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History of Innovation and Value-Add in Compaq Server Families

Abstract: Compaq systems offer features that differentiate them from the competition. This trend was already well established when Compaq introduced the first server-class systems and has continued since that time. The number and variety of options and features available for Compaq servers has grown rapidly. Though most of the features described in this paper are OS independent, not all of the features are available on every OS. This white paper is intended to help you understand the options and features available on Compaq servers and provides information about Compaq server products and the options available for Compaq servers. It also provides historical reference to features found in previous generations of Compaq servers to communicate the rich heritage of Compaq innovation and leadership in industry standards.

This document supercedes and updates previous white papers entitled *Compaq Value Add Features and Server Families*.

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History of Innovation and Value-Add in the Compaq Server Families
Integration Note prepared by OS Integration Group

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Overview

Compaq products provide you with innovations designed to enhance the quality, reliability, maintainability, performance, and Total Cost of Ownership (TCO). These innovations are evident in the hardware, software, and service products that Compaq offers. Even the Compaq quality pledge reflects the commitment to listen to you in order to deliver the highest quality products, services, and solutions to ensure value and contribute to your success.

Compaq products pioneer new technologies subsequently adopted as industry standards. Features like Automatic Server Recovery once found only on Compaq servers are now touted by several vendors. Compaq engineered PCI Hot Plug technology, which has been adopted as an industry standard.

Compaq also enhances products through its partnerships with leading software companies. Compaq develops and maintains strategic relationships with industry leaders to provide total solutions offering the highest level of service and support.

This document examines the tangible and intangible features that make Compaq servers and workstations the number one choice for customers who demand quality and reliability. This document describes features within the server families and server options supporting them. This document is intended as a reference aid for those who want to understand how Compaq adds value to products.

High Availability Features

Compaq understands that you employ systems to accomplish mission-critical functions. Such functions are central to the success of your operation and any loss of availability translates into a loss of time and money. To protect you from such losses, Compaq offers many features that ensure Compaq servers provide maximum uptime with minimal maintenance.

High availability involves providing three major classes of functionality:

- Features that work around any failures without interruption of service (*Non-Stop Computing*)
- Features designed to reduce the time it takes to recover from failures (*Rapid Recovery*)
- Features designed to prevent problems from occurring (*Fault Prevention*)

Non-Stop Computing Features

Non-stop computing technologies provide a first line of defense against failures. These technologies enable you to route around potential faults and continue operating with little or no interruption of service. In many cases, non-stop computing features incorporate some degree of redundancy. The features listed in Table 1 enable Compaq systems to work around potential failures without requiring immediate intervention.

Table 1: Non-Stop Computing Features

Feature	Description
Advanced Network Control Utility	Merges two similar network controllers into a controller pair allowing failover if a fault occurs
Cluster Verification Utility	Helps determine whether a configuration is suitable for use with Microsoft Cluster Service
On-line Recovery Server	Allows two servers to act as a redundant pair while handling two separate workloads
Online Storage Controller Recovery	Merges matched SMART-2 controllers into controller pairs providing controller redundancy
Redundant Fans	Ensures proper airflow around temperature-sensitive components if a fan fails
Redundant Hot-plug Power Supply	Allows power supplies to be added or replaced without shutting down the server
Redundant Power Modules	Enables Power Safe Modules to act as hot spares if the primary power module fails
Redundant Power Supplies	Ensures that the server continues operating even when a power supply fails
Standby Recovery Server	Allows two servers to act as a redundant pair, one acting as the hot spare for the active server
Storage Automatic Reconstruction	Reconstructs data automatically to an online spare drive or a replacement drive if a drive fails

Rapid Recovery Features

Rapid recovery features offer the ability to recover from server or component failure with the least possible impact on uptime. Several of the features listed in Table 2 enable recovery from component failures without shutting down the server.

Table 2 : Rapid Recovery Features

Feature	Description
Automatic Server Recovery-2 (ASR-2)	Allows the server to reboot, call the administrator, and report critical problems
Fan Detect and Shutdown	Allows the operating system to detect failure of the fan(s) and invoke automatic shutdown
Hot-pluggable Drives	Permits you to plug and unplug SCSI drives from the system while the system is running
Hot-plug Fans	Allows replacement of fans without shutting the system down
Hot-plug Keyboards	Provides the ability to replace keyboards on a server without the need to restart the system
PCI Hot Plug	Allows add, removal, and upgrade of PCI controllers without shutting down the system
Server Failure Notification	Sends a pager alert to notify your system administrator of a server malfunction
Server Recovery Notification	Sends a pager alert to notify your system administrator of recovery from a server malfunction
Temperature Detect and Shutdown	Detects when the temperature of the system exceeds the caution level and invokes shutdown
Windows NT HAL Recovery	Replaces the Windows NT HAL should the HAL become corrupted

Fault Prevention Features

One of the most obvious ways to improve the availability of a server is to include features that enable the system to avoid problems. Such features involve forward-looking technologies that anticipate the likelihood of a situation and prevent the situation from becoming a problem. Table 3 lists features that improve uptime by preventing server failures.

Table 3 : Fault Prevention Features

Feature	Description
ECC Memory	Enables detection and correction of all single-bit memory errors
Intelligent Power Switch	Allows administrative control of power switch function through software-configurable switches
Memory Deallocation	Tests all memory and automatically deallocates any bad memory blocks that it finds
Power Safety Interlock	Turns system power off automatically when the case cover is removed
Pre-Failure Warranty	Identifies potential problems and provides replacement for critical components before they fail

Life-Cycle Cost Reduction

The most significant portion of the costs for owning a system normally comes from maintaining and expanding systems. Many of the features Compaq incorporates into server products extend their useful life and reduce the maintenance effort and cost. Features that reduce life cycle costs include the following:

- Server Maintenance
- Remote Capabilities
- Investment Protection

In this section, we examine the features that fall into these categories and show how they protect your investments in hardware, software, and especially in the time and efforts of the people who use, manage, and service the systems.

Server Maintenance

Server maintenance involves tracking system parameters, maintaining various subsystems, expanding capacity as needed, and monitoring status of the systems. Table 4 lists features that enable many of the functions of server maintenance to be carried out while the system continues to operate.

Table 4 : Online Server Maintenance Features

Feature	Description
Asset Tag Number	Allows storage of company-specific asset numbers in a firmware repository for easy tracking
Board Release Levers	Provides quick access to modular, removable components that slide out easily
Corrected Error Log	Allows quick determination of the type and frequency of corrected errors
Integrated Management Display	Provides a view of information in the Integrated Management Log and other user-defined text
Power Line Monitoring	Tracks fluctuations in external power line connections
RAID Online Expansion	Allows adding a new disk to a RAID array without destroying the data held in the array
Survey Parameter Capture	Captures system parameters, compares with previous captures, and delivers a comprehensive view of the server and any differences between captures
System Partition Administration Utility	Accesses and updates the System Partition online
System Serial Number	Contains the system serial number in an EEPROM burned at the factory when the system is built
Temperature Monitor via I ₂ C	Utilizes the Intelligent Interface Control to pass temperature information
Voltage/Current Monitor	Tracks voltage and amperage fluctuations through the power supplies

Some server-maintenance features function during the power-up or shutting down of the system. Table 5 lists these off-line server maintenance features.

Table 5 : Off-Line Server Maintenance Features

Feature	Description
Boot Block ROM	Allows the system to boot over the network
CD-ROM Boot	Provides the option of booting from the CD-ROM
Compaq SmartStart for Servers	Simplifies configuration and installation of Compaq servers and options
Configurable Boot Order	Determines which mass storage controller services the boot device
Critical Error Logging	Records catastrophic errors
DOS CPR	Installs MS-DOS on a FAT partition with Microsoft Windows NT already installed
Drive Firmware Upgrade	Provides the ability to upgrade drive firmware with software available over the Internet
Failure/Status LED	Indicates device status and provides alerts of any device failure
Fibre Fault Isolation Utility	Verifies installation and operation of Fibre Channel Storage System
Flashable ROM	Used to apply software updates from the integration server to the production servers
Integrated Management Log	Provides a log of system events including Power-On Self Test (POST) results
Power Down Manager	Gives the administrator an advanced level of flexibility in configuring the behavior of I ₂ C power switches
PCI Plug and Play	Supports the Plug and Play standard for PCI devices
Power-On Error Log	Records errors that occur during Power-On Self Test (POST)
Revision History Table	Stores board revision information in non-volatile memory
System Partition	Contains diagnostic tools and utilities including the System Configuration Utility

Remote Capabilities

Remote capability functions allow control of the server via network or modem on a server without actually being at the server. Table 6 lists these features as well as those that communicate with your system administrator via pager to announce problems or changes.

Table 6 : Remote Capability Features

Feature	Description
Compaq Insight Manager	Delivers fault, performance, and configuration management for servers and desktop clients
Graphical Remote	Enables a graphical view of the Windows NT console to be displayed on the remote console
Info Messenger	Notifies via e-mail the availability of new information or software pertinent to your system
Insight Manager Alerts	Sends alerts to designated pager numbers in case of an impending problem with a server
Integrated Remote Console (IRC)	Allows out-of-band management capabilities such as remote console and remote reset
Power Supply Viewer	Views information about I ₂ C power subsystems remotely
Remote Alpha/Numeric Paging	Sends alpha/numeric pager alert text via Remote Insight/Insight Manager when it detects problems
Remote Asset Management	Allows collection or setting of asset management information remotely by way of Insight Manager
Remote Diagnostics	Analyzes the condition of the server remotely using Insight Manager
Remote Insight	Offers the most complete, out-of-band server management solution
Remote Windows NT SSD Upgrades	Enables your system administrators to apply Windows NT SSD upgrades to systems over the network
Remote Threshold Settings	Sets alert threshold parameters remotely
SmartStart Integration Management	Allows manual upgrade or installation of Compaq products via Integration Server or CD
Software Upgrades via Internet	Software updates are available for many operating systems via easy to navigate web pages

Investment Protection

Compaq protects your investment in several ways. Compaq systems provide features that enable the systems to grow as the demands on the equipment grow.

Compaq offers continued feature updates for legacy versions of popular operating systems. This offers customers who cannot upgrade to current versions of the operating systems to take advantage of many of the latest advances in Compaq technology. The commitment to providing ongoing support of legacy operating environments gives you the ability to decide when to upgrade—based upon your own business requirements. Table 7 describes some of the other features Compaq includes to protect your investment.

Table 7 : Investment Protection Features

Feature	Description
Industry-Standard Components	Ensures that standard components, such as, memory and disks are interchangeable between platforms
New OS Support for Older Servers	Supports older server platforms with new operating system support software releases
Pre-Failure Warranty	Protects your investment by replacing components prior to complete component failure

Performance Tracking and Optimization

Performance analysis features provide information needed to evaluate system performance metrics and allow for tuning and optimization of Compaq systems. Table 8 lists those features.

Table 8 : Performance Tracking and Optimization Features

Feature	Description
EISA Bus Utilization Monitor	Tracks and graphs utilization of the EISA bus
Memory Fault Recovery Tracking	Tracks operations of the memory subsystem for uncorrectable errors
NIC Fault Recovery Tracking	Tracks over twenty failure indications of Ethernet and Token Ring network interfaces
PCI Bus Utilization Monitor	Tracks and graphs utilization of the PCI bus
Server Parameter Tracking	Provides timely fault, performance, and configuration information about critical server subsystems
Storage Fault Recovery Tracking	Tracks failure parameters of mass storage controllers and attached hot-pluggable drives

Security

Compaq servers offer many features that enhance physical and logical security. Table 9 lists security features, broadly defined as features that provide controls over physical access, remote access over the network or modem, and access by other software methods.

Table 9 : Security Features

Security Feature	Description
Administrative Password	Prevents changes to the configuration unless you enter the password
CD Lock	Disables access to the CD-ROM drive
Configuration (NVRAM) Lock	Prevents non-volatile memory modifications and disallows configuration changes
Diskette Drive Control	Enables and disables the diskette drive. No read, write, or boot functions are available
Diskette Write Control	Enables and disables diskette-write functions. Boot and read functions are still available
Front Bezel Key Lock	Locks the front portion of the server protecting the removable media components
Keyboard Password	Locks out the keyboard to prevent unauthorized access to Compaq servers
Network Server Mode	Allows system startup from hard disk or network server while the keyboard and mouse are disabled
Power Down Lock	Disables the power switch to prevent accidental shutdown
Power On Password	Prevents use of the computer unless you enter the password
Protected Power Switch	Prevents accidental server shutdown due to incidental contact with the power switch
QuickLock	Disables the keyboard and pointing device without exiting the application
Serial Parallel Interface Control	Prevents unauthorized transfer of data through the integrated serial and parallel ports

Server Families

Compaq develops servers for small, medium, and enterprise businesses. To that end, Compaq offers a range of products to meet your server needs. In this section we examine the Compaq server families and outline their hardware configurations and features.

ProLiant Family

The ProLiant family represents the premier family of Compaq servers offering the latest reliability and performance enhancements.

ProLiant 400 (announced January, 1999)

The Compaq ProLiant 400 Server joins the Intel Pentium II Xeon processor with a 100 MHz GTL+ front side bus and an integrated Wide Ultra2 SCSI Controller offering performance suited for a variety of applications in an easily affordable server. With two internal and three external drive bays, six total expansion slots, and optimum upgradability in RAM and internal storage, the Compaq ProLiant 400 provides the flexibility to grow your server as your business demands and protect your IT investment. Features, such as Compaq SmartStart for Servers, Compaq Insight Manager, Remote Wake-On-LAN, Automatic Server Recovery, and a Pre-Failure Warranty, make the experience of managing your server simple. This impressive combination of features, affordability, expandability, and reliability make this an ideal platform for basic file/print, remote access and communications, small database, and firewall applications. The Compaq ProLiant 400 Server comes standard with 64-MB ECC Memory, upgradable to a maximum of 384 MB, an internal mass storage capacity of 27.3 GB, and a high performance 32X Max IDE CD-ROM drive.



ProLiant 800 (*announced January, 1997*)



The Compaq ProLiant 800 Server combines performance-enhancing technologies with an affordable workgroup server. The ProLiant 800 Server provides Pentium II processors, ECC Memory, 100 MHz system bus, and an integrated Dual Channel Wide-Ultra SCSI-3 Controller to meet the performance requirements of the most demanding networks. With four internal and four external drive bays, six total available PCI slots, and dual-processor capability, the ProLiant 800 offers the expandability to grow with your business. In addition, with such features as Compaq Insight Manager, Integrated Remote Console, ASR-2, and a Pre-Failure Warranty, the ProLiant 800 maintains the standard of reliability and manageability unique to Compaq.

The ProLiant 800 delivers exceptional performance with up to two 350-MHz, 400-MHz or 450-MHz Pentium Pro processors with 512-KB second-level (L2) Cache. 64 MB of ECC Memory ships standard and can be expanded to 1 GB using industry-standard DIMMs. SmartStart and the CD-ROM drive, make system configuration and software installation faster, easier, and more reliable.

ProLiant 850R (*Discontinued; announced May, 1997*)



The Compaq ProLiant 850R was the first low-profile server to combine affordability and a unique space saving design tailored exclusively for rack environments. The ProLiant 850R featured up to two 200-MHz Pentium Pro processors and the latest technology in network and disk controllers in a 3U rack-mount form factor. This server was designed for medium-to-large businesses requiring an affordable, space-efficient rack-mount solution for communications, Internet/intranet, gateway, or file and print applications.

The expansion bus offered two PCI slots, one ISA slot, and one shared PCI/ISA slot. The chassis contained five bays, three of which were available for hard drives. The integrated Wide-Ultra SCSI-3 Controller provided data transfer rates up to 40 MB/s, doubling the transfer data rates of the Fast-Wide SCSI-2 Controllers for higher performance. The integrated 10/100 TX UTP controller supplied high-performance connectivity that auto senses both 10 Mb/s and 100 Mb/s for maximum performance and had ports for both UTP and coax cable connections. Integrated Remote Console delivered seamless remote console and fully remote server reboot capabilities with the addition of a modem. The system shipped with 32 MB of EDO Memory, which could be expanded up to 512 MB using industry-standard unbuffered DIMMs.

ProLiant 1000 (*Discontinued; announced September, 1993*)



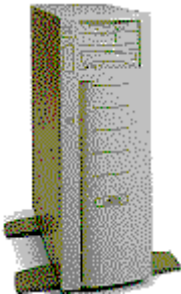
The first member of the ProLiant family, the ProLiant 1000 was built upon the EISA bus architecture and provided eight expansion slots, consisting of seven 8/16/32-bit EISA bus master expansion slots and one management modem slot. The system board provided an integrated Fast-SCSI-2 Controller, as well as integrated SVGA video controller. The system shipped with 16 MB of RAM, expandable to 144 MB (Pentium models) or 128 MB (486 models) using industry-standard SIMMs. The system included a pre-installed NetFlex-2 Ethernet controller and CD-ROM drive. The chassis provided space for eight total internal storage device bays, six of which were internal hot-pluggable drive bays.

ProLiant 1200 (Discontinued; announced November, 1997)

The Compaq ProLiant 1200 used the Intel Pentium II 233-MHz processor with 512 KB Level-2 ECC Cache Memory. Base memory was 32 MB, with eight memory slots allowing expansion up to 512 MB (a limitation of the Pentium II processor). The system architecture was based on dual peer-PCI buses. Integrated Remote Console delivered seamless remote console and full remote server reboot capabilities by adding a modem.

Up to three 1.6-inch hot-plug drives could fit in the case. The integrated Cirrus 54M30 video controller with 1 MB of video RAM provided 1024x768 resolution with 256 colors.

The network interface was the Netelligent 10/100 TX PCI UTP controller, which occupied one of the PCI slots. The ProLiant 1200 provided an integrated Wide-Ultra SCSI-3 Controller that offered data transfer rates up to 40 MB/s. The system was I₂O capable with I₂O Look Aside Connector. The system supported an optional Integrated Management Display.

ProLiant 1500 (Discontinued; announced February, 1995)

FlexSMP System Architecture allowed the ProLiant 1500 to upgrade to dual processing. A 6/200 FlexSMP Dual Processor Board was available to expand to a second 200-MHz Pentium Pro processor. 512 KB secondary write-back cache provided enhanced system performance. 32 MB of ECC Memory was located on the processor board, and was expandable up to 256 MB.

The ProLiant 1500 system board had an integrated 32-bit Fast-Wide SCSI-2 Controller connected to a cage with five hot-pluggable SCSI drive bays. Eight total expansion slots (five EISA, two PCI, and one shared EISA/PCI) were provided, one of which was used by the pre-installed NetFlex-3/P Controller. A quad-speed CD-ROM drive was standard and connected to an integrated EIDE interface on the system board. A redundant power supply upgrade was available.

ProLiant 1600 (announced November, 1997)

The Compaq ProLiant 1600 is the ultimate workgroup server combining high performance and availability features critical to maximizing server uptime. This high-performance server for workgroup and remote-office application comes with uptime features unmatched in its class. A state-of-the-art Pentium II 350-MHz, 400-MHz or 450-MHz processors with 512 KB Second Level ECC Cache, the 100-MHz GTL bus design, and dual-processing capability provide exceptional performance. The integrated Dual Channel Wide-Ultra SCSI-3 Controller offers 80 MB/s aggregate performance with plenty of headroom for growing network demands.

The system comes standard with 64 MB of EDO ECC Memory, expandable to 1 GB using 100-MHz registered SDRAM DIMMs. The system supports up to five one-inch hot-plug hard drives, providing 63.7GB of internal storage capacity. The ProLiant 1600 incorporates Highly Parallel System Architecture, providing improved system bandwidth. It comes standard with an I₂O Connector and Integrated Remote Console. A pre-installed 24X MAX IDE CD-ROM ships with the standard configuration. The system can be ordered with an optional Integrated Management Display.

The system is equipped with a hot-pluggable power supply and can be ordered with an optional redundant hot-plug power supply to enhance system availability. The ProLiant 1600 is protected by a three-year on-site limited warranty and the Compaq Pre-Failure Warranty.

ProLiant 1850R (announced August, 1998)



The Compaq 1850R is a space saving, 3U, high performance, full-featured rack server designed to meet the needs of ISPs, corporate data centers, and remote sites. The 450-MHz Pentium II processor incorporated into this design offers you state-of-the-art performance in a rack-optimized server.

Features include dual-processor capability, 100-MHz GTL bus architecture, 100-MHz, registered ECC SDRAM DIMM Memory, and an integrated Dual Channel Wide-Ultra SCSI-3 Controller. The standard system comes with seven total drive bays, four full-length slots, and accessibility to major components without tools or removing the system from the rack. Moreover, Compaq manageability makes it an unbeatable platform for file/print, e-mail, or small database applications.

ProLiant 2000 (Discontinued; announced September, 1993)



The ProLiant 2000 offered the option of running from one to four processors, using the FlexSMP System Architecture. The system board provided eight EISA bus master expansion slots, one of which was used by the pre-installed NetFlex-2 Ethernet or Token Ring controller. The system board sported an integrated Fast-SCSI-2 Controller in addition to an EIDE controller that serviced the standard CD-ROM drive. The base system included 32 MB of Advanced ECC RAM standard and was expandable to 512 MB using industry-standard SIMMs.

The chassis had eight total internal storage device bays, five of which were hot-pluggable drive bays. An optional redundant power supply was also available for the system.

ProLiant 2500 (Discontinued; announced October, 1996)



The ProLiant 2500 provided full support for dual processing, using up to two Pentium Pro processors for high performance in departmental and Internet/intranet applications. The system board was equipped with an integrated Wide-Ultra SCSI controller, and an integrated high-performance network interface that auto-sensed both 10 Mb/s and 100 Mb/s modes. In addition, the Integrated Remote Console delivered seamless remote console and full remote-server-reboot capabilities with the addition of a modem. The system shipped with 32 MB of ECC Memory and supported up to 1 GB using industry-standard DIMMs.

The chassis provided improved serviceability and flexibility for rack mounting and some models included an Integrated Management Display that delivered fault-tolerant service and configuration information on an easy-to-use LCD panel.

SmartStart and an 8X CD-ROM drive were standard making configuration and software installation faster, easier, and more reliable. In addition, the system came standard with Compaq Insight Manager, Automatic Server Recovery-2, and the Compaq Pre-Failure Warranty to improve system availability. Some of the other server management features of the ProLiant 2500 included Server Health Logging, Revision History Table, Off-Line Backup Processor, and the Compaq Remote Insight Board (optional).

MultiLock security features included power-on password, keyboard password, diskette drive control, diskette boot control, Network Server Mode, security provision, parallel and serial interface control, administrator's password, and disk configuration lock.

ProLiant 3000 (announced November, 1997)



The Compaq ProLiant 3000 delivers performance and expandability levels that you will not outgrow. This high performance server uses its processor and system architecture technology to deliver best-in-class performance while providing increased expansion capabilities to meet the ever-increasing requirements of high-volume file services or entry-level applications. Additionally, the Compaq ProLiant 3000 includes advanced fault-tolerant capabilities and rapid recovery features providing maximum uptime and reliable server operation while lowering TCO.

ProLiant 3000 systems ship in tower or rack-mount (3000R) form factors and feature up to two Pentium II 400-MHz or 450-MHz CPUs with 512-KB Level-2 Cache. It uses the Highly Parallel System Architecture that includes dual-memory controller and dual peer-PCI buses. The Dual Channel Wide-Ultra SCSI-3 Controller provides support for up to six 1.6-inch or eight 1.0-inch hot-plug SCSI drives, offering an internal storage capacity of 109.2 GB.

This system provides a hot-pluggable 750-watt power supply with optional redundant power supply. Eight expansion slots come standard, five PCI and three shared PCI/EISA. The system comes equipped with a standard 24X MAX IDE CD-ROM drive.

The system also includes an integrated Cirrus 54M30 video controller. The Netelligent 10/100 TX PCI UTP Network Interface Controller comes standard and uses a PCI slot. The system can be equipped with optional redundant fans. Other standard features of the ProLiant 3000 include the Integrated Remote Console and Integrated Management Display. In addition, the system offers support for network controller pairing and SMART-2 Array Controller pairing providing a very high degree of fault tolerance for mission critical applications.

The system ships with 128-MB memory standard, expandable to 4 GB using 100 MHz SDRAM. The ProLiant 3000 is I₂O capable and comes equipped with an I₂O Look Aside Connector. It is protected by a three-year, on-site limited warranty and extended Pre-Failure Warranty that covers Pentium II processors, memory, and disk drives.

ProLiant 4000 (Discontinued; announced September, 1993)



ProLiant 4000 servers offered highly extensible performance by allowing up to four system-processor boards to be installed using the FlexSMP system architecture. The I/O board included an integrated Fast-SCSI-2 Controller and provided eight 8/16/32-bit EISA bus master expansion slots. ProLiant 4000 shipped with a standard 64 MB of Advanced ECC Memory expandable to 512 MB. In addition, the ProLiant 4000 was equipped with a pre-installed NetFlex-2 ENET-TR Controller, a CD-ROM drive, and SmartStart.

ProLiant 4500 (Discontinued; announced February, 1996)



ProLiant 4500 provided up to four processors including support for an offline back-up processor with automatic processor recovery. The I/O board included an integrated Fast-Wide SCSI-2 Controller and offered eight 8/16/32-bit EISA bus master expansion slots. The system shipped with 64 MB (32 MB in Model 1) of Advanced ECC RAM, expandable to 1 GB using industry-standard SIMMs. The system included a pre-installed NetFlex-3 controller and CD-ROM drive. The chassis provided seven storage device bays, four of which were internal hot-pluggable drive bays. Some models were equipped with an optional redundant power supply. A 2-MB Transaction Blaster option was available for those interested in running high-end, multiprocessing applications.

ProLiant 5000 (Discontinued; announced June, 1996)



The award winning ProLiant 5000 systems utilized 166-MHz or 200-MHz Pentium Pro processors with integrated 256-KB or 512-KB Level-2 (L2) Cache. The system had a 4-GB memory with industry-standard DIMMs. The system included ECC Memory Data Bus and Level-2 Cache. An optional Redundant Processor Power Module provided continued availability if one power module failed. Support for optional off-line backup processors allowed near-maximum availability in case of processor failure. Dual peer-PCI buses delivered an aggregate 267 MB/s for improved system throughput.

The ProLiant 5000 was equipped with a Netelligent 10/100 TX PCI UTP Network Interface Controller. You could install an additional redundant Netelligent 10/100 Ethernet NIC for maximum system reliability. The Compaq Pre-Failure Warranty covered the Pentium Pro processor as well as hard drive(s) and memory. Optional SMART-2 Array Controllers provided multiple RAID protection levels.

ProLiant 5500 (announced November, 1997)



The ProLiant 5500 combines next-generation multiprocessing and I/O capabilities to deliver industry-leading performance. From its advanced multi-processing capability and support for Compaq next-generation storage technology down to the Netelligent 10/100 Mb/s Ethernet controller with support for redundant failover NICs, this server delivers best-in-class performance and value. This enterprise-class server is specifically designed to support increased computing power while requiring the least amount of space in the server or data center. The ProLiant 5500 combines all of these features with excellent expansion and legendary fault tolerance and management capabilities to deliver outstanding value, while lowering ownership costs.

The ProLiant 5500 Pentium III Xeon supports up to four 500-MHz Pentium III Xeon processors with 100-MHz front-side bus and full-speed cache. The dual peer-PCI architecture eliminates the need to balance I/O. The system ships with 256 MB of ECC EDO Memory that can be expanded to 4 GB using industry standard DIMMs. The system supplies seven expansion slots, including six PCI and one shared PCI/ISA slot. It is protected by a three-year on-site limited warranty and extended Pre-Failure Warranty that covers processors, memory, and disk drives.

It comes in either tower or rack-mount (5500R) models. The system utilizes Highly Parallel System Architecture for improved system bandwidth and provides dual-memory controllers and dual peer-PCI buses for improved throughput to I/O devices resulting in increased overall system performance. The system comes equipped with an integrated Compaq 64-bit Dual Channel Wide Ultra2 SCSI Controller providing support for up to ten 1.0-inch hot-plug SCSI drives with data transfer rates of up to 40 MB/s on each channel.

The ProLiant 5500 also includes a 750/500-watt hot-plug power supply and an optional redundant power supply. It comes standard with Automatic Server Recovery-2 (ASR-2), the Integrated Management Display LCD panel, and the Integrated Remote Console. In addition, the system offers support for redundant fans, network controller pairing, and Smart Array 3200 Controller pairing providing a high degree of fault tolerance for mission-critical applications.

The ProLiant 5500 has an integrated Cirrus 54M30 video controller. A Compaq 10/100 TX PCI Intel UTP Network Interface Controller ships standard with the ProLiant 5500 and occupies a PCI slot. The ProLiant 5500 is I₂O capable with an I₂O Look-Aside Connector standard.

ProLiant 6000 (announced May, 1997)

The ProLiant 6000 delivers breakthrough enterprise performance and the highest levels of expansion for the best value in business-critical environments. The ProLiant 6000 offers up to four 500 MHz Pentium III Xeon processors providing industry-leading performance for CPU-intensive applications such as Terminal Server and database applications. Older models could be configured with up to four 400-MHz Pentium II Xeon processors. The ProLiant 6000 provides leadership performance and unparalleled expansion in an easy-to-service, industry-standard platform.

The system comes standard with 256 MB of ECC EDO DIMM Memory, expandable to 8 GB. One or two redundant power supplies are standard, depending on the model.

The new Pentium III Xeon system has ten expansion slots, including nine PCI slots and one ISA modem slot. All expansion slots use board release levers for quick access to modular, removable components.

The system board provides an integrated Dual Channel Wide-Ultra SCSI-3 Controller with two SCSI channels that transfer data at rates up to 40 MB/s per channel, doubling the data transfer rates of Fast-Wide SCSI-2. The Smart Array 3100 ES Controller can be ordered as an option. The NC3131 Fast Ethernet NIC 64 PCI DualPort 10/00 comes standard, providing a high degree of network reliability. The integrated PCI-based video controller (Cirrus 5430) has 512 KB of video RAM, expandable to 1 MB.

The server includes Integrated Management Display and Integrated Remote Console making the server easy to manage and service. ProLiant 6000 supports SmartStart, Compaq Insight Manager, redundant NIC failover, and Automatic Server Recovery-2 (ASR-2). The system is covered by a three-year on-site limited warranty. The Compaq Pre-Failure Warranty supports Pentium II and Pentium III Xeon processors, memory, and disk drives. The system offers easy conversion to 19-inch rack mount, using 14U per server and allowing three to be installed in a 42U rack, which maximizes configuration flexibility. An optional hot-plug redundant power supply ships on base models, offering N+1 redundancy support for maximum load configuration. The system supports up to six 1-inch drives or four 1.6-inch drives on each backplane, with a maximum of three SCSI backplanes. Duplexing can be accomplished by adding a second SCSI backplane.

Replicated installation from SmartStart and the standard CD-ROM drive deliver quicker and easier enterprise rollouts. It includes Compaq Insight Manager support as well as supporting enhanced event logs with 32 KB of NVRAM.

ProLiant 6400R (announced March, 1999)

The ProLiant 6400R merges an innovative new form factor with the latest technology to create the ideal combination of 4-way computing power and density for space constrained data center environments. The ProLiant 6400R is the perfect platform for data center customers using external storage and backup solutions and wanting the maximum 4-way system performance to run

demanding business applications, implement clustering solutions, or run active intranet, Internet and e-commerce sites. With the latest performance, reliability, manageability, and serviceability features in a space saving 4U (7") design this server provides an ideal solution for the space constrained data center customer.

The ProLiant 6400R supports one to four Intel Pentium III processors with 512-KB, 1-MB, or 2-MB L2 Cache, ECC EDO DIMM Memory expandable to 4 GB, and six 64-bit slots (five PCI Hot Plug and one shared PCI/ISA).

The system ships with industry standard push button PCI Hot Plug, hot-plug drives, redundant hot-plug fans, ASR-2, Online Recovery Server Option, and Integrated Remote Console. Other standard features include an Integrated Dual Channel Wide-Ultra SCSI-3 Storage Controller, a 24X Max IDE CD-ROM Drive (slim line), the Compaq three-year limited warranty, and the Compaq Pre-Failure Warranty coverage of hard drives, memory, and processors. Available options include redundant hot-plug power supplies, redundant power processor modules, and redundant NICs.

ProLiant 6500 (announced August, 1997)



Compaq delivers the most trusted standards-based server for 7x24 multi-server environments with breakthrough performance. Featuring the Pentium III Xeon processor, the ProLiant 6500 offers superior performance and high-availability features to keep your business running 24 hours a day, 7 days a week. You can trust your most critical database, OLTP, messaging, and web hosting needs to the latest in high-availability technology including PCI Hot Plug. The ProLiant 6500 also meets the needs for flexibility and space efficiency desired in modular rack environments. The ProLiant 6500 slim 7U profile makes it ideal for multi-server and external storage implementations, such as clusters or server farms. And with leading server management capability, legendary Compaq quality, and comprehensive service, Compaq and the ProLiant 6500 provide you with superior TCO.

ProLiant 6500 systems can be configured with up to four Pentium III Xeon or Pentium II Xeon processors, providing the performance necessary for the most demanding applications. The system comes standard with 256 MB of EDO Buffered DIMM Memory technology expandable to 4 GB. ProLiant 6500 set new standards for system availability by introducing the first industry-standard PCI Hot Plug bus. The chassis offers five 64-bit PCI Hot Plug slots and one shared 64-bit PCI/EISA (non hot-plug) slot. It comes with modular drive bays (five 1.6-inch or seven 1-inch hot-plug drive bays) for a total storage capacity of 127.4 GB, one 3.5-inch floppy, one CD-ROM, two half-height devices, an integrated parallel port, two serial ports, a mouse, and a keyboard.

The system contains two 750-watt redundant hot-plug power supplies. ProLiant 6500 also offers enhanced system management features (Integrated Remote Console, Integrated Management Display LCD, Enhanced Event logs). The system includes a single integrated Dual Channel Wide Ultra SCSI-3 Controller, providing a data transfer rate up to 40 MB/s on each of the two channels. It is protected by CompaqCare, including a limited three-year parts, labor, and on-site warranty with optional 4-hour response. Pre-Failure Warranty and Compaq Service and Support Programs are available on a worldwide basis.

ProLiant 7000 (announced August, 1997)



The ProLiant 7000 is the ultimate standards-based server, delivering the most scalable performance and highest levels of availability and expansion for 7x24 environments. The ProLiant 7000 offers up to four 500-MHz Pentium III Xeon or 450-MHz Pentium II Xeon processors with support for future Pentium III Xeon processor technology and planned upgrades to eight processors. Combined with the latest high-availability features, including PCI Hot Plug, the ProLiant 7000 offers superior investment protection for your most demanding business-critical applications.

The system comes equipped with 256 MB of ECC EDO DIMM Memory standard, expandable to 8 GB. A Smart Array 3100ES Controller provides three channel RAID support for all of the internal hot-plug drive cages, offering up to 327.6-GB internal storage on the Pentium III Xeon model. The ProLiant 7000 provides five 64-bit PCI slots, four 32-bit PCI slots and one ISA modem slot. All slots use board release levers for quick access to modular, removable components. Pre-installed internal cabling provides improved reliability and manageability. The system includes a dual-port, auto-sensing 10/100-network interface, which supports redundant NIC failover in PCI Hot Plug slots. The ProLiant 7000 comes standard with Integrated Remote Console and Integrated Management Display. The system includes a three-year on-site limited warranty as well as the Compaq Pre-Failure warranty, extended to support Pentium III Xeon and Pentium II Xeon processors.

Prosignia Family

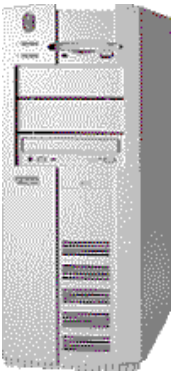
The Prosignia system architecture built upon the success of the Systempro family, while providing more compact packaging. For an even more cost-effective Standby Recovery solution, Compaq now allows a ProSignia server to act as the idle server for a ProLiant server in the standby or online mode.

ProSignia (Discontinued)



The original ProSignia utilized the EISA-bus architecture with several integrated components that left the expansion slots available to fulfill customer requirements. The system supported up to eight mass storage devices internally allowing a full complement of SCSI disks to be attached to the integrated Fast-Wide SCSI Controller. ProSignia came standard with an IDE CD-ROM attached to the integrated EIDE bus, plus the SmartStart CD-ROM package to assist you in getting the system up and running. The ProSignia was the first Compaq server to offer Compaq Insight Manager standard.

ProSignia 200 (announced January, 1997)



The Compaq ProSignia 200 delivers high performance and true server functionality at a desktop price. This server, simple to buy and easy to own, is designed for small and medium-sized businesses requiring an inexpensive, feature-rich workgroup server. Compaq advantages include quick, easy, and reliable server set-up with SmartStart, Wide-Ultra SCSI support, and 512-KB Cache for enhanced file and print performance in server environments.

The ProSignia 200 offers powerful uniprocessor performance in an aggressively priced package. The system uses the PCI System Architecture, which maximizes server performance of PCI systems. The system board offers integrated 32-bit Enhanced IDE, upgradable to Wide-Ultra SCSI-2 (standard on M1 SCSI). It comes standard with 16 MB EDO Memory and supports up to 128 MB using industry-standard SIMMs (upgradable to ECC).

The ProSignia 200 offers an integrated Netelligent 10/100 PCI UTP/Coax Controller, which delivers reliable, high-performance network throughput. The system includes Automatic Server Recovery-2 and Compaq Insight Manager. In addition, SmartStart and the standard 8X CD-ROM drive make configuration and software installation faster, easier, and more reliable.

The ProSignia 200 Small Business (SBS) models come equipped with Intel Pentium II processors operating at 233 MHz, 266 MHz, and 300 MHz with 512-KB second-level (L2) Cache. The system board offers three PCI expansion slots—one populated with video, one shared PCI/ISA slot, and one ISA slot. A 32-bit Wide-Ultra SCSI-3 Controller is available pre-installed in a PCI slot, providing data transfer rates up to 40MB/s. A 1024x768 video controller ships standard with 1 MB of video memory, upgradable to 2 MB.

The SBS system ships with 32 MB of 32-bit EDO Memory, expandable to 192 MB using industry-standard EDO SIMMs, or up to 384 MB using the optional Fast Page Mode (FPM) ECC kits from Compaq. ProSignia 200 comes in tower configuration only and includes a 16X-CD-ROM drive. Additionally, these servers include the Microsoft Small Business Server Software Package.

ProSignia 300 (Discontinued; announced February, 1995)



The ProSignia 300 offered an integrated 32-bit Fast-SCSI-2 Controller and an integrated 32-bit Ethernet controller that delivered faster response time when users accessed files from the server. Instead of a computer optimized for running Windows desktop applications, the ProSignia 300 was optimized for running network operating systems like NetWare. Users found true server features, such as Automatic Server Recovery and ECC Memory, that desktop computers lacked and made the ProSignia 300 a more dependable server platform.

The ProSignia 300 supported the Standby Recovery Server and On-line Recovery Server, which added even more fault management to ProSignia 300 servers. With this option, one ProSignia server acted as a standby for another, taking over in the unlikely event of a hardware or software failure. Compaq Insight Manager and SmartStart were standard, increasing the dependability and manageability of the server. SmartStart built a tested and reliable platform for the server while Compaq Insight Manager made the server easy to manage across the network or from remote locations.

A rack-mounting kit was available as an option allowing you to install ProSignia 300 servers in rack enclosures.

ProSignia 500 (Discontinued; announced November, 1994)



The ProSignia 500 provided a robust and expandable platform which was board and chip upgradable offering uniprocessor and dual-processor configurations using the FlexSMP architecture. The system offered 256 KB of shared secondary write-back cache. The system board included an integrated 32-bit NetFlex-L Ethernet controller, integrated 32-bit Fast-SCSI-2 Controller, and integrated 1024x768 video graphics. The ProSignia 500 contained six total expansion slots, including one processor expansion slot, three EISA slots, one shared EISA/PCI, and one PCI slot.

ProSignia 500 came standard with 16 MB of ECC Memory, expandable to 208 MB using industry-standard SIMMs. The chassis provided eight total storage device bays allowing internal storage expandability up to 30.1 GB. The system was equipped with a pre-installed CD-ROM drive.

ProSignia 500 shipped standard with Compaq SmartStart, Compaq Insight Manager, Automatic Server Recovery (ASR), and Server Health Logs.

Prosignia NeoServer (announced March, 1999)

The Prosignia NeoServer is a ready-to-go server that puts your small business on the fastest and most efficient path to networking. Its integrated operating system makes it simple to manage sharing of files and peripherals, backing up data automatically, accessing your server remotely, and accessing e-mail and the Internet.

The Prosignia NeoServer comes standard with a 6.0-GB EIDE hard drive, a 10/100 TX network interface card, an 8-port 10-Mbps hub, a 56K modem, and the Prosignia NeoServer Control Center.

Prosignia Server 720 (announced November, 1998)

This Compaq server for small businesses allows you to increase business efficiency and still meet a demanding budget. Prosignia servers are easy to use and maintain. From purchase to use, the choice is easy. Especially designed to match the computing needs and budgets of growing businesses, these value-priced servers will meet your file, print, database, and communications needs right now and expand with your business needs. The Prosignia Server 720 utilizes Pentium II processors running at speeds of 350 MHz, 400 MHz, and 450 MHz providing the performance and power needed to serve your most demanding applications. The processors include 100MHz Front Side Bus and 512 KB of Level 2 Cache. The system offers six total expansion slots, including three PCI, one ISA, one shared PCI/ISA, and one AGP. Prosignia Server 720 supports Compaq Insight Manager and Automatic Server Recovery-2 (ASR-2).

Prosignia Server 720 ships with 64 MB of SDRAM DIMM upgradable to 384 MB. The server offers an integrated Netelligent 10/100 TX network interface and an integrated Wide Ultra2 SCSI controller that provides a blistering 80 MB/s throughput when used with Ultra2 SCSI drives. The integrated video controller provides 1024x768 resolution with 256 colors. The chassis utilizes service-friendly tool-free design allowing for quick and easy removal of all mass storage devices via the new Compaq Drivelock mechanism. Prosignia Server 720 is protected by a three-year limited warranty.

Prosignia Server 740 (announced November, 1998)

The Prosignia Server 740 allows you to extend server performance to meet business growth. It utilizes a Pentium III processor running at 500 MHz providing the performance and power needed to serve your most demanding applications. The processors are equipped with 100MHz Front-Side Bus and 512 KB of Level 2 Cache. The system offers six total expansion slots, including two PCI and four shared PCI/ISA. Prosignia Server 740 supports Compaq Insight Manager and Automatic Server Recovery-2 (ASR-2).

Prosignia Server 740 ships with 128-MG ECC RAM that can be upgraded to 1 GB. The server offers an integrated Netelligent 10/100 TX network interface and an integrated Wide Ultra2 SCSI controller that provides a blistering 80 MB/s throughput when used with Ultra2 SCSI drives. The integrated video controller provides 1024x768 resolution with 256 colors. The chassis utilizes service-friendly tool-free design, allowing for quick and easy removal of all mass storage devices via the new Compaq Drivelock mechanism. Prosignia Server 740 is protected by a three-year limited warranty.

ProSignia VS (Discontinued; announced March, 1994)



The ProSignia VS was one of the first members of the ProSignia family. The system was designed to utilize the 486 processor to produce a highly serviceable design. The system board offered integrated 32-bit Fast-SCSI-2 Controller and an integrated NetFlex-L Ethernet controller. There were five EISA bus-master slots. The ProSignia VS came standard with 16 MB of RAM, which was expandable to 128 MB using industry-standard SIMMs. The chassis provided room for five mass storage bays.

ProSignia VS was among the first servers to come standard with Automatic Server Recovery (ASR).

Systempro Family

The Systempro family represented the first Compaq server family. Innovative features, such as eight standard internal drive bays and the FlexSMP multiprocessor architecture laid the foundation upon which other Compaq server products were built.

Systempro (Discontinued)

The original Systempro provided the ability to configure server-class systems using Intel processors. Systempro was designed using the FlexSMP architecture enabling dual-processor configurations. The chassis provided space for eleven devices including up to eight disk devices. The system board offered integrated EIDE and SVGA video.

Systempro LT (Discontinued)

Systempro LT provided a lower cost member of the Systempro family in a uniprocessor configuration. The chassis provided the same number of storage device bays and the system board included integrated EIDE and SVGA video.

Systempro XL (Discontinued)

The Systempro XL enhanced the Systempro family by providing improved processor options including 486DX2 and Pentium processors, available in either uniprocessor or dual-processor configurations. This system was the first to use ECC Memory. Built within the Systempro chassis, the XL provided eleven storage device bays, eight of which were available for internal IDE devices. The system board included integrated EIDE, SVGA video, and Fast SCSI-2 Controllers, leaving the EISA expansion slots available for your use.

Features Supported by Option Families

Fibre Channel Storage Systems

Fibre Channel, the next generation in storage technology, combines the reliability and low latency of a serial channel with the flexibility and connectivity of a network. The result is a 100 MB/s storage network that supports simultaneous transfer of many different data protocols including SCSI, IPI, and IP. Compaq is one of the sponsors of the American National Standards Institute committee responsible for developing the Fibre Channel standards. These standards have been adopted as an enabling technology for high-availability storage networks and server clusters by over two-thirds of the storage industry.

With Compaq Fibre Channel Storage Systems, you can build highly scalable and modular storage architectures using Compaq Fibre Channel Host Controllers, Fibre Channel Array, and Fibre Channel Hub 7 Modules. The Fibre Channel Host Controller is the Fibre Channel Arbitrated Loop (FC-AL) host interface enabling users to attach multiple storage devices to a single PCI or EISA host slot. The Fibre Channel array contains the RAID functionality and disk drives. This provides simultaneous scalability of capacity, processing power, and cache. The Fibre Channel Hub 7 Module can connect multiple devices to the FC-AL providing a very high degree of connectivity and simplicity of storage growth.

Fibre Channel Host Controller

The Compaq Fibre Channel Host Controller provides connectivity as a high-speed interface between the server and up to six Fibre Channel Arrays. It installs in either PCI or EISA versions with the Fibre Channel Host Controller/P as a PCI bus master device. The Fibre Channel Host Controller/E is for use in servers equipped with only EISA expansion slots or with a server that has a majority of EISA bus slots. It takes advantage of the EISA architecture by performing 32-bit bus-mastering burst transfers. Both the PCI and EISA versions require installation of a gigabit-interface converter (GBIC) to the I/O port before the multi-mode fiber is connected.

Fibre Channel Arrays

A Fibre Channel Array is an external drive enclosure containing a Fibre Channel Array Controller, disk drive housing, fan assemblies, and a power supply. A single Fibre Channel Array accommodates up to eight 1.6-inch or twelve 1.0-inch Wide-Ultra SCSI-3 drives. As Table 10 shows, an individual Fibre Channel Array can provide a total capacity of 145.6 GB.

Fibre Channel Storage Hub 7

The Compaq Fibre Channel Storage Hub 7 creates a 100-MB/s Fibre Channel Arbitrated Loop (FC-AL) through its internal wiring and logic as a seven port hub. With the use of the Fibre Channel Storage Hub 7, a Fibre Channel Host Controller occupying a single expansion slot can control up to six Fibre Channel Arrays for a total storage capacity of 873.6 GB. Table 10 shows the capacities of various arrays.

Table 10 : Individual Fibre Channel Array Capacities

Maximum Number of Drives	Drive Size (in inches)	Native Capacity per Drive (Gigabytes)	Maximum Total Capacity (Gigabytes)		
			RAID 0	RAID 1	RAID 4 or 5
8	1.6	18.2	145.6	72.8	127.4
8	1.6	9.1	72.8	36.4	63.7
12	1.0	9.1	109.2	54.6	100.1
12	1.0	4.3	51.6	25.8	47.3

Fibre Channel Array Controller

The Fibre Channel Array Controller, an intelligent Fibre-Channel-to-SCSI array controller, integrates into the Fibre Channel Array. The controller, based on the Compaq SMART-2 Array Controller technology, comes with two Wide-Ultra SCSI-3 channels. Each channel can transfer data at 40 MB/s for 80 MB/s combined potential throughput. The Fibre Channel Array Controllers utilize Wide-Ultra SCSI-3 drives, Fast-Wide SCSI-2 drives, or Fast SCSI-2 drives allowing you to configure your storage subsystem using existing drives.

All of the features listed below for the SMART and SMART-2 Array Controllers are also available on Fibre Channel Array Controllers.

SMART and SMART-2 Array Controllers

The SMART (SCSI Managed Array Technology) and SMART-2 Array Controllers are comprehensive PCI or EISA intelligent array controllers that combine configuration flexibility with intelligent storage management to ensure continuous high-performance access to network data.

Smart Array 3100ES

Max storage numbers for Smart 3100 ES are based on the use of 4.3-GB drives for the SMART controller and 18.2- GB drives for the SMART-2 controllers.

The Smart Array 3100ES controller offers 3 Wide Ultra SCSI-3 channels allowing a single controller to support all 3 internal hot-plug hard drive cages in the ProLiant 7000 and ProLiant 6000 models. Since all three drive cages run off the same RAID engine, all 18 internal hot-plug hard drives can be configured as one 218GB array.

Additionally, the Smart Array 3100ES includes a design optimized for the ProLiant 7000 and 6000 that allows the Wide Ultra SCSI-3 hard drive cages to be directly connected to the I/O board itself, without the use of interconnect cables. This enables much easier PCI Hot Plug usage and the elimination of cumbersome loop back cables used on earlier ProLiant 7000 and 6000 servers. Finally, with a robust 64MB of read/write cache, the controller offers higher performance than the SMART-2DH.

Smart Array 3200

The Smart Array 3200 Controller marks the introduction of 80 MB/s Wide Ultra2 SCSI protocol into the Compaq server family. Compaq increases the performance of this array controller by increasing the on-board accelerator cache from 16 MB to 64 MB. When used with Compaq Wide Ultra2 internal hard drives, the Smart Array 3200 Controller attains maximum data transfer rates up to 80 MB/s per channel or 160 MB/s total. The Smart Array 3200 controller is compatible with Compaq PCI servers.

The Smart Array 3200 Controller continues to deliver the data availability and management features required to increase business productivity and lower TCO. The controller supports up to 15 disks per channel enabling higher capacities with future high-density enclosures. The Smart Array 3200 Controller, based on the field proven SMART-2 intelligent architecture, enables truly breakthrough capabilities for managing high performance storage.

Table 11 lists the SMART and SMART-2 Array Controllers and some of their hardware features.

Table 11 : Compaq Array Controller Comparison

Controller Name	Bus	Cache	Max Drives	SCSI Support	Max Storage	RAID levels
SMART	EISA	2 MB Mirrored (4 MB total) write only, battery backed	14	Fast SCSI-2	60 GB	0,1,4,5
SMART-2/E	EISA	4 MB ECC Memory read/write, battery backed	14	Fast-Wide SCSI-2	254 GB	0,1,4,5
SMART-2/P	PCI	4 MB ECC Memory read/write, battery-backed	14	Fast-Wide SCSI-2	254 GB	0,1,4,5
SMART-2DH	PCI	16 MB ECC Memory read/write, battery-backed	14	Wide-Ultra SCSI-3	254 GB	0,1,4,5
SMART-2SL	PCI	6 MB ECC Memory read-only (4 MB accessible)	7	Wide-Ultra SCSI-3	127 GB	0,1,5
Smart Array 3100ES	PCI	64 MB ECC Memory read/write, battery-backed	18	Wide-Ultra SCSI-3	218 GB	0,1,4,5
Smart Array 3200	PCI	64 MB ECC Memory read/write, battery-backed	28	Wide Ultra2	510 GB	0,1,4,5

Array Accelerator Cache

Disable Array Accelerator Cache when implementing Recovery Server Option or Online Storage Controller Recovery Option in order to preserve data integrity during failover events.

Array Accelerator Cache improves performance when writing to the drive array on the SMART family of controllers. The cache accepts data from the server at maximum PCI or EISA bus burst rates while writing to the array(s). The size of the cache varies from 4 MB to 64 MB depending on the specific model of the controller. This cache has parity check bits to ensure integrity and battery backup protects cache on the controller. Fully charged batteries preserve data in the cache for up to 96 hours.

Array Accelerator Tracking

Array Accelerator Tracking monitors the Array Accelerator Cache battery status and memory integrity.

Array Performance Monitor

The Array Performance Monitor watches essential parameters and provides information for proactive system planning.

Automatic Data Recovery (Storage Automatic Reconstruction)

After you replace a failed drive in a RAID 1, RAID 4, or RAID 5 array, Automatic Data Recovery reconstructs the data and places it on the replaced drive. This allows a rapid recovery to fully operational performance without interrupting normal system operations. This feature runs at the hardware level and functions independent of the operating system.

Auto Reliability Monitoring (ARM)

Auto Reliability Monitoring (ARM) scans hard drives for bad sectors in fault-tolerant logic drives as a background process. ARM also verifies the consistency of parity data in drives with Data Guarding (RAID 4) and Distributed Data Guarding (RAID 5). This process assures that you can recover all data successfully if a drive failure occurs in the future. ARM operates only when you select Drive Mirroring, Data Guarding, or Distributed Data Guarding.

Bus Master Transfers to System Memory

The SMART controllers take control of the EISA or PCI bus during high-speed transfers as bus master devices. This allows the system to handle application processing or other types of tasks while data transfers continue to process. The Intelligent Array Engine on the controller buffers the data from the drives before transferring it to system memory. Bus master high-speed transfers are particularly important when the supported models are used in conjunction with multiple expansion boards, such as network interface controllers.

Concurrent I/O Request Servicing

SMART Controllers use Intelligent Array Engines (IAE) to service multiple requests concurrently. The first IAE provides parallel control and data access to multiple drives. High-speed transfers route directly to main system memory to improve overall performance. During this time the second IAE optimizes the order in which instructions execute. For example, if one user requests data that resides on the first drive and another user requests data that resides on the second drive, the controller can deliver both pieces of data concurrently.

Data Striping

Data striping optimizes the storing arrangement of data across multiple physical disk drives organized into a logical drive. Data striping enhances the way the operating system requests data.

Drive Parameter Tracking

Drive Parameter Tracking monitors more than 15 operational parameters and functional tests on the drives. Parameters include read, write, and seek errors, spin-up time, and cable off. Functional tests, such as track-to-track seek time, one-third stroke, and full-stroke seek time are also performed. Drive Parameter Tracking allows you to detect drive problems before they cause the drive to fail.

Drive Roaming

Drive roaming allows groups of drives representing arrays to be moved to other systems without regard to drive sequence installation.

Dual Channel Capabilities

Dual Channel SMART Array Controllers (SMART, SMART-2/E, SMART-2/P, and SMART-2DH) contain two SCSI buses (ports) that support up to seven drives each. The internal and external connectors reside on separate SCSI buses.

Dynamic Sector Repairing

Dynamic Sector Repairing allows the controller to automatically remap any bad sectors it detects either during normal operation or during Auto Reliability Monitoring.

Intelligent Array Engines

Intelligent Array Engines divide processing tasks between two engines; working simultaneously, one engine generates fault tolerance information and manages data flow while the other prepares and sorts array storage commands.

Interim Data Recovery

If one of the drives in a RAID 1, RAID 4, or RAID 5 array fails, the server continues to operate in interim data recovery mode. While operating in this mode, the server continues to process I/O requests, but at a reduced performance level. This feature allows the server to remain functional until the failed drive can be replaced and fault tolerance restored.

Online Capacity Expansion

Online capacity expansion simplifies storage management by allowing online addition of more storage in RAID configurations. This allows your system administrators to extend the capacity of your arrays without the need to back up, reconfigure, and restore during the expansion.

Online Spare Drives

Online spare drives allow SMART controllers to automatically recover from drive failure in RAID 1, RAID 4, and RAID 5 arrays. When one of the drives in an array fails, the controller replaces the failed drive with the online spare and routes all data bound for the failed drive to the spare.

Optimized Request Management

SMART controllers reorganize the I/O request queues to optimize performance.

Performance Tuning Tool (PTT)

The Performance Tuning Tool (PTT) aids the MIS professional to adjust array stripe size and cache memory allocation to optimize and tailor performance for an application.

ProLiant Storage System

The ProLiant Storage System, as a drive-expansion enclosure, offers high storage density, high-availability, and selective fault tolerance. This product is intended for systems running business-critical applications that require high availability, excellent serviceability, and large storage capacity. Table 12 lists the ProLiant Storage Systems and some of their hardware features.

Table 12: ProLiant Storage Systems Compared

Product Name	Max Drives	SCSI Support	Max Storage	Hot-pluggable Components
ProLiant Storage System	7	Fast-Wide SCSI-2	63.7GB	Drives
ProLiant Storage System /F	7 (single bus)	Fast-Wide SCSI-2	127GB (single bus)	Drives
	8 x 1.6" (dual bus)		145GB (dual bus)	Fans
	12 x 1" (dual bus)		72.8GB (dual bus)	Power Supply
ProLiant Storage System /U	7 (single bus)	Wide-Ultra SCSI-3	127GB (single bus)	Drives
	8 x 1.6" (dual bus)		145GB (dual bus)	Fans
	12 x 1" (dual bus)		72.8GB (dual bus)	Redundant Power Supplies

Automatic SCSI Identification

Automatic SCSI Identification sets the SCSI ID on each drive to prevent SCSI ID conflicts.

Internal Duplexing (optional)

Internal Duplexing allows the SCSI bus within a ProLiant Storage System to be divided into two short buses providing the ability to support connections from two mass storage controllers. This improves system reliability if a drive or controller fails.

Keylock

The keylock secures physical access to the disks in a ProLiant Storage System and protects critical data.

Thermal Tracking

Thermal tracking notifies the user when the temperature inside the ProLiant Storage System reaches 50°C. This warning passes to the operating system through the controller. If the user does not act, the 60°C thermal-protection circuitry causes the power supply to shut down automatically.

Appendix A - Glossary

In this section, features and options are listed alphabetically. Detailed feature descriptions are provided in this section.

administrative password

An administrative password prevents changes to the configuration unless you enter the password.

Advanced Network Control Utility

The Advanced Network Control Utility provides the ability to merge two similar network controllers into a controller pair. In such a pair, one controller performs as the active controller and the other remains in standby mode. If the active controller fails, all network traffic switches to the backup controller. In systems that support PCI Hot Plug technology, a failed controller can be replaced and the controller pair restored to complete redundancy without shutting down the system.

Array Configuration Utility

The Array Configuration Utility simplifies array configuration and facilitates online capacity expansion as a graphical user interface. There are two versions of the Array Configuration Utility; one runs from bootable diskettes and the other runs online from the operating system. Each offers the ability to manage the arrays for any of the SMART, SMART-2, and Smart Array controllers.

Asset Tag Number

The Asset Tag Number is used as a repository for storing company-specific asset numbers for easy tracking and is initially set equal to the system serial number. The Asset Tag is stored in a protected section of non-volatile memory, which can be accessed and modified with the System Configuration Utility.

Automatic Server Recovery (ASR)

In case of a critical hardware or software error, Automatic Server Recovery allows the server to reboot to either the operating system or Compaq utilities, call the administrator, or report the problem.

ASR offers a cost-effective means of minimizing unplanned downtime since automatic reboot of the server brings users back on line with minimal interruption of service. ASR consists of three elements:

- Hardware integrated onto the system board that, with the assistance of an operating system driver, detects when a server has malfunctioned and consequently resets the system.
- Server failure notifications that send a pager alert to notify your system administrator of a server malfunction.
- Capability to reboot to the operating system or to Compaq utilities in order to run diagnostics and reconfigure remotely.

Automatic Server Recovery-2 (ASR-2)

ASR-2, a superset of the functionality provided by ASR, adds the environmental recovery features: thermal shutdown and UPS shutdown.

board release levers

Board release levers can be used to secure and release adapters allowing quick access to modular, removable components without the need for tools. When opened, the levers disable power to the associated slot.

boot block ROM

Boot block ROM, a read-only section of the ROM, contains a failsafe code to make sure you can always boot a minimum system—even when the ROM code becomes corrupted. It ensures that you can always boot to a ROMPaq diskette to restore the ROM.

CD lock

The CD lock provides a means of disabling CD-ROM access. This enables the administrator to prohibit the use of the CD-ROM for unauthorized software loading.

CD-ROM boot

Many Compaq servers provide the option of booting from the CD-ROM drive greatly simplifying the process of initial software load by eliminating the need to use floppy diskettes.

Cluster Verification Utility

The Cluster Verification Utility aids your administrator in diagnosing their setup to determine its suitability for use with the Microsoft Cluster Service (MSCS).

Compaq Insight Manager

Compaq Insight Manager presents an intuitive systems management tool delivering fault, performance, and configuration management for Compaq servers and desktop clients. Compaq Insight Management software follows a client-server architecture. The front-end management application, Insight Manager, delivers management capabilities to the user in an intuitive, easy-to-use manner. Meanwhile, the back-end software, Compaq Insight Management Agents (Insight Agents), run on the server providing access to the advanced hardware technologies that make server management possible.

Insight Agents check fault and performance indicators for the server hardware and options, providing the information in the form of a Management Information Block (MIB). Insight Agents also collect asset information and component failure information making these available to administrators even when the server is down or otherwise inaccessible to the network.

Management information passes to Insight Manager through the Simple Network Management Protocol (SNMP), the industry standard for management information communication. This standards-based management scheme also allows SNMP-based management platforms to monitor Compaq Server Management data.

The optional Compaq Remote Insight Board provides an OS-independent remote connection to a managed server, allowing a remote PC to display all phases of server activity (including POST sequences and OS load) without loss of connection. In addition, the administrator can use the Remote Insight Board to perform remote reboots and to receive alphanumeric or digital pages when a problem occurs.

Compaq PCI Hot Plug Utility

This utility configures PCI Hot Plug which allow new PCI devices to be added, unused PCI devices to be removed, or PCI devices to be replaced.

configurable boot order

Compaq servers provide the option of setting a System Configuration Parameter to determine which mass storage controller services the boot device. The Controller Order Parameter, available for every mass storage controller installed in a server, can be accessed through the Compaq System Configuration Utility.

configuration (NVRAM) lock

The configuration lock disallows configuration changes when in use by not allowing non-volatile memory to be modified.

Corrected Error Log

The Corrected Error Log contains the date, time, frequency, and unique information about errors that were corrected automatically by various server subsystems. It allows quick determination of the type and frequency of corrected errors. For ProLiant 1500s, this log contains error information about corrected ECC Memory errors, including which SIMM produced the errors. This log can be read through Compaq Insight Manager and Compaq Diagnostics.

critical error logging

Critical error logging records catastrophic errors, such as non-correctable memory, expansion board, and expansion-bus attribution errors. After a critical error occurs, the system ROM indicates on boot up that a critical error occurred and prompts you to run Compaq Utilities. The critical error log contains the time and date of the error. When a critical error logs, the server can notify you when it reboots. The critical error log allows quick correlation of server errors and their causes.

diskette drive control

The diskette drive control enables and disables the diskette drive(s). No read, write, or boot functions are available when the diskette drive is disabled.

diskette write control

Diskette write control enables and disables diskette-write functions. Boot and read functions are still available when diskette writing is disabled.

DOS CPR Utility

The DOS CPR Utility installs minimal MS-DOS on a FAT-formatted partition with Microsoft Windows NT already installed without disabling the Windows NT boot environment.

Drive Firmware Upgrade

To keep drives operating at peak capabilities, Compaq introduced Drive Firmware Upgrades as a means of allowing your administrators to install the latest firmware revisions on Compaq disk drives.

ECC Memory

Error Checking and Correcting (ECC) Memory enables detection and correction of all single-bit, 2-bit, and 3-bit memory errors and most 4-adjacent-bit memory errors. This ensures that common memory errors can be corrected without interrupting system operation. More severe errors, such as the loss of an entire 4-bit DRAM are detected quickly.

EISA bus utilization monitor

The EISA bus utilization monitor tracks and graphs utilization of the EISA bus.

failure/status LEDs

Most Compaq hardware products include LEDs used to indicate device status and to alert you of any device failure. Some examples of the products that incorporate these LEDs include server systems, storage systems, disk drives, network interface cards, and even PCI Hot Plug slots. In general, a solid green LED indicates normal operation, flashing green indicates a change of status or activity, solid yellow indicates the system requires some attention, and red indicates device failure.

fan detect and shutdown

Fan detect and shutdown, a feature of ASR-2, allows the operating system to detect when the fan(s) of the system fails. In order to prevent a potentially serious degradation of thermally sensitive components, the server might shut down automatically. Accompanying data in the log indicates whether an auto-shutdown sequence was invoked by the operating system.

Fibre Fault Isolation Utility

The Fibre Fault Isolation Utility verifies the installation and operation of a new or existing Fibre Channel Storage System. The utility displays all of the devices properly logged onto the fiber channel arbitrated loop and tests for link errors within that loop.

flashable ROM

Flashable ROMs, included in all of the newer Compaq servers, allow you to download and install the latest versions of firmware (ROMPaqs) at no cost. This ensures that you have access to the latest enhancements without the need for service calls.

front bezel key lock

This external key lock protects the removable media components of the server and provides an additional layer of security for the internal components, such as the memory and CPU(s).

graphical remote

Graphical remote enables a graphical view of the Windows NT console to be displayed on a remote console when accessing the Remote Insight Board in a Windows NT server. This feature requires the use of graphical remote console software such as Carbon Copy or pcAnywhere32.

hot-plug fans

Hot-plug fans offer you the ability to replace a fan without shutting down the system.

hot-pluggable drives

Many Compaq servers are equipped with hot-pluggable SCSI drive cages, which permit you to insert and remove SCSI drives from the system while the system continues to operate. This allows you to replace failed drives in RAID disk arrays without shutting down the server.

hot-plug keyboard

Hot-plug keyboards provide the ability to add or replace a keyboard without the need to reboot.

Info Messenger

Compaq Info Messenger, a proactive Compaq Internet service, provides you with the latest information relevant to your specific computing environments. Compaq Info Messenger searches the Compaq website, collects the information you want, and alerts you via e-mail that it is available on a customized web page on Compaq Access. You can access Compaq Info Messenger at www.compaq.com/infomessenger.

Insight Asynchronous Management

Insight Asynchronous Management provides access to Insight Manager using an out-of-band connection through Point-to-Point Protocol (PPP). This gives remote access to all the alerting data and data collection of Insight Manager as long as the OS functions.

Insight Manager auto alerts

With Compaq Insight Manager, you can designate who will be *on call* for any Compaq server or subsystem performance issue. If Insight Manager detects an unacceptable operating parameter, it sends out pager alerts to those you specify whom, in turn, access the analysis capability of Compaq Insight Manager to obtain a diagnosis and recommendation. Your system administrators can respond to and resolve your server issue, even before you know it exists. Compaq Insight Manager, version 2.0 and later, includes this feature.

Integrated Management Display (IMD)

Integrated Management Display (IMD) provides information about events stored in the Integrated Management Log that occur during Power-On Self Test (POST), as well as system events during normal operation. In addition to event-specific information, the system can be configured to display administrative contact information, as well as system name and address, which can be entered through the Integrated Management Display Utility.

Integrated Management Display Utility

This utility configures the Integrated Management Display to display events and information needed by your system administrator.

Integrated Management Log (IML)

The Integrated Management Log (IML) replaces the Critical Error Log and Correctable Memory Log, recording system events and storing them in an easily viewable form. The IML marks each event with a time-stamp and categorizes events as one of four levels:

- Status (informational only)
- Repaired (corrective action taken)
- Caution (non-fatal error condition)
- Critical (component failure).

Integrated Management Log Viewer (IMLV)

The Integrated Management Log Viewer (IMLV) allows you to view the IML of any machine running the Compaq Remote Monitor Service.

Integrated Remote Console (IRC)

Compaq developed Integrated Remote Console (IRC) to allow out-of-band management capabilities—remote console and remote reset—independent of the state of the network operating system. With the IRC function, an administrator has the ability to access the server, perform diagnostics, reset the system, watch the reset process remotely, and view ASR reset sequences—regardless of whether the server OS is online or offline.

IRC complements Insight Asynchronous Management by providing an easy-to-use remote-console feature while the OS runs. IRC interfaces with Insight Asynchronous Management so that both capabilities are available to you in an out-of-band, online situation.

IRC gives you the ability to access remote servers, monitor and diagnose problems, and protect data with security features through its combination of hardware and firmware integrated onto the server motherboard. The seamless hardware-based remote console, hardware-based remote reset, and reset-sequence replay features are available to your administrator—whether the servers are in multiple remote locations or grouped in a centralized site, yet still away from your administrator.

However, you may need even more capabilities than those available with the IRC function. Compaq also offers the optional Compaq Remote Insight Board if you require access and alerts at all times, regardless of the state of the server hardware or OS.

Integration Maintenance Utility

The Compaq Integration Maintenance Utility for NetWare allows additions or updates of the latest revisions of software and Compaq utilities on a NetWare server without having to restart the server. The Integration Maintenance Utility eases the administrative task of keeping software on the server consistent across the network. It allows software installs and updates from the integration server on the network or from CDs provided by Compaq.

Intelligent Power Switch

The Intelligent Power Switch provides an advanced level of flexibility in powering down the server. You configure the Intelligent Power Switch using the Compaq Power Down Manager Utility; it can be configured to behave in one of three ways:

- Do nothing when the power switch turns off (Power Down Lock)
- Power down as soon as the power switch turns off
- Shut down the operating system gracefully when the power switch turns off

The utility can also be used to set a delay in seconds between the time the power switch turns off and the time the configured action occurs.

keyboard password

The keyboard password can be used to lock out the keyboard preventing unauthorized access to Compaq servers. This effectively prevents logins or commands until entry of the proper password.

long operating system life support

Long operating system life support provides support for legacy and less recent versions of operating systems. Compaq understands that you cannot always upgrade all of your servers to the latest release of operating systems as soon as they become available. In support of this, Compaq continues to release support software and driver updates for less recent versions of operating systems, such as Windows NT 3.51, NetWare 4.x, or SCO OpenServer 5, long after newer versions are released. This provides you with the assurance that they can take advantage of the most recent advances in the drivers, firmware, and support utilities released by Compaq.

memory deallocation

Memory deallocation keeps a bad memory block from being used again. For unattended recovery, ASR-2 logs the error information to the Critical Error Log, resets the server, tests all memory, and automatically deallocates any bad memory blocks that it finds.

memory fault recovery tracking

Memory fault recovery tracking monitors the operations of the memory subsystem for uncorrectable errors and enables rapid recovery from actual memory failures.

Monitor Utility for Smart Array

Monitor Utility for Smart Array continuously displays the physical drive status for drives connected to one or more Compaq Array controllers. It also provides an audible notification when it detects a drive failure. The audible signal continues until you press a key on the keyboard. This utility works in conjunction with the NetWare Peripheral Architecture (NWPA) driver. The utility detects hot-plugged drives and other changes to array configurations.

network interface fault recovery tracking

Network interface fault recovery tracking monitors over 20 failure indication parameters, such as alignment errors, lost frames, and frame copy errors of Ethernet and Token Ring network interfaces. The information decreases downtime by enabling diagnosis of network interface failures and is available via the Compaq Insight Manager.

Network Server Mode

Network Server Mode permits system startups from hard disk or network server while the keyboard and pointing device are disabled. This provides security if the server operates unattended. In Network Server Mode, the system starts without asking for the Power-On Password. The Power-On Password must be enabled before you can authorize Network Server Mode. The Power-On Password remains in effect until you delete or disable Network Server Mode. If you attempt to boot from a diskette while Network Server Mode is enabled, you must enter the Power-On Password.

NIC Fault Recovery Tracking

This utility tracks over twenty failure possibilities in Ethernet and Token Ring network interfaces.

On-line Recovery Server

On-line Recovery Server, as an implementation of the Recovery Server Option (RSO), pairs two servers and connects them to a pair of independent storage environments. If one of the servers fails, the other server inherits the storage environment and workload of the failed server. For more information on On-line Recovery Server, refer to the white paper entitled *Compaq On-line Recovery Server* (document number ECG027/0598).

Online Configuration Utility for NetWare

The Online Configuration Utility for NetWare allows configuration of SMART-2 and Fibre Channel Array controllers without shutting down the system. You can prioritize, configure, or expand the array as well as monitor and configure redundant NICs with this utility.

Online Storage Controller Recovery Option (OSCRO)

On-line Recovery Server cannot be implemented in conjunction with Online Storage Controller Recovery Option (OSCRO), as both utilize the same type of switched interfaces to the storage environment, and the cable configurations are not compatible.

Compaq Online Storage Controller Recovery Option, as an implementation of Recovery Server Option (RSO), provides mass storage controller redundancy by merging two matched SMART-2 controllers into a controller pair. In such a pair, one controller is active and the other remains in standby mode. Should a problem occur with the active controller, the I/O traffic switches to the standby controller without loss of data or interruption of service. Working in conjunction with RAID technology, OSCRO provides extended fault tolerance for mission critical servers. OSCRO is a natural partner for PCI Hot Plug

technology. Together, OSCRO and PCI Hot Plug offer a means of keeping a server running and maintaining the fault tolerant status of the server without shutting down the server.

PCI bus monitor

The PCI bus monitor tracks and graphs utilization of the PCI bus(es) as part of Compaq Insight Manager.

PCI Hot Plug

PCI Hot Plug defines the standard for high availability in Compaq servers by allowing new PCI controllers to be added, unused PCI controllers to be removed, and old or defective PCI controllers to be replaced without shutting down the system. PCI Hot Plug is an extension of the *PCI Local Bus Specification*. Compaq PCI Hot Plug hardware isolates each hot-plug slot from all other devices on the PCI bus. By offering slot-level control, Compaq provides great flexibility. Slot level isolation eliminates interruption to other components and applications using those components enabling the system to continue performing useful work throughout the hot replacement.

PCI Plug and Play

Many Compaq products now support the Plug and Play standard for PCI devices, which offers a means of identifying a PCI device and the system resources it requires through the use of a ROM on the device.

power down lock

The power down lock disables the power switch to prevent the server from being shut down accidentally. The Intelligent Power Switch includes this functionality.

Power Down Manager

The Power Down Manager allows you to define the behavior of the I₂C power switch of a server locally or remotely. Options include disabling the power switch and imposing a fixed delay between the pressing of the power switch and actual shutdown of the server.

power line monitoring

Power line monitoring provides information about voltage and current levels in Compaq power supplies.

Power-On Password

The Power-On Password prevents use of the computer until you enter the password. (See also Network Server Mode.) During Automatic Server Recovery (ASR), the system does not prompt for the Power-On Password allowing ASR to perform the necessary reboots in an unattended fashion.

Power-On Error Log

The Power-On Error Log records errors that occur during Power-On Self Test (POST). It allows quick determination of the cause of a server failure to reboot. (See also *Rapid Recovery Features*.)

Power Safe Modules

Power Safe Modules (DC to DC converters) ensure delivery of proper voltage to critical operational components including the processors, the I/O boards, and the PCI buses. There are two types of power safe modules: CPU board converters and I/O system board converters.

power safety interlock

All ProLiant servers have a built-in power safety interlock switch that automatically turns system power off when you remove the case cover. In addition to protecting your safety by preventing access to high-energy components, this feature also protects thermally sensitive components by ensuring ideal airflow throughout the server. Although the interlock switch does prevent access to the power supply, CPU, memory, and some expansion slots, it does not prevent access to hot-pluggable devices.

Power Subsystem Utility

The Power Subsystem Utility, a system management driver user interface utility for NetWare, displays the redundant power subsystem status. In addition, the utility incorporates the Compaq Power Down Manager to allow configuration of the Intelligent Power Switch.

power supply viewer

The power supply viewer allows you to locally or remotely view redundancy information of I₂C power subsystems and statistics of individual power supplies.

Pre-Failure Warranty

Compaq Server products using Compaq Insight Manager 2.0 or greater are covered by the Compaq Pre-Failure Warranty. The Pre-Failure Warranty extends the advantage of the Compaq three-year limited warranty by providing coverage on many critical components.

This includes hard drives used in conjunction with SMART Array Controllers and memory as well as Pentium Pro, Pentium II Xeon, and Pentium III Xeon processors before they actually fail. The Pre-Failure Warranty ensures that when you receive notification from your monitoring software that a critical server component might fail, Compaq replaces the component free of charge under the warranty. With the Pre-Failure Warranty, your system administrators can proactively schedule downtime for maintenance and not interrupt critical business operations relying on these servers.

protected power switch

The protected power switch prevents the server from accidental shutdown due to incidental contact with the power switch cover. The oval-shaped switch covers the normal power switch. The whole assembly can be popped out and rotated 180 degrees so that only the inside switch can be operated.

QuickLock

Using the QuickLock hot-key combination, **Ctrl+Alt+L**, disables the keyboard and pointing device without exiting the application. The application remains in view on the monitor screen but you cannot access it. You can change the QuickLock hot key combination if the default combination conflicts with your application software.

RAID Online Expansion

RAID Online Expansion, an integral function of the Array Configuration Utility, provides the ability to increase the size of a RAID array by adding a new disk to the array without destroying the data held in the array.

redundant fans

Redundant fans are extra fans installed in the server to ensure proper airflow around temperature sensitive components in case of a single fan failure.

redundant hot-plug power supply

Newer Compaq servers have the option of being equipped with redundant hot-pluggable power supplies. These servers can accept up to three power supply units. While all units function, the power supplies work together, balancing the load between the active units. If a power supply fails, the remaining unit(s) picks up the load and continues operating. Your system administrator can then replace the failed power supply without shutting down the server or impacting the other power supplies.

redundant power module

A redundant power module operates only when other converters fail. Up to three CPU board converters (Power Safe Modules) can be installed on each CPU board. This allows for two independent CPU board converters to service two independent CPUs, with the third acting as a redundant converter which operates only when one or both of the other two converters fails.

Up to two I/O system board converters (Power Safe Modules) can be installed on the system board. Both converters should be installed at all times to provide redundancy.

redundant power supply

Some Compaq servers are equipped with multiple power supplies to ensure that the server continues operating even when a power supply fails.

remote alert

A remote alert goes out to a designated individual via Insight Manager, ASR-2, or Remote Insight Board if Insight manager detects potential problems with a server.

remote alpha/numeric paging

Remote alpha/numeric paging sends alpha alert text if Insight Manager detects problems with a server. You program the designated pager number through Remote Insight/Insight Manager.

remote asset management

Remote asset management allows collection or setting of asset management information remotely by way of Insight Manager.

remote diagnostics

Remote diagnostics allows analysis of the server remotely using Compaq Insight Manager or Remote Insight Board.

Remote Insight Board

Remote Insight Board offers complete hardware independence from the server, as it is essentially a *computer within a computer*. Because the board has its own processor, memory, and battery backup, it can continue operating should the server have a hardware fault or lose power. The on-board battery backup allows the enhanced alerting features of Remote Insight Board (alphanumeric paging, Insight Manager alerts) to be available at all times, even in the case of power outages.

Remote Insight provides seamless PPP integration so that you can move between Insight Manager/SNMP management and the resident remote-console application without any loss of connection regardless of server condition.

In addition, Remote Insight captures critical information through enhanced video sequence replay, which includes failure sequences as well as reset sequences. These enhanced abilities allow two generations of reset sequence data to be stored and preserved by the on-board battery during power outages.

The optional Remote Insight Board offers the most complete out-of-band server management solution. If a server goes down due to a hardware fault, software fault, or even a power outage, it alerts the administrator who can access Remote Insight to bring the server back up.

remote threshold setting

Remote threshold setting allows your system administrators to remotely set the alert thresholds. These thresholds are used by Insight Manager and ASR-2 to determine when to send alert messages indicating a problem with a server.

remote updates to Compaq Support Software for Microsoft Windows NT (Compaq SSD for Windows NT)

The Compaq SSD for Windows NT, version 2.01 and later, for the Microsoft Windows NT 4.0 Setup Utility features two interfaces with the ability to perform remote driver and utility installations, updates, removals, and configurations across a network. The two types of interfaces and their features follow.

- **Graphical User Interface (GUI)** provides a visual representation of the Compaq SSD for Windows NT software components relative to hardware present in the system. The GUI allows you to install, update, and remove components through either an Express or Custom setup process. You can also perform both local and remote component modifications, however, only one computer at a time can be modified.
- **Command Line Interface (CLI)** allows you to install, remove, and update the Compaq SSD for Windows NT components via the command line. The CLI should be considered for silent and batch installations or updates to software components. The batch ability allows for simultaneous update of software components on several computers. Command line activities report to a log file instead of to the screen.

The Remote Setup feature uses a push implementation in which drivers and utilities are pushed from the local computer to the remote computer. This push implementation allows administrators to configure one or more remote computers connected to a network.

The Compaq SSD for Windows NT Setup v2.01 is no longer constrained to the local machine. The options available for local setup are also available for remote setup.

revision history table

The revision history table stores board revision information in non-volatile memory. It logs the system board revision first, then logs other boards that support the Revision History Table, such as the SMART-2 Array Controller, Fast-Wide SCSI-2 Controller, and NetFlex-2 ENET-TR Controller. When you upgrade your server or add new expansion boards, the revision history table records this information. As you troubleshoot server problems, you can use this information to determine if a change to the server configuration might have caused the problem.

serial parallel interface control

Serial parallel interface control blocks the unauthorized transfer of data through the integrated serial and parallel ports.

server failure notification

Server failure notification, part of the ASR and ASR-2 functionality, sends a pager alert to notify your system administrator of a server malfunction.

server recovery notification

Server recovery notification, part of the ASR-2 functionality, sends a pager alert to notify your system administrator of a server malfunction recovery.

SmartStart Integration Maintenance Utility

With SmartStart 3.0 Compaq introduced a new set of functionality called Integration Maintenance for effective setup and maintenance of Novell intraNetWare (NetWare 4.11), NetWare, and Microsoft Windows NT servers.

With Integration Maintenance, your system administrators set up a server to act as the Integration Server; then it services the production servers. The Compaq Integration Maintenance Utility applies software updates from the Integration Server to the production servers.

SmartStart Integration Management

This tool allows the manual upgrade or installation of Compaq products using the Integration Server or a CD.

SmartStart

Compaq SmartStart for Servers, the configuration and software integration tool from Compaq, aids in the installation of Compaq servers by simplifying the process of loading the operating system and installing any specialized device drivers and support utilities.

software updates via Internet

Compaq offers updates of its software to you at no cost through easily navigated web pages. These updates are available for all of the operating systems Compaq supports. Regular updates of the web pages ensures you always have access to the software and firmware needed to keep your Compaq systems running at peak effectiveness.

Standby Recovery Server

Standby Recovery Server cannot be implemented in conjunction with Online Storage Controller Recovery Option (OSCRO).

Standby Recovery Server, as an implementation of the Recovery Server Option (RSO), pairs two servers and connects them to a single storage environment. One of the servers is active while the other remains in standby mode. If the active server fails, the standby takes the place of the active server. For more information on Standby Recovery Server, refer to the white

paper *Compaq Standby Recovery Server* (ECG026/0598).

Storage Automatic Reconstruction

Storage Automatic Reconstruction automatically reconstructs data to an online spare drive or a replacement drive if a drive failure occurs. To use the reconstruction feature you must have your drive configured for Drive Mirroring (RAID 1) or Distributed Data Guarding (RAID 5). Reconstruction reduces downtime by allowing rapid recovery to full system operation if a drive fails.

Storage Fault Recovery Tracking

Storage Fault Recovery Tracking tracks over twelve failure parameters—timeouts, spin-up, and self-test errors—of the SMART-2 Array Controller, the Fast-Wide SCSI-2 Controller, and their attached hot-pluggable drives. The system uses these parameters to accurately pinpoint failed storage subsystem components to enable rapid recovery from controller or hard drive failures.

Support Software Update Utility

The Support Software Update Utility updates Compaq Support Software for Novell Products (Novell SSD) on a NetWare server as a client/server application. The utility has the ability to gather a list of Compaq drivers loaded on the server, the built-in intelligence to decide if those drivers are current, and the option to update those drivers, locally or remotely.

Survey Parameter Capture

This utility captures system parameters, compares the current capture to previous ones, and delivers a comprehensive view of the server and the differences, if any, of the captures.

Survey Utility

Survey Utility builds upon the service tool known as Inspect. Inspect has long been used to capture comprehensive hardware configuration information. Compaq Survey Utility, however, takes this comprehensive reporting functionality and delivers it in an online format. This online capability means that servers running business-critical applications do not require shut down to collect the critical information required for a service call. Not only can Compaq Survey Utility be run while the server is online, but its initial install can be completed without ever having to restart the server. This makes it truly an online service tool.

Compaq Survey Utility not only captures most of the hardware information gathered today by Inspect, but goes a step further and gathers details about the operating system parameters (including NetWare NLMs loaded, NT Services running, and others). By combining hardware and software configuration captures, Compaq Survey Utility delivers a comprehensive view of the server with the ease and simplicity of a single tool.

Another important benefit of Compaq Survey Utility relates to its ability to identify recent configuration changes. It stores each configuration snapshot in a file on the server and compares the latest file to the baseline configuration at each snapshot interval. It then highlights any significant changes and automatically updates the output file to reflect the latest configuration as well as differences relative to the baseline. Recent configuration changes are often the source of the problems manifesting on the server. The ability to quickly generate comprehensive configuration snapshots and highlight specific changes enables problem resolution time to be significantly reduced.

The information gathered by Compaq Survey Utility can be accessed locally at the host server console. From the console, the administrator can initiate an updated snapshot, view the Survey Utility file online, and generate a new output file based on comparing different saved sessions. The output file can also be printed. In addition to user-initiated snapshots, the Survey Utility tool automatically generates and stores updated snapshots upon server restart as well as at user-specified time intervals. This automatic update mechanism helps to ensure that the latest information and change histories are always recorded and available when needed.

System Partition

The System Partition, a special partition created on Compaq disks by SmartStart, contains diagnostic tools and utilities, including the System Configuration Utility. The System Partition varies in size from 2 MB up to about 36.

System Partition Administration Utility

The System Partition Administration Utility accesses and updates the System Partition.

system serial number

Compaq designed the backplane of the computer with an additional serial EEPROM. When the factory builds the computer, it assigns and burns the serial number into the EEPROM. The system serial number can be obtained during asset queries, both locally and remotely.

System Uptime Monitor (SUM)

The System Uptime Monitor (SUM) tracks the availability statistics of the system.

temp detect and shutdown

The temp detect and shutdown feature of ASR-2 allows the operating system to detect when the temperature of the system exceeds the caution level. Accompanying data in the log notes determines whether the operating system invokes an auto-shutdown sequence.

temperature monitor via I₂C

This temperature monitor utilizes Inter-Integrated Circuit (I₂C) bus technology to report temperature events for critical components.

voltage/current monitoring

The voltage/current monitoring feature tracks voltage and current changes with Compaq power supplies.

UnixWare NonStop Clustering

UnixWare NonStop Clustering enables a group of servers to operate as a single, robust computing resource in a highly scalable clustered operating environment. Its single system image (SSI) capability allows a cluster of servers to appear as one single system, greatly improving manageability by allowing transparent access to all cluster resources. SSI also significantly reduces downtime as applications automatically migrate among nodes, without disruption, when a node failure occurs.

Windows NT HAL recovery

The Compaq SSD for Microsoft Windows NT 4.0 includes—as one of its available features—the ability to retain a redundant copy of the Windows NT Hardware Abstraction Layer (HAL) to be used if the default HAL becomes corrupt. This provides a means of recovering from what would otherwise be a catastrophic corruption problem without the need to re-install the operating system.

Appendix B – Solution Partners

Compaq develops and manages partnerships with leading software companies to provide total solutions for your network needs. Solution partners include vendors of operating systems, applications, systems management, and other solution partners. These partnerships ensure your solutions are engineered, tested, tuned, and optimized on Compaq platforms. Compaq experience, enterprise technology leadership, and strategic industry partnerships provide you with unprecedented choice and confidence in the deployment of your network. For additional information on any of the Compaq partnerships, access <http://compaq.com/partners>.

Operating System Vendor Solution Partners

Compaq cultivates partnerships with leading operating system vendors to assure you that the quality and features of Compaq products fully integrate with the most popular operating systems. Compaq and its operating system partners, Microsoft, Novell, and SCO, focus on joint development, marketing, support, testing, and training.

Compaq and Microsoft Frontline Partnership

The Frontline Partnership formalizes the relationship that has existed for more than a decade between Compaq and Microsoft. This long-standing relationship develops and delivers industry-standard information and offers ownership satisfaction and value. The Compaq and Microsoft Frontline Partnership provides leadership to move the industry forward, teamwork to develop the technology you need, experience to provide continuity and secure solution benefits, and commitment to create and support the information technology you need.

Some of the essential pieces of the Frontline Partnership include the following:

- **Joint Development:** Compaq and Microsoft work closely together in the development of innovative new solutions that deliver record-breaking performance and value. Cooperative engineering efforts have resulted in more than ten shared patents including Plug and Play, Advanced Configuration and Power Interface (ACPI), and Device Bay.
- **Joint Marketing:** Through joint seminars, shows, account briefings, communications, and messaging, the Frontline Partnership marketing programs help communicate the value of this partnership to our you.
- **Joint Support:** By providing joint training, technical tools, information databases, and dedicated personnel, Compaq and Microsoft provide superior customer service and support to you.
- **Joint Testing:** Compaq and Microsoft extensively test solutions to ensure performance and reliability and to provide confidence in your choice of a Compaq and Microsoft solution.
- **Joint Training:** Compaq and Microsoft provide their personnel with sales and technical training to insure the proper level of expertise in communicating the advantages of our joint solutions. This training is provided to groups ranging from corporate technical support teams to field sales and engineering as well as our resellers and solution providers.

Compaq operates 29 Microsoft Authorized Support Centers and is one of only two service providers authorized by Microsoft to support its enterprise customers.

Compaq and Novell Enterprise Computing Partnership

Building on the foundation of introducing the first network operating system, the Compaq and Novell Enterprise Computing Partnership provides one of the most responsive and integrated approaches to technical support in the industry. Over the last decade, we continually refined our escalation methodology and enhanced the reciprocal training of technical support staff. This ensures efficient resolution of compatibility issues, reduces duplication of effort, and speeds issue resolution. The Enterprise Computing Partnership delivers compatibility, reliability, optimized performance, manageability, cross-trained technical support, and smooth deployment of networking solutions. The bottom line—when you need answers fast, Compaq and Novell deliver.

This partnership delivers in the following areas:

- **Joint Development:** Compaq and Novell joint developments include the first high-availability solution, SFTIII; as well as SmartStart Integration for all versions of NetWare, NHA-S, the first full support for PCI Hot Plug, and NDS for the Internet.
- **Joint Marketing:** Compaq and Novell offer solutions in their joint marketing efforts and have since the introduction of the first network operating system in 1989 (Novell NetWare running on a Compaq Systempro server).
- **Joint Support:** More than two-thirds of Compaq Accredited System Engineers are also Certified Novell Engineers providing an exceptionally well-trained support staff to provide solutions to your networking challenges.
- **Joint Testing:** Novell software is developed on and optimized for Compaq servers providing unparalleled compatibility. Additionally, new products for both test comprehensively on the other's equipment/software.
- **Joint Training:** Compaq and Novell staff receive sales, technical, and other training to support each other's products. This insures that corporate technical support teams, engineering, and field personnel understand the solutions provided by both partners.

In 1998, Compaq received the first annual Novell Support Connection Service Excellence Award that recognizes Novell allies making service excellence an integral part of their business. Compaq was the only OEM provider of the 18 recipients. Compaq received this award again in 1999.

Compaq and SCO Partnership

The Compaq and SCO Partnership enables Compaq to work closely with the industry leading Intel-based UNIX developer to ensure that the latest Compaq products and features operate in UNIX environments. Through close cooperation with SCO, Compaq has even released some product enhancements in the UNIX environment before they became available in any other environment. The Compaq and SCO Partnership is committed to providing you with all the benefits of a flexible, easily deployed, enterprise-level UNIX system on industry-standard servers and at price points significantly lower than those of RISC UNIX systems.

The relationship between Compaq and SCO includes several initiatives benefiting you:

- **Joint development:** The partnership focuses on strategic planning and development of integrated solutions with faster time to market; easier implementation and maintenance; enhanced availability, manageability and scalability, and improved price:performance. Compaq and SCO work together on such leading technologies as PCI Hot Plug, UnixWare clustering, and intelligent I/O.

- **Joint marketing:** Compaq and SCO combine worldwide joint marketing funds to deliver joint seminars, trade show participation, and account briefings.
- **Joint support:** Dedicated personnel at Compaq and SCO share technical tools and information to better help you with technical issues. Compaq and SCO support joint solutions through their Technical Support Alliance, Engineering Services Agreement, and Service and Support programs provided by the Compaq worldwide network of service partners.
- **Joint testing:** Compaq and SCO test solutions extensively in a laboratory environment before customer delivery, ensuring that you get highly integrated, fully tuned solutions that meet your business needs.
- **Joint training:** Compaq and SCO provide training of personnel to deliver a full range of expertise to our joint customers.

Compaq supplies the largest number of SCO UNIX systems with a 37 percent share of the worldwide SCO UNIX market. SCO has a 41 percent share of the worldwide UNIX server market and over 80 percent of the UNIX on x86-worldwide-server market.

Application Vendor Partners

Compaq forms partnerships with strategic applications vendors to provide you with a high degree of support and reliability when implementing applications on Compaq products. These partnerships ensure that your ability to optimize systems using Compaq platforms is maximized.

Compaq and Baan Partnership

Compaq partners with Baan Company to deliver an industry-standard Enterprise Resource Planning (ERP) solution for the Microsoft Windows NT server environment. This solution features performance with new levels of integration, affordability, and ease of implementation. Through committed resources and joint engineering efforts, Compaq and Baan have produced a predefined, integrated solution that is tested, optimized, and ready to go—increasing your return and decreasing your costs of ownership substantially.

Compaq combines high availability; record TPC-C benchmark numbers; and tools for intelligent integration, management, and security. Compaq and Baan deliver a tightly integrated BAAN IV solution optimized for the Compaq platform. Some of the highlights of this partnership include the following services:

- Reference platform definition, validation, and certification
- Platform integration engineering, performance testing, and benchmarking
- Platform sizing, configuration, and installation tools
- Proof-of-concept or custom platform testing

The Compaq and Baan partnership is committed to providing you with proven solutions that offer the reliability and affordability needed in today's ever-changing computing environments.

Compaq and Computer Associates Partnership

Compaq and Computer Associates join forces to provide you with a consolidated view of your enterprise network. The Compaq Enterprise Backup Solution, comprised of a consolidated fiber channel-based backup and recovery system, was designed in conjunction with Computer Associates. Compaq and Computer Associates provide robust storage management solutions with manageability, automation, scalability, availability, and performance characteristics that enable you to migrate from proprietary systems to standards-based open systems.

This partnership has delivered the following applications:

- Integrated workstations and servers for enterprise management
- Channel program to support resellers in preconfiguring Unicenter TNG on Compaq servers and workstations
- Integration of Unicenter TNG with Compaq Insight Manager

Jointly targeting the market for application storage management, the partnership delivers storage and storage management solutions that are vertically integrated with databases, applications, web servers, and messaging systems.

Compaq and Lotus Partnership

Through cooperative testing and engineering, Compaq and Lotus provide proven solutions to your Internet and intranet needs. Since 1993, the Compaq and Lotus partnership has offered exceptional compatibility, reliability, and performance with low TCO through fast, easy deployment, integration management, high availability and scalability.

The Compaq and Lotus partnership offers several benefits to you, such as the following:

- Easy implementation and management of Internet and intranet solutions
- Wide range of proven products to meet your unique requirements
- Seamless integration of hardware, operating systems, and application software
- Proven expertise in network design, development, systems integration, training, support, and consulting

The Compaq and Lotus partnership delivers unparalleled performance and reliability as demonstrated in thousands of customer sites around the world.

Compaq and Netscape Partnership

Netscape, a pioneer and market leader in software for the Internet, provides proven solutions for Web hosting, e-mail, and collaborative communications. Together with Compaq, they offer powerful, integrated Internet and intranet solutions. This partnership fully leverages the power and flexibility of industry standards and delivers solutions that easily integrate into existing systems.

This partnership has produced the following solutions:

- Reduced costs through fast, easy deployment, management tools, high availability, minimal downtime, and protection of current investments
- Fast, transparent exchange of information between applications for users due to industry-standard solutions that easily integrate with existing systems and networks
- Seamless integration of hardware, operating systems, and application software through cooperative development and testing in dedicated labs
- Highest-quality service and support to you through expert field personnel

Together, Compaq and Netscape offer the most powerful integrated Internet and intranet solutions for organizations of all sizes.

Compaq and Oracle Partnership

Compaq and Oracle deliver high performance solutions by optimizing Oracle databases for Compaq platforms. Compaq and Oracle have worked together since 1989 and, in 1997, reinforced their commitment by signing a Global Technical Support Agreement. In 1998, Compaq and Oracle released the first system sizing tool, Oracle8 OLTP applications.

Compaq and Oracle work together to bring you

- Low-cost, high-performance, fault-tolerant database and enterprise solutions,
- Flexibility and economy through a truly open system,
- Scalability from the desktop to the data center, and
- Integration and optimization of your configuration.

Support analysts from both companies cross-train on each other's products. This allows you to deploy Compaq and Oracle solutions with the confidence of knowing that these products are jointly supported. The Compaq and Oracle Partnership offers worldwide services, support, and integration capabilities to build a complete solution for you.

Compaq and PeopleSoft Partnership

Compaq and PeopleSoft offer the ideal combination of innovative thinking and enterprise experience to deliver solutions that improve business processes from distribution to finance to human resources. The partnership wants to deliver the highest customer satisfaction and, toward that end, invests time, manpower, and resources to understand your evolving needs. We want to maximize the performance, availability, and reliability of your enterprise solution.

Benefits to you from this partnership include the following:

- Broadest range of PeopleSoft solution platforms and operating systems in the industry
- Reduced risk
- Enhanced reliability
- Innovative support tools

Compaq and PeopleSoft deliver solutions built on a solid foundation of years of enterprise experience and hundreds of successful implementations.

Compaq and SAP Partnership

Compaq and SAP work closely together to offer a tightly integrated, tested, and optimized R/3 platform. Compaq R/3 solutions offer you a low TCO with a high level of service and support. Compaq SAP Competency Centers test, pilot, and optimize R/3 on Windows NT solutions. Compaq was the first company to demonstrate failover capabilities for the SAP R/3 using a preliminary version of the Microsoft Wolfpack clustering extensions. Compaq was also the first company to support failover capability in R/3 and Windows NT environments with Compaq On-line Recovery Server and Standby Recovery Server.

Some of the benefits of this partnership include the following:

- Eleven state-of-the-art Competency Centers around the world
- Global service and support infrastructure
- Demonstrated leadership
- Faster time to solution

Compaq was the first to achieve 5,000 SAP R/3 implementations worldwide. In November 1998, Compaq also received two distinguished SAP awards for excellent customer satisfaction ratings with customers running SAP R/3 on Compaq ProLiant and Compaq AlphaServer systems.

Compaq and Siebel Partnership

Compaq and Siebel Systems, Inc. formed a global partnership to provide integrated enterprise solutions for automating sales, telemarketing, and call-center information systems. The companies participate in joint testing, performance optimization, and technology sharing, as well as coordinating field sales and support activities. This partnership allows you to rapidly and cost-effectively develop and deploy customized sales information systems worldwide, based on Compaq platforms and Siebel Systems software.

The Compaq Siebel International Competency Center in San Mateo, CA

- Conducts performance and benchmark tests,
- Offers you pre-sales system sizing,
- Provides integration and optimization services,
- Delivers post-sale service and support, and
- Tests and integrates systems management software and utilities.

This partnership provides you the opportunity to build powerful, flexible, standards-based solution packages that provide distributed access to business-critical sales information across the largest enterprises. Compaq and Siebel have the resources to deliver tightly integrated, optimized and low TCO sales information systems for global customers.

Compaq and VERITAS Partnership

Compaq and VERITAS join together to provide storage solutions optimized for today's data storage and management requirements. It provides compatibility, ease-of-management and integration advantages not found in other products. You can be assured the Compaq and VERITAS solution dedicates itself to providing the following:

- World-class current and next-generation storage-management hardware and software based on a thorough understanding of enterprise storage requirements
- Well-tested, integrated, and highly reliable storage solutions from the exchange of dedicated resources and joint engineering efforts between the two companies
- Lower TCO resulting from the enhanced manageability, scalability, reliability, and performance integration of Compaq and VERITAS technologies
- Easy deployment and operability of the solution from the development of specific systems management tools and innovative product integration efforts with Microsoft Windows NT and Novell NetWare
- Proficient expertise in storage management software and hardware solutions based on market leadership and knowledge

Compaq and VERITAS are committed to providing the best storage solutions for business-critical environments. Through their Global Storage Management Development Agreement, Compaq and VERITAS develop industry-leading solutions for information availability in accessing, protecting, and managing corporate enterprise wide data for client/server platforms.

Systems Management Partners

Compaq continues to drive up the functionality curve, delivering more management capabilities to customers who downsize operations from proprietary midrange and mainframe environments. The goal of Compaq Systems Management Partnerships is to facilitate the optimum integration and use of Compaq systems event, performance, and configuration information into partners' tools. This information is available from Insight Agents installed on Compaq systems. Compaq has integrated this information into HP OpenView, IBM NetView, Sun NetManager, Microsoft SMS, and Novell ManageWise.

The systems management partnerships focus on meeting your most pressing need— enterprise event management for Compaq systems. Event management provides you proactive notification of problems when they happen or before they happen. Further integration with these partners and additional partner applications will provide a broad range of systems management functionality for Compaq systems in other areas that include performance management, change management, production control, help desk operations, and security.

Compaq and BMC Software Partnership

Compaq teams with BMC Software to transform your technology investments into a meaningful and manageable competitive advantage by increasing system uptime, accelerating diagnosis of application failures, and automating your IT support. The partnership creates a unique synergy of capabilities focused on integrating your IT solutions so that your investments do more while costing less.

The partnership offers extensive worldwide service featuring integration, installation, and outsourcing as well as 24/7 support resources. BMC Software provides the foundation to proactively manage operating systems and Compaq servers delivering heightened availability, performance, and service assurance.

Compaq and J. D. Edwards Partnership

Compaq and J. D. Edwards provide essential components of powerful systems; together they have integrated the best technologies of both, delivering an optimized and fully tested enterprise resource planning solution. Both companies dedicate engineering staff and resources to develop and test steps for every phase of system implementation. The Compaq J. D. Edwards International Competence Center provides direct access to resources for your sizing needs and Compaq *ActiveAnswers* supplies easy access to tools and information on a 24/7 basis.

By combining expertise and resources, Compaq and J. D. Edwards provide proven, optimized enterprise resource planning solutions that deploy easily.

Compaq and NetIQ Partnership

Compaq and NetIQ Corporation address the need for comprehensive management by joining Compaq Intelligent Manageability with AppManager Suite. This pushes performance analysis and monitoring beyond the operating system and applications into the hardware environment. This product provides a complete environment for correlating application and hardware tuning as well as proactive management. These tools reduce the time required to identify and diagnose performance issues and the cause of system alerts.

The Compaq and NetIQ partnership delivers efficient problem location and identification resulting in a positive impact on the availability and performance of your system.

Compaq and Tivoli Partnership

Compaq partners with Tivoli Systems to provide you with a greater level of systems management capabilities. Tivoli links Compaq Insight Agents to TME 10 through its Tivoli/Sentry and Tivoli/Enterprise Console (T/EC) applications. The T/EC, a powerful automation application, provides rules-based event correlation for integrating network, systems, database, and applications management. Tivoli/Sentry manages distributed resources by configuring and monitoring parameters and automatically initiating corrective actions.

A Compaq-oriented sentry monitoring collection has been developed to watch more than forty critical performance and system status parameters on each Compaq server managed. When a performance threshold is exceeded, an alert goes to the T/EC for action. Compaq and Tivoli offer the ability to manage your distributed servers from a central point of automated command and control.

Other Solution Partners

Axent Technologies provides Windows NT-based network security for the Internet, intranet, and work groups. Partnered with Compaq, they deliver solutions such as *ActiveAnswers* for Axent Raptor Firewalls, supplying information and methodology for planning, deploying, and operating Compaq equipment in a comprehensive security architecture.

Compaq and **Banyan** ensure that Compaq servers and peripherals are supported and certified with Banyan VINES operating system products.

Compaq works closely with **Citrix** to provide the most robust and comprehensive thin client/server solution available. The advantages to you are lower costs of application ownership, accelerated application deployment, extended application availability, enhanced security, improved backup and recovery, and more effective user support.

Compaq works with **IBM** to support and certify Compaq servers with the IBM OS/2 Warp Server family of products. Compaq also offers extensive support of Compaq Insight Manager and Insight Agents under OS/2.

Compaq and **Intel** work together on a variety of solutions. Compaq and Corollary, an Intel subsidiary, partnered to develop the ProFusion 8-way chipset architecture. Compaq developed PCI Hot Plug technology and licensed it to Intel making it available on all Intel-based systems. Compaq and Intel collaborated on the VI Architecture specification providing a new class of scalable cluster products. Compaq and Intel also worked together to produce imaging and creativity solutions, DVD encryption, and DOS audio support.

Compaq and **Ordinox Network, Inc.** extend networking product capabilities with NIC product support for high-end enterprise management systems, such as HP OpenView, IBM NetView, and SunNet Manager. The partnership agreement adds Netelligent product support to Ordinox WinManager, an innovative high-end, systems-based network management product family.

Compaq servers are tested and certified on the **Sun** Solaris Intel Platform Edition.

Appendix C - Server Family Supported Features

	Svstembro	Svstembro LT	Svstembro XL	ProSiania	ProSiania 200	ProSiania 300	ProSiania 500	ProSiania NeoServer	ProSiania Server 720	ProSiania Server 740	ProSiania VS
High Availability											
Non-Stop Computing Features											
Advanced Network Control Utility				√	√	√	√				√
Cluster Verification Utility				√	√	√	√				√
Hot Spare CPU			√								
On-line Recovery Server Option					√	√	√		√	√	
Online Storage Controller Recovery Option					√	√	√		√	√	
Redundant Fans											
Redundant Hot-plug Power Supply											
Redundant Power Modules											
Redundant Power Supply											
Standby Recovery Server Option					√	√	√		√	√	
Rapid Recovery Features											
ASR			√	√		√	√	√	√		
ASR-2					√					√	√
Fan Detect and Shutdown					√	√	√			√	
Hot-pluggable Drives											
Hot-plug Fans											
Hot-plug Keyboard											
PCI Hot Plug											
Server Failure Notification			√	√	√	√	√		√	√	√
Server Recovery Notification			√	√	√	√	√			√	√
Temperature Detect and Shutdown					√			√	√	√	
Windows NT HAL Recovery					√	√	√		√	√	√
Fault Prevention Features											
ECC Memory			√		√	√	√	√	√	√	
Power Down Manager											
Memory Deallocation			√	√							
Power Safe Modules											
Power Safety Interlock											
Pre-Failure Warranty					√	√	√		√	√	

Systempro	Systempro LT	Systempro XL	ProSignia	ProSignia 200	ProSignia 300	ProSignia 500	Prosignia NeoServer	Prosignia Server 720	Prosignia Server 740	ProSignia VS
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Life Cycle Cost Reduction										
Online Server Maintenance										
Asset Tag Number			√	√	√	√	√	√	√	√
Board Release Levers										
Correctable Memory Log			√		√	√		√	√	
Online Configuration Utility for NetWare				√	√	√		√	√	√
Power Line Monitoring										
RAID Online Expansion	√	√	√	√	√	√		√	√	√
Survey Parameter Capture	√	√	√	√	√	√				√
System Partition Administration Utility				√	√	√		√	√	√
System Serial Number		√	√	√	√	√	√	√	√	√
Temperature Monitor via I ₂ C										
Voltage/Current Monitoring										
Off-line Server Maintenance										
Boot Block ROM				√	√	√	√	√	√	√
CD-ROM Boot				√	√	√		√	√	√
Configurable Boot Order				√	√	√		√	√	√
Critical Error Logging			√	√	√	√		√	√	√
DOS CPR				√	√	√	√	√	√	√
Drive Firmware Upgrade				√	√	√				√
Failure/Status LEDs								√	√	
Fibre Fault Isolation Utility				√	√	√	√		√	√
Flashable ROM			√	√	√	√	√	√	√	√
Intelligent Power Switch							√			
PCI Plug and Play					√	√		√	√	
Power On Error Log								√	√	
Revision History Table					√	√	√		√	√
SmartStart	√	√	√	√	√	√		√	√	√
System Partition	√	√	√	√	√	√		√	√	√

Systempro	Systempro LT	Systempro XL	ProSignia	ProSignia 200	ProSignia 300	ProSignia 500	Prosignia NeoServer	Prosignia Server 720	Prosignia Server 740	ProSignia VS
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Life Cycle Cost Reduction (continued)										
Remote Capabilities										
Compaq Insight Manager	√	√	√	√	√	√	√	√	√	√
Insight Manager Alerts	√	√	√	√	√	√	√	√	√	√
Info Messenger	√	√	√	√	√	√	√	√	√	√
Integrated Management Display								√	√	
Integrated Management Log										
Integrated Remote Console					√					
Remote Alpha/Numeric Paging			√	√	√	√		√	√	√
Remote Diagnostics	√	√	√	√	√	√	√	√	√	√
Remote Insight				√	√	√		√	√	
Remote Compaq Support Software for Windows NT Upgrade				√	√	√		√	√	
Remote Threshold Setting			√	√	√	√		√	√	√
SmartStart Integration Management Utility				√	√	√		√	√	
Software Updates via Internet	√	√	√	√	√	√	√	√	√	√
Investment Protection										
Long Operating System Life Support	√	√	√	√	√	√	√	√	√	√
Industry Standard Components	√	√	√	√	√	√	√	√	√	√
Ultra Wide SCSI-3				√					√	
Performance Tracking and Information										
EISA Bus Utilization Monitor										
Memory Fault Recovery Tracking					√	√	√		√	√
Monitor Utility for Smart Array				√	√	√	√		√	√
NIC Fault Recovery Tracking					√	√	√		√	√
PCI Bus Monitor										
Storage Fault Recovery Tracking			√	√	√	√	√		√	√

	Systempro	Systempro LT	Systempro XL	ProSiania	ProSiania 200	ProSiania 300	ProSiania 500	ProSiania NeoServer	ProSiania Server 720	ProSiania Server 740	ProSiania VS
Life Cycle Cost Reduction (continued)											
Security											
Administrative Password			√	√	√	√	√	√	√	√	√
CD Lock				√	√	√	√		√	√	√
Configuration (NVRAM) Lock	√	√	√	√	√	√	√	√	√	√	√
Diskette Drive Control	√	√	√	√	√	√	√		√	√	√
Diskette Write Control	√	√	√	√	√	√	√		√	√	√
Front Bezel Keylock											
Keyboard Password				√	√	√	√		√	√	√
Network Server Mode	√	√	√	√	√	√	√	√	√	√	√
Power On Password	√	√	√	√	√	√	√		√	√	√
Power Down Lock											
Protected Power Switch					√						
QuickLock	√	√	√	√	√	√	√		√	√	√
Serial/Parallel Interface Control	√	√	√	√	√	√	√		√	√	√
Operating Systems											
Banyan											
VINES 7.0					√	√	√				
VINES 8.0					√	√	√				
VINES 8.5					√	√	√				
IBM											
OS/2 Warp 4					√						
OS/2 Warp Connect 3					√						
OS/2 Warp Server 4					√						
OS/2 Warp Server Advanced 4					√						
OS/2 Warp Server Advanced 4 SMP					√						
OS/2 Warp Server for e-business "Aurora"											
Linux											
Red Hat Linux 6.0									√		

	Systempro	Systempro LT	Systempro XL	ProSignia	ProSignia 200	ProSignia 300	ProSignia 500	Prosignia NeoServer	Prosignia Server 720	Prosignia Server 740	ProSignia VS
Operating Systems (continued)											
Microsoft											
Windows NT Server 3.51				√	√					√	
Windows NT Server 4.0		√	√	√	√			F	F		
Windows NT Server, Enterprise Edition 4.0											
Windows NT Server 4.0, Terminal Server Edition				√				√	√		
BackOffice Small Business Server 4				√				√	√		
BackOffice Small Business Sever 4.5		√	√	√	√			√	√		
Novell											
NetWare 3.2				√							
NetWare 4.11, SMP (intraNetWare)				√	√			S	√		
NetWare 4.2, SMP				√				F	F		
NetWare 5				√	√			F	F		
NetWare for Small Business 4.2				√				√	√		
SCO											
OpenServer 5.0.4, 5.05		√		√	√	√		5	5	√	
UnixWare 2.1.2, 2.1.3				√	√	√					
UnixWare 7.0.1, 7.1				√							
Windows NT Server 4.0, Terminal Server Edition				√				√	√		
Sun											
Solaris X86 2.5x				√	√	√					
Solaris X86 2.6				√	√	√					
Solaris X86 7				√							

F	Factory-installed operating system
5	OpenServer 5.05 support only
S	No SMP support

For operating systems not listed and for older servers, check www.compaq.com/products/servers/platforms/retired.html.

	ProLiant 400	ProLiant 800	ProLiant 850R	ProLiant 1000	ProLiant 1200	ProLiant 1500	ProLiant 1600	ProLiant 1850R	ProLiant 2000	ProLiant 2500	ProLiant 3000	ProLiant 4000	ProLiant 4500	ProLiant 5000	ProLiant 5500	ProLiant 5500 Xeon	ProLiant 6000	ProLiant 6000 Xeon	ProLiant 6400R	ProLiant 6500	ProLiant 6500 Xeon	ProLiant 7000	ProLiant 7000 Xeon
High Availability																							
Non-Stop Computing Features																							
Advanced Network Control Utility		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Cluster Verification Utility		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hot Spare CPU						√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
On-line Recovery Server Option	√				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Online Storage Controller Recovery Option	√	√	√		√	√	√	√		√	√			√	√	√	√	√	√	√	√	√	√
Redundant Fans											√				√	√	√	√	√	√	√	√	√
Redundant Hot-plug Power Supply					√		√	√			√				√	√	√	√	√	√	√	√	√
Redundant Power Modules											√			√			√	√	√	√	√	√	√
Redundant Power Supply					√	√	√	√			√		√	√	√	√	√	√	√	√	√	√	√
Standby Recovery Server Option	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Rapid Recovery Features																							
ASR	√			√					√			√											
ASR-2		√	√		√	√	√	√		√	√		√	√	√	√	√	√	√	√	√	√	√
Fan Detect and Shutdown		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Hot-pluggable Drives	√		√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√
Hot-plug Fans																			√	√	√	√	√
Hot-plug Keyboard					√		√	√		√	√				√	√	√	√	√	√	√	√	√
PCI Hot Plug																√			√	√	√	√	√
Server Failure Notification	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Server Recovery Notification		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Temperature Detect and Shutdown	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Windows NT HAL Recovery	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Fault Prevention Features																							
ECC Memory	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Power Down Manager																	√	√	√	√	√	√	√
Memory Deallocation				√		√						√	√										
Power Safe Modules														√	√	√	√	√	√	√	√	√	√
Power Safety Interlock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Pre-Failure Warranty	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	ProLiant 400	ProLiant 800	ProLiant 850R	ProLiant 1000	ProLiant 1200	ProLiant 1500	ProLiant 1600	ProLiant 1850R	ProLiant 2000	ProLiant 2500	ProLiant 3000	ProLiant 4000	ProLiant 4500	ProLiant 5000	ProLiant 5500	ProLiant 5500 Xeon	ProLiant 6000	ProLiant 6000 Xeon	ProLiant 6400R	ProLiant 6500	ProLiant 6500 Xeon	ProLiant 7000	ProLiant 7000 Xeon
--	--------------	--------------	---------------	---------------	---------------	---------------	---------------	----------------	---------------	---------------	---------------	---------------	---------------	---------------	---------------	--------------------	---------------	--------------------	----------------	---------------	--------------------	---------------	--------------------

Life Cycle Cost Reduction

Online Server Maintenance

Asset Tag Number	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Board Release Levers																	√	√	√	√	√	√	√
Correctable Memory Log	√	√	√	√		√		√	√	√		√	√	√	√								
Online Configuration Utility for NetWare	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Power Line Monitoring																	√	√	√	√	√	√	√
RAID Online Expansion		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Survey Parameter Capture		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
System Partition Administration Utility	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
System Serial Number	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Temperature Monitor via I ₂ C											√						√	√	√	√	√	√	√
Voltage/Current Monitoring											√						√	√	√	√	√	√	√

Off-line Server Maintenance

Boot Block ROM				√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CD-ROM Boot	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Configurable Boot Order	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Critical Error Logging	√	√	√	√		√		√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
DOS CPR	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Drive Firmware Upgrade	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Failure/Status LEDs	√			√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
Fibre Fault Isolation Utility	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Flashable ROM	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Intelligent Power Switch																	√	√	√	√	√	√	√
PCI Plug and Play	√	√	√		√	√	√		√	√				√	√	√	√		√	√	√	√	√
Power On Error Log	√				√		√		√	√							√	√	√	√	√	√	√
Revision History Table	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
SmartStart	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
System Partition	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	ProLiant 400	ProLiant 800	ProLiant 850R	ProLiant 1000	ProLiant 1200	ProLiant 1500	ProLiant 1600	ProLiant 1850R	ProLiant 2000	ProLiant 2500	ProLiant 3000	ProLiant 4000	ProLiant 4500	ProLiant 5000	ProLiant 5500	ProLiant 5500 Xeon	ProLiant 6000	ProLiant 6000 Xeon	ProLiant 6400R	ProLiant 6500	ProLiant 6500 Xeon	ProLiant 7000	ProLiant 7000 Xeon
Life Cycle Cost Reduction (continued)																							
Remote Capabilities																							
Compaq Insight Manager	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Insight Manager Alerts	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Info Messenger	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Integrated Management Display	√			√		√			√	√					√	√	√	√	√	√	√	√	√
Integrated Management Log	√			√		√			√	√					√	√	√	√	√	√	√	√	√
Integrated Remote Console	√	√	√		√		√		√	√					√	√	√	√	√	√	√	√	√
Remote Alpha/Numeric Paging	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote Diagnostics	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote Insight	√	√	√		√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote Compaq Support Software for Windows NT Upgrade	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remote Threshold Setting	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
SmartStart Integration Management Utility	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Software Updates via Internet	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Investment Protection																							
Long Operating System Life Support	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Industry Standard Components	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Ultra Wide SCSI-3		√	√		√		√	√			√			√	√	√	√	√	√	√	√	√	√
Performance Tracking and Information																							
EISA Bus Utilization Monitor				√	√		√	√	√	√	√	√	√	√	√	√							
Memory Fault Recovery Tracking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Monitor Utility for Smart Array	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
NIC Fault Recovery Tracking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
PCI Bus Monitor	√			√		√	√			√				√	√	√	√	√	√	√	√	√	√
Storage Fault Recovery Tracking	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

	ProLiant 400	ProLiant 800	ProLiant 850R	ProLiant 1000	ProLiant 1200	ProLiant 1500	ProLiant 1600	ProLiant 1850R	ProLiant 2000	ProLiant 2500	ProLiant 3000	ProLiant 4000	ProLiant 4500	ProLiant 5000	ProLiant 5500	ProLiant 5500 Xeon	ProLiant 6000	ProLiant 6000 Xeon	ProLiant 6400R	ProLiant 6500	ProLiant 6500 Xeon	ProLiant 7000	ProLiant 7000 Xeon
Life Cycle Cost Reduction (continued)																							
Security																							
Administrative Password	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
CD Lock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Configuration (NVRAM) Lock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Diskette Drive Control	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Diskette Write Control	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Front Bezel Keylock	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Keyboard Password	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Network Server Mode	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Power On Password	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Power Down Lock																	√	√	√	√	√	√	√
Protected Power Switch	√		√	√																			
QuickLock	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Serial/Parallel Interface Control	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Operating Systems																							
Banyan																							
VINES 7.0		√	√		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√
VINES 8.0		√	√		√	√	√	√		√	√			√	√	√	√	√	√	√	√	√	√
VINES 8.5		√	√		√	√	√	√		√	√			√	√	√	√	√	√	√	√	√	√
IBM																							
OS/2 Warp 4			√		√					√					√	√				√		√	
OS/2 Warp Connect 3		√	√		√		√	√		√	√				√	√	√	√	√	√	√	√	√
OS/2 Warp Server 4		√	√		√		√	√		√	√				√	√	√	√	√	√	√	√	√
OS/2 Warp Server Advanced 4		√	√		√	√	√	√		√	√				√	√	√	√	√	√	√	√	√
OS/2 Warp Server Advanced 4 SMP		√	√		√	√	√	√		√	√				√	√	√	√	√	√	√	√	√
OS/2 Warp Server for e-business "Aurora"		√					√	√		√					√	√	√	√	√	√	√	√	√
Linux																							
Red Hat Linux 6.0		√					√	√															

	ProLiant 400	ProLiant 800	ProLiant 850R	ProLiant 1000	ProLiant 1200	ProLiant 1500	ProLiant 1600	ProLiant 1850R	ProLiant 2000	ProLiant 2500	ProLiant 3000	ProLiant 4000	ProLiant 4500	ProLiant 5000	ProLiant 5500	ProLiant 5500 Xeon	ProLiant 6000	ProLiant 6000 Xeon	ProLiant 6400R	ProLiant 6500	ProLiant 6500 Xeon	ProLiant 7000	ProLiant 7000 Xeon	
Operating Systems (continued)																								
Microsoft																								
Windows NT Server 3.51		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Windows NT Server 4.0	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Windows NT Server, Enterprise Edition 4.0		√	√		√		√	√		√	√				√	√	√	√	√	√	√	√	√	√
Windows NT Server 4.0, Terminal Server Edition	√	√	√			√	√		√	√				√	√	√	√	√	√	√	√	√	√	√
BackOffice Small Business Server 4	√	√				√	√																	
BackOffice Small Business Server 4.5	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Novell																								
NetWare 3.2		√	√		√		√	√		√	√				√	√	√	√	√	√	√	√	√	√
NetWare 4.11, SMP (intraNetWare)	S		√		√	√			√	√		√	√	√		√	√		√	√	√	√	√	√
NetWare 4.2, SMP	√	√	√			√	√	√	√		√				√	√	√	√	√	√	√	√	√	√
NetWare 5	√	√	√		√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√
NetWare for Small Business 4.2	√	√	√				√	√																
SCO																								
OpenServer 5.0.4, 5.0.5	5	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
UnixWare 2.1.2, 2.1.3		√	√		√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
UnixWare 7.01, 7.1		√	√			√	√		√	√				√	√	√	√	√	√	√	√	√	√	√
Sun																								
Solaris X86 2.5x			√	√	√	√			√	√		√	√	√	√		√			√		√		√
Solaris X86 2.6		√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Solaris X86 7		√			√	√	√		√	√				√	√	√	√	√	√	√	√	√	√	√

- 5 OpenServer 5.05 support only
- S No SMP support

For older servers and operating systems not listed, check www.compaq.com/products/servers/platforms/retired.html.