volatile random access memory (NVRAM).
External Device Connectors	I/O riser board on system board has connectors for two serial ports, parallel port, PS/2™ compatible keyboard and mouse, and VGA monitor.
Flash Memory BIOS	Flashable memory device contains system BIOS, SCSI BIOS, EISA configuration utility (ECU), video BIOS, power-on self-test (POST), video BIOS, PCI/EISA configuration information, and BIOS recovery utility.

SCSI-2 Single Connector Attachment (SCA) Compatible Backplane	Provides a continuous fast/wide SCSI bus for access to all hot-swap drive bays. Allows SCSI-1 (5 MB/sec), fast/narrow SCSI-2 (10 MB/sec), or fast/wide SCSI-2 (20 MB/sec) data transfers to the hard drives.

Additional details are given in Appendix C, "Technical Reference."

Chassis

The server system's electro-galvanized metal chassis minimizes EMI/RFI. The chassis contains:

- auto-ranging 525 watt power supply/fan unit that automatically switches between 110 Vac and 220 Vac

- two variable-speed hot-swap fans for interior cooling, with speed determined by interior air temperature and number of installed hard drives

- standard 3 1/2-inch diskette drive bay for the installed 1.44-MB diskette drive

- four standard 5 1/4-inch bays for mounting half-height peripheral devices (CD-ROM, diskette drive, tape drive)

- all configurations except base ship with a CD-ROM drive installed in the bottom slot

- six hot-docking bays for mounting SCSI-2 SCA 3 1/2-inch full height hard disk drives

- all configurations except base ship with one or two 2-GB hard disks installed in the hot-docking bay

- ten I/O expansion slots (slot closest to bottom of chassis has no corresponding connector on the system board).

Two captive thumbscrews secure the removable metal door behind the lower plastic front door to the chassis. The cover provides proper air-flow and easy access to the hot-docking bays for hot-swapping SCSI-2 SCA hard disk drives in and out of the server. The removable side cover, attached to the chassis with four screws, provides proper airflow and easy access to the system board. You can secure the cover to the chassis and the hot-docking bay metal door to the chassis with padlocks (not provided). Figure 1-2 shows the major system components.
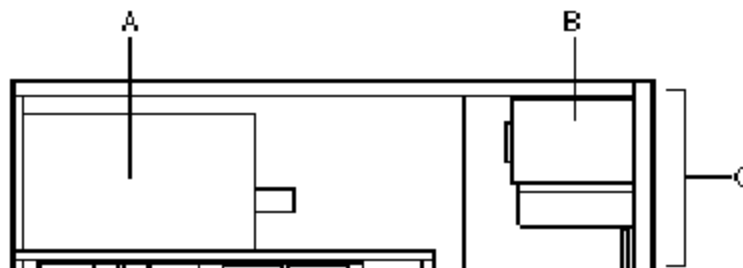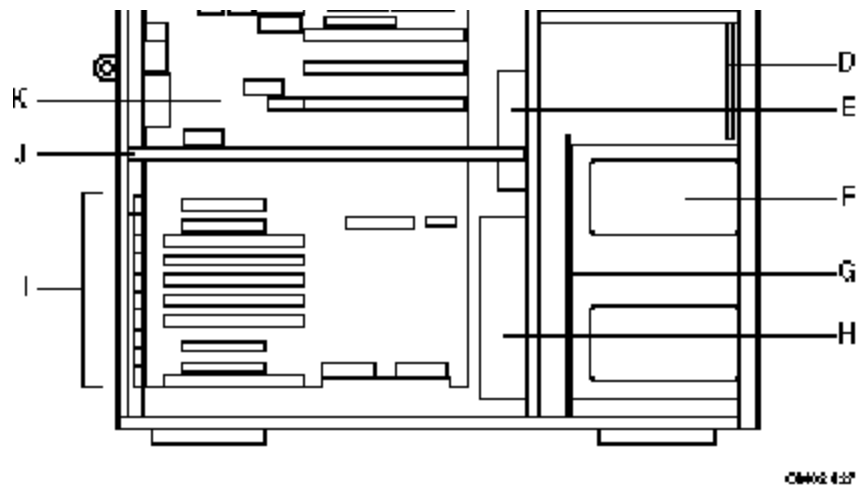
Figure 1-2. Server, Side View

A ¾ Power supply with integrated fan

B ¾ 3 1/2-inch diskette drive and vertical peripheral bay

C ¾ Four, 5 1/4-inch external horizontal peripheral bays

D ¾ Front panel board

E ¾ Fan 1

F ¾ Six, hot-docking vertical peripheral bays

G ¾ SCSI hot-docking backplane

H ¾ Fan 2 and card guide support panel

I ¾ Ten I/O expansion slot covers

J ¾ Module retaining bracket

K ¾ System board

Controls and Lights

Figure 1-3 shows the front panel door (opened), front panel, locations of server controls and lights, four external peripheral bays, and the 3 1/2-inch diskette drive. The controls and lights include:

Diskette drive ejector button: when pressed, ejects the disk.

Diskette drive activity light: when lit, indicates the drive is in use.

DC power push-button switch: when pressed, turns the system DC

power on or off.

Reset push-button switch: when pressed, resets the system and causes the power-on self test (POST) to run.

Front panel status lights:

> Top light (power on/off): when lit, indicates the presence of DC power in the system. The light goes out when the power is turned off or the power source is disrupted.

> Second light from top: when lit, indicates an IDE hard disk drive or SCSI device on channel A is in use.

> Third light from top: when lit, indicates a SCSI device on channel B is in use.

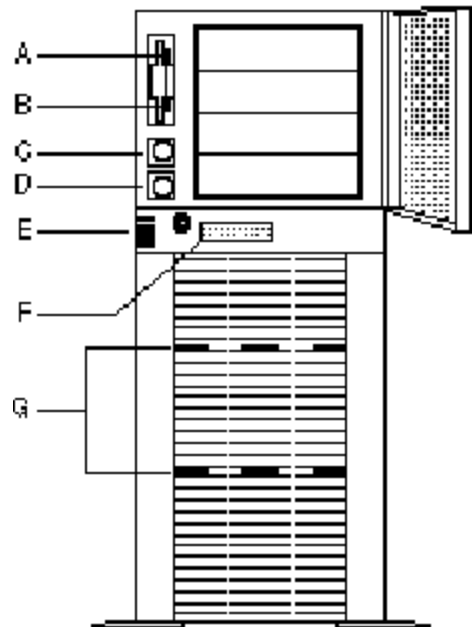> Bottom light: when lit, indicates drive fault.

LCD panel: when enabled, displays system information.

Hot-docking bay status lights (one set per hard drive):

> Left light: when on continuously, indicates drive present and power on.

> Middle light: when flashing, indicates drive activity.

> Right light: when on continuously, indicates drive fault.

Figure 1-3. Server Controls and Lights

A ¾ Diskette drive ejector button

B ¾ Diskette drive activity light

C ¾ DC power switch

D ¾ Reset switch

E ¾ Front panel status lights

F ¾ LCD display

G ¾ Hot-docking bay status lights

Server Security

The server system comes with a security key lock mounted in the upper front door panel. The keys to the lock are in a plastic bag taped to the inside of the door.

To prevent unauthorized entry or use of the server, you can:

secure the side cover and the hot-docking bay metal door to the chassis by inserting padlocks (not provided) through the metal tabs protruding through slots in the cover and door

lock the front panel door to prevent access to the power and reset push-button switches

set server administrative and user passwords

set secure mode to prevent keyboard or mouse input and to prevent use of the front panel controls.

Use the System Configuration Utility (SCU) to:

enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time-out period (1 to 128 minutes)

set an administrative password

set a user password

activate the secure mode hot-key

disable writing to the diskette drive.

If you set the user password, but not the administrative password, the BIOS requires you to enter the user password before you can boot the server or run the SCU. If you set both passwords, entering either one lets you boot the server or enable the keyboard and mouse. Only the administrative password lets you change the system configuration with the SCU.

The secure boot mode allows the system to boot and run the operating system (OS). However, you cannot use the keyboard or mouse until you enter the user password.

If you set a hot-key combination, you can secure the server immediately.

For additional security, two microswitches mounted on the floor plate of the server, near the side cover and hot-docking bay door, transmit warnings to the system board. Through software, they alert the user of unauthorized activity.
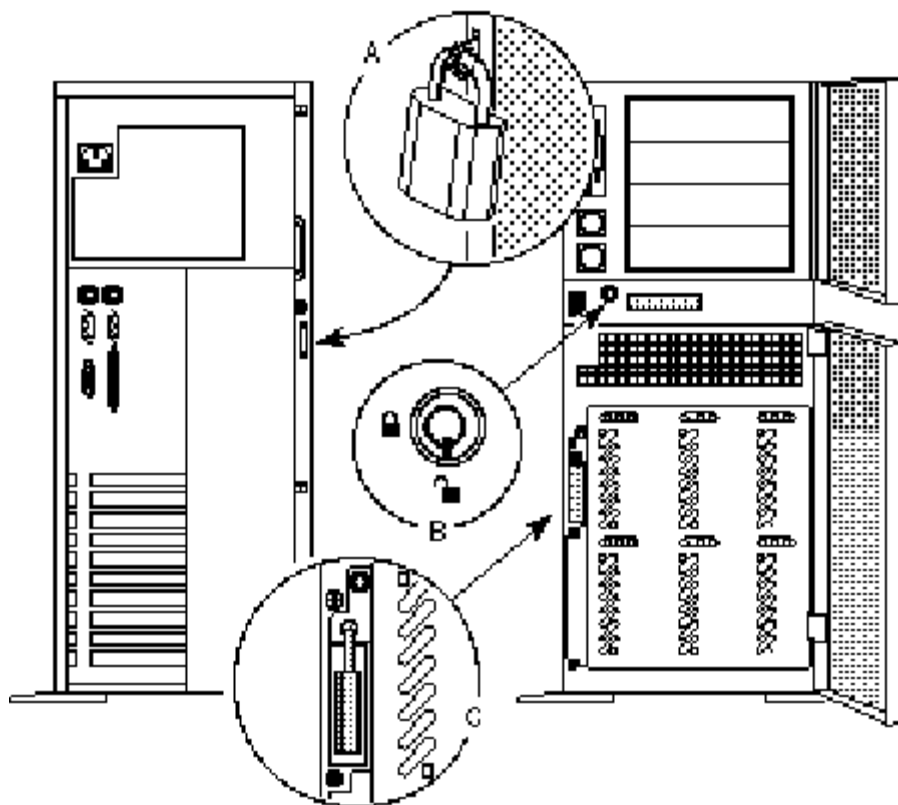
Figure 1-4. Server Security Locks

A ¾ Side cover lock

B ¾ Front panel door lock

C ¾ Inner door lock

Power Supply

The auto-ranging 525 watt power supply, designed to minimize electromagnetic interference (EMI) and radio frequency interference (RFI), provides sufficient power for the system. The power supply automatically switches between these input voltage ranges:

100-120 VAC at 50/60 Hz; 12 A maximum current

200-240 VAC at 50/60 Hz; 7 A maximum current

The power supply has three DC peripheral connectors for the accessible drive bays, two mini-output connectors for use with the 3 1/2-inch diskette drives, one TTL output connector for use with 5 1/4-inch peripherals or a
3 1/2-inch hard drive, and a separate connector that provides power directly to the SCSI-2 SCA backplane.

An integral 35 cubic feet per minute (cfm) fan cools the power supply and helps to cool the interior of the server.

EISA Expansion Slots

The six EISA bus slots on the system board provide for expansion and performance enhancement. Two of these slots share a common chassis I/O expansion slot with two of the PCI slots. If you use these EISA slots, you cannot use the PCI slots and visa versa.

All six slots have the capability of being bus masters. When EISA masters arbitrate for the bus, not all slots are created equal. The following pairs of slots share arbitration requests: 1 and 2, 3 and 4, and 5 and 6. Therefore, in the scheme of letting EISA masters take over the bus, ownership of it occurs in the following sequence: 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, 1, 2, 3, 4, 5, 6, etc.

The EISA bus, an extension of the Industry Standard Architecture (ISA) bus, provides:

32-bit memory addressing

Type A transfers at 5.33 MB per second

Type B transfers at 8 MB per second

burst transfers at 33 MB per second

8-, 16-, or 32-bit data transfers

automatic translation of bus cycles between EISA and ISA masters

interrupt sharing.

Since EISA is fully backward compatible with ISA, you can install old or new ISA

add-in boards and software in your server.

PCI Expansion Slots

The four PCI bus slots on the system board provide for expansion and performance enhancement.

One slot is in line with a processor module slot; if you install a processor module in this slot, you cannot use the PCI slot.

Two slots share a common chassis I/O expansion slot with two EISA slots. If you use these PCI slots, you cannot use the EISA slots.

The 32-bit PCI bus is a two-segment PCI PeerBus that provides:

   32- and 64-bit memory addressing

   + 5 V and + 3 V signaling environments

   burst transfers at 133 MB per second

   8-, 16-, or 32-bit data transfers

   plug-and-play configuration

   PCI PeerBus to maximize throughput.

Peripheral Bays

The server system contains a total of eleven peripheral bays.

   The six 3 1/2-inch full-height hot-docking bays support industry standard SCA SCSI hard disk drives. They allow easy setup of Redundant Array of Inexpensive Disks (RAID) applications.

   The four 5 1/4-inch half-height bays provide space for backup or removable media devices.

   The vertical 3 1/2-inch bay contains a 3 1/2-inch diskette drive that supports both 720 KB and 1.44 MB media.

Onboard Super VGA Video Controller

The onboard, integrated Cirrus Logic CL-GD5424 super SVGA controller is fully compatible with the CGA, EGA, Hercules Graphics, MDA, and VGA video standards. The standard system configuration comes with 512 KB of onboard video memory, allowing pixel resolutions of 640 x 480 and 800 x 600 in 256 colors, and 1024 x 768 x 16 colors. The SVGA controller supports only analog monitors (single and multiple frequency, interlaced and noninterlaced) with a maximum vertical retrace interlaced frequency of 87 Hz.

By increasing the buffer size of the onboard video memory from 512 KB to 1 MB (with one, 40-pin 256 K x 16, 70 ns fast-page DRAM), the controller can support 132-column text modes and high resolution graphics with a maximum of 1024 x 768 x 64 K colors. It also provides hardware accelerated bit block transfers (BitBLT) of data.

SCSI Controller

The system board includes two PCI-based Adaptec AIC-7870 fast/wide SCSI-2 controllers (channels A and B) integrated as 32-bit PCI bus masters. The controllers support data path widths of 8-bit (narrow SCSI) at a data transfer rate of 10 MB/sec and 16-bit (wide SCSI) at a data transfer rate of 20 MB/sec. As PCI bus masters, these controllers support data transfer rates of 133 MB/sec.

You can connect up to seven 8-bit narrow SCSI devices or up to fifteen 8-bit narrow and/or 16-bit wide SCSI devices and one controller (maximum of seven 8-bit narrow devices) to each channel. The devices include, for example, tape drives, printers, optical media drives, and others.

The SCSI controller provides active negation outputs, controls for external differential transceivers, a disk activity output, and a SCSI terminator power-down control.

Active negation outputs reduce the chance of data errors by actively driving both polarities of the SCSI bus and avoiding indeterminate voltage levels and common-mode noise on long cable runs. The SCSI output drivers can directly drive a 48 mA, single-ended SCSI bus with no additional drivers.

No additional logic, termination, or resistor loads are required to connect up to seven 8-bit narrow SCSI devices or up to fifteen 16-bit wide SCSI devices to each SCSI-2 channel on the system board.

SCSI-2 SCA-Compatible Backplane

The SCSI-2 SCA backplane for the ProServa PH is configured as two SCSI continuous fast/wide SCSI buses (A and B) for connecting all hot-swap SCA-compatible hard drives installed in the hot-swap bays. This allows fast drive installation and removal, as each hard drive plugs directly into a SCA connector on the backplane. The backplane also acts as the termination point for all installed SCSI hard drives and sets the hard drive IDs.

The backplane also supports up to three SCSI devices installed in the 5 1/4-inch bay, including the installed SCSI-2 CD-ROM reader. The SCSI-2 SCA backplane supports fast/wide SCSI-2 (20 MB per second) data transfers to the 3 1/2-inch hard drives. The backplane also supports SCSI-1 (5 MB per second) and fast/narrow SCSI-2 (10 MB per second) devices. See Chapter 5, "SCSI Hot-docking Backplane," for information on configuring the backplane.

ECC Memory Module

The server system comes with one ECC memory module installed. The module provides up to 384 MB of high-speed memory (see Table 1-1 for system memory configuration). If you need more memory, you can install an additional optional ECC

memory module. The two modules provide up to 768 MB of high-speed memory.

Each module has three memory banks. Each bank consists of four SIMM sockets. Each socket can hold an 8, 16, or 32 MB approved fast-page parity SIMM. You can install any size SIMM in any bank but all four SIMMs in a bank must be the **same size**. SIMM height must not exceed **one inch**; taller SIMMs will interfere with an adjacent CPU module or ECC memory module.

The ECC memory module detects and corrects single-bit errors from DRAM (Dynamic Random Access Memory) in real time, allowing your system to function normally. It detects all double-bit errors but does not correct them. It also detects all three-bit and four-bit adjacent errors in a DRAM *nibble* but does not correct them. When one of these multiple-bit errors occurs, the ECC memory module generates an NMI (NonMaskable Interrupt) and usually halts the system. The data transfer width of the ECC memory module is 64/128 bits. It is compatible with all Pentium processor modules.

The server supports both base (conventional) and extended memory. Base memory is located at addresses 00000H to 9FFFFH (the first 640 KB). Extended memory begins at address 100000H (1 M) and extends to the limit of addressable memory (4 G).

Some operating systems and application programs use base memory (for example, MS-DOS, OS/2, and UNIX). Other operating systems use both conventional and extended memory (for example, OS/2 and UNIX).
MS-DOS does not use extended memory. However, some MS-DOS utility programs such as RAM disks, disk caches, print spoolers, and windowing environments use extended memory for better performance.

CPU Module

The server system board accepts one or two CPU modules, each capable of supporting one or two Pentium processors. Depending on system configuration, the module(s) contain single or dual Pentium processors and a memory bus controller (see Table 1-1 for system CPU module configurations).

The dual processor module provides a symmetric multiprocessing (SMP) environment. In SMP, all processors are equal and have no preassigned tasks. Distributing the processing loads between both processors increases system performance. This is particularly useful when application demand is low and the I/O request load is high. In the SMP environment, both processors share a common bus, the same interrupt structure, and access to common memory and I/O channels. The SMP implementation conforms to MP Specification Version 1.4.

The CPU modules are compatible with all 32-bit software written for the Intel386Ô , Intel486Ô , and Intel Pentium processors. Operating system support includes Novell NetWare, MS-DOS, and Windows NT.

The single Pentium processor module uses the Intel 82497 cache controller and Intel 82492 SRAM components to provide 512 KB of zero wait state two-way associative cache.

The dual Pentium processor module uses the Intel 82498 cache controller and Intel 82493 SRAM components to provide 1 MB of zero wait state two-way associative

cache for each processor.

Contact your NEC sales representative or dealer for a list of CPU modules available for your server.

EtherExpress PCI PRO 100B LAN Adapter Board

The Intel EtherExpress PCI PRO 100B local area network (LAN) Adapter board (standard on all configurations except base) connects to your local network via unshielded twisted pair (UTP) wire. The UTP connects to a single RJ-45 connector on the adapter board at the back of the system.

The PRO 100B Adapter board and supporting software extends the performance of the ProServa PH servers onto the LAN. A 32-bit architecture and features like Early Receive Interrupt and Suspend/Resume ensure that data flows at top speeds on and off the LAN. Additionally, as the PRO 100B high performance capabilities minimize use of the server's processor, the ProServa PH has more computing power for even the most demanding applications and operating environments.

The 100-MB adapter board runs at 10 Mbps or 100 Mbps, depending on the speed of the hub port to which the adapter is attached. This permits the server to take full advantage of its high performance, high speed PCI bus.

The Adapter board is switchless and is Plug and Play compatible. The board has 16 KB of onboard memory, an Intel 82556 controller, uses INTA interrupt levels, and incorporates a Bus Master DMA data transfer mode.

A link (LNK) LED on the board indicates when the adapter is connected to a hub or switch and is receiving link pulses. An activity (ACT) LED on the board indicates read/write activity on the network. A lit yellow LED indicates that the board is operating at 10 Mbps and a lit green LED indicates that the board is operating at 100 Mbps. The adapter auto-detects 10 or 100 Mbps operation.

Additional information on the adapter is given in the help files included with the board and in Appendix I, "PRO 100B LAN Adapter Board."

CD-ROM Reader

All servers except the base configurations ship with a quad-speed SCSI-2 CD-ROM reader installed in the bottom slot of the 5 1/4-inch accessible bay. The reader is used to load and start programs from a CD disc.

CD-ROM operational information is given in Section 2, "Installing Your Server." Connector and jumper information is included in Appendix F, "Quad-Speed CD-ROM Reader."

LANDesk Server Monitor Module

The LANDesk Server Monitor Module (standard on high availability configurations, optional on all others) is a hardware/software server management application (for use with Novell NetWare 3.1x or 4.x). The application monitors the behavior of your server over a network or an optional modem. The Server Monitor Module monitors over a hundred different server parameters. This allows you to identify trends, both positive

and negative, on server behavior.

You can track such parameters as CPU use, disk reads, and cache buffers. You can also monitor server physical parameters (temperature, power supply voltage) and receive information about server status, even when the server or network is down. If you add a PCMCIA modem to the serial port of the server monitor module, you can monitor, configure, and set up the server from a remote site.

The Server Monitor Module works in conjunction with the Interrupt Controller APIC on the system's board but works independent of the LANDesk Server Control shipped with your server. LANDesk Server Control allows server monitoring and control at the server itself.

CAUTION

> If you are using both applications, you should use caution in your settings as the two applications do not interact together. See Appendix E, "LANDesk Server Control," for application interaction and a comparison between the LANDesk Server Monitor Module and LANDesk Server Control.

The LANDesk Server Monitor Module consists of Server Monitor software, a Monitor Module ISA board with a rechargeable battery backup power source, and a thermal probe. The Monitor Module board plugs into one of the EISA/ISA expansion board slots in your server. The probe is used to monitor critical temperatures, and can be positioned in a location of your choice.

For details on the installation and use of the LANDesk Server Monitor Module and thermal probe, refer to the documentation included with the Module.

Mylex Disk Array Controller

The Mylex Disk Array Controller (standard on high availability configurations, optional on all others) is a caching PCI SCSI Redundant Array of Independent Disks (RAID) controller that provides a data redundancy technique for distributing data across hard drives. The array controller supports RAID levels 0, 1, and 5.

The controller uses this technology to connect up to seven SCSI hard disk drives simultaneously on each of up to two channels. This allows continued operation of the server without loss of data if a hard drive fails. If a drive fails, read and write requests are serviced by standby hot-spare drives in the array.

For further information on the Disk Array Controller, including installation and operation procedures, refer to the Mylex Disk Array Controller User's Manual supplied with the controller.

Network Applications Software

All server configurations come with the following Intel network application software ready for installation on your system:

LANDesk Management Suite

LANDesk Server Control.

Both applications require loading on your system's hard disk, and can only be used with Novell NetWare 3.1x or 4.x. See the application's documentation for complete installation and operation procedures.

Each application is briefly described in the following paragraphs.

LANDesk Management Suite

All server configurations come with the Intel LANDesk Management Suite. The LANDesk Management Suite consists of four categories of network tools:

> workstation management tools – enables you to easily manage the workstations on your network

> server management tools – enables you to manage the file servers on your network

> wire management tools – enables you to monitor the traffic on your network

> network services tools – provides services on your network or enables you to manage the services available on your network.

The Workstation Management tools include Software Metering, Software Distribution, Desktop Manager, and Desktop Remote modules. The Software Metering module allows you to monitor and control license limits for network applications. The Software Distribution module allows you to easily distribute software to workstations on your local area network from a central location. The Desktop Manager module allows you to remotely access and obtain diagnostic information about the workstations on your network. The Desktop Remote module gives you complete control of a Windows workstation from a remote location through a modem and phone line.

The Server Management tools include Server Monitor and Server Status modules. The Server Monitor module tracks and graphs server parameters. The Server Status module monitors the binderies of up to eight types of servers, either individually or all eight at once.

The Wire Management tools includes a Traffic Monitor, Performance Monitor, and Software Probe. The Traffic Monitor tracks and displays network traffic information. The Performance Monitor tracks network traffic to provide statistical information about what applications are running on the network. The Software Probe gathers data for the traffic monitor and performance monitor.

The Network Services tools includes a Virus Scan tool, Network Printer Manager, and Queue Monitor. The Virus Scan tool allows automatic scanning of all workstation hard disks and server volumes. The Network Printer Manager provides access and management of all network printers run under Windows. The Queue Monitor manages network print queues.

For installation and operating details, refer to the included LANDesk Management

Suite documentation.

LANDesk Server Control

All server configurations come with the Intel LANDesk Server Control application (for use with Novell NetWare 3.1x or 4.x only), ready for installation on your system. The Server Control application software operates as a background task that continuously monitors the system until an error event occurs.

The Server Control application monitors and controls critical system hardware conditions on the ProServa PH server. The INCA component on the baseboard provides access to information such as temperature, voltage, chassis intrusion (where applicable), and cooling fan status.

The application makes this information available locally through the Server Control's Local Console and remotely through Simple Network Management Protocol (SNMP). The Local Console allows you to set monitoring thresholds on this data to automatically broadcast an alert, display a message, beep the speaker, initiate a shut-down, or hard reset the system.

The LANDesk Server Control application also controls the INCA watchdog timer that is used to automatically reboot the server after a system crash.

Major components of the LANDesk Server Control include the Local Console Application and the SNMP Translator. The Local Console Application provides the user interface for setting thresholds, reading current status, and setting events for Server Control. The Application uses the Management Interface of the service layer for low-level interactions with the system management hardware.

The SNMP Translator is a service layer management application and a sub-agent of the NetWare Extensible SNMP agent. It also uses the service layer to get and set management data.

For installation and operating details, refer to the "LANDesk Server Control - Getting Started Guide," the electronic help files provided with the Server Control, and Appendix E, "LANDesk Server Control," in this guide.

System Expansion

As application requirements increase, you can expand the server with the following options:

additional memory

Pentium processor upgrades

storage devices (tape drive, CD-ROM, diskette drive, hard disk drives)

Intel EtherExpress PRO/100 LAN Adapter board (standard on network ready and high capacity configurations)

LANDesk Server Monitor Module (standard on high capacity configurations)

Mylex Disk Array RAID Controller (standard on dual and quad processor high availability configurations).

Descriptions of the adapter board, monitor module, and RAID controller are included earlier in this chapter.

Memory Expansion

All servers except the quad-processor configurations come standard with one memory module containing 32 MB (four 8-MB SIMMs) of high speed SIMM memory. The network ready and high availability quad-processor configurations come standard with one memory module containing 64 MB (eight 8-MB SIMMs) of SIMM memory.

Memory can be expanded up to 384 MB on a single module or up to 768 MB using two modules. Optional SIMMs are installed in SIMM sockets on the memory modules. Optional 8-, 16-, and 32-MB SIMMs (36-bit, 70 ns) are available from NEC.

See Chapter 7, "Installing System Options," for further information and installation instructions.

Storage Device Expansion

The server supports optional IDE storage devices, fast/narrow SCSI-2 devices, or fast/wide SCSI-2 devices, including:

up to four 5 1/4-inch form factor IDE or SCSI storage devices (diskette, hard disk drive, tape, CD-ROM) in the top front panel bay

up to six 3 1/2-inch, 1-inch height, SCSI-2 SCA hard disk drives in the bottom front hot swap bay.

See Chapter 4, "Taking Your System Apart," for information on installing optional 5 1/4-inch storage devices. See Chapter 6, "Hot Swapping SCSI Hard Drives," for information on installing and swapping hard drives.

BIOS and System Configuration Utility

Hardware configuration takes place during the BIOS Power-On-Self-Test (POST) and PCI and ISA Plug-and-Play auto configuration. You can modify the hardware configuration using the bootable System Configuration Utility (SCU).

The SCU displays a series of system parameters, including system memory, IDE controller, SCSI controller, serial and parallel ports, and passwords. You can select the appropriate option of each parameter for your application. When finished, save the configuration to CMOS RAM and NVRAM. The system reboots with the new configuration parameters.

Table 1-3 summarizes BIOS and SCU features. See Chapter 3, "Using System Utilities," for information on using the SCU.

Table 1-3. BIOS and SCU Feature Summary

Feature	Description
Error detection	During initialization, system emits beep codes (before video initialization) and displays messages to identify problem.
Critical event logging	Provides information for applications and drivers, such as POST error codes, date/time area was last erased, and identification of failed SIMMs.
Security	The SCU provides several ways to secure the system. User password enables viewing SCU configuration. Administrator password enables changing configuration. Inactivity timer blanks screen and inhibits keyboard and mouse after specified time elapses. Hot-key immediately blanks screen and inhibits keyboard and mouse.
Boot sequence control	Offers choice of booting from diskette or hard drive or both in a specified order.
BIOS recovery	Allows booting from a diskette if BIOS ROM is corrupted, and automatically reinstalls BIOS.
BIOS update	Flash Memory Update (FMUP) utility updates BIOS with a new version from diskette.
Language update	Flash Language Update (FLUP) utility installs versions of the BIOS and SCU in languages other than English.
Custom logo	Enables creating and displaying a custom logo when SCU is executed from diskette.

See Chapter 3, "Using System Utilities," for additional information on using the SCU, recovering the BIOS, and updating the BIOS.