WHITE PAPER

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Compaq Professional Workstation Product Family Positioning White Paper

The intent of this paper is to provide general criteria that aid in the determination of which Professional Workstation product is the best choice for particular application environments. Additionally, it attempts to articulate and clarify, within each of the key application segments, the distinct positioning of each workstation product in relation to Compaq high-end desktop PCs and mainstream servers.

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Workstation Product Family Positioning White Paper

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INTRODUCTION

The Compaq Professional Workstation line offers customers a broad choice of powerful Windows NT/x86 workstations from which to choose. This broad product line meets the needs of a wide spectrum of power users performing financial, computer-aided design (CAD), computer-aided engineering (CAE), digital content creation (DCC) and electronic design automation (EDA) applications.

Users in each of the targeted application segments have unique product requirements, dictated by the specialized nature of the complex applications they use. For example, users performing video editing -- in which video scenes are added, moved or deleted with the aid of a computer -- require a high degree of expandability to accommodate components such as audio/visual drives, video capture boards, etc. In contrast, Web site development, another DCC application, typically requires little expandability - just a fast processor and (perhaps) 3D graphics.

To help determine which Professional Workstation product is most appropriate for users in particular application segments, this paper will first give an overview of the product line. Then, it will provide a description of each application segment, and describe why a particular product is most appropriate for that segment. In some instances, multiple products may be appropriate for the same segment due to the existence of subsegments with differing needs. The paper will highlight those cases, and provide some broad rules of thumb to help determine which product is most appropriate. Additionally, this paper will position and rationalize the new workstation products relative to the Compaq high-end desktop PCs and mainstream server products.

PRODUCT OVERVIEW

Each Professional Workstation product has been designed to meet the needs of users within specific application segments. Following is a table comparing the key features of the Compaq Professional Workstation line of products:

	Professional Workstation 5000	**Professional Workstation 5100**	**Professional Workstation 6000**	**Professional Workstation 8000**
PROCESSOR	1-2 Pentium Pro 200MHz	1-2 Pentium II 266MHz & 300MHz	1-2 Pentium II 266MHz & 300MHZ	1-4 Pentium Pro 200MHZ
FORM FACTOR	Towerable Desktop	Towerable Desktop	Minitower (Rackable)	Minitower (Rackable)
MAXIMUM MEMORY	512 MB	512MB	512MB	3GB
BAYS	4	5	10	10
SLOTS	5	5	6	6
2D GRAPHICS	Matrox Millenium	Matrox Millennium II	Matrox Millennium II	Matrox Millennium II
3D GRAPHICS	ELSA Gloria-L	ELSA Gloria-XL	ELSA Gloria-L or Diamond Fire GL 4000	Diamond Fire GL 4000
CD ROM	8X	24X Max	16X Max	16X Max

Table 1. Comparison of Professional Workstation Product Line Key Features

The *Compaq Professional Workstation 5000* has become the workstation standard for a number of customers, especially in the financial segment. This product remains in the line to provide these customers with a product life cycle duration that matches their purchasing cycles. It also provides very price sensitive customers with a lower entry price for a workstation solution.

The *Compaq Professional Workstation 5100* provides industry-leading performance in a desktop form factor for customers in the financial, CAD, DCC and EDA segments. The Compaq

Professional Workstation 5100 is an ideal solution for customers requiring the highest performance in spaced constrained environments such as financial traders in New York and London. Additionally, users performing electronic design automation – who typically have little expandability requirements – will find the level of performance they require for their applications. CAD upsizers, such as those running AutoCAD, may also prefer the 5100 since it provides a powerful, yet more affordable solution than either the Compaq Professional Workstation 6000 and 8000.

The *Compaq Professional Workstation 6000* also provides industry-leading performance, and with the added feature of increased expandability for customers in the CAD and DCC segments requiring this enhanced functionality. For example, many users performing MCAD prefer a tower design due to either a real or perceived need for greater expandability than provided by desktop form factors. The Professional Workstation 6000 also offers two levels of 3D graphics to meet the wide range of user needs that exist in these segments. Models with the Diamond Fire GL 4000 offer high performance 3D graphics for users working in demanding, true color 3D visualization environments. In particular, users moving from traditional RISC/UNIX environments will find the performance and features they have come to expect in 3D workstations with the Diamond Fire GL 4000 models. A model with the ELSA Gloria-L 3D graphics controller provides unmatched 3D price/performance for users who need the flexibility to support a variety of resolutions and color depths in 3D CAD applications.

Our top of the line product, the *Compaq Professional Workstation 8000*, provides the highest levels of performance through advanced multiprocessing capabilities for very compute intensive applications in the CAE and DCC segments. Combining the capability to support up to 4 processors with memory expansion of up to 3GB means this product is appropriate for extremely compute-intensive applications, such as Finite Element Analysis (FEA) and render/analysis farm applications -- formerly only the province of expensive and proprietary RISC/UNIX machines.

(For more information on the key features incorporated in the Compaq Professional Workstation 5100, 6000 and 8000 products, please see their respective "Key Technologies White Paper")

MATCHING PROFESSIONAL WORKSTATION PRODUCTS WITH THE APPROPRIATE APPLICATION SEGMENT

The table below provides broad guidance in determining which product is most appropriate for a given application segment. As mentioned previously, some degree of overlap typically exists in each of the segments. Within a specified segment, such as CAD, a fairly broad spectrum of requirements exists across the user base. The expanded Compaq Professional Workstation line now offers customers a variety of options so they can choose the product that best meets their requirements. For example, in the CAD segment, the Compaq Professional Workstation 5100 provides an affordable, space-saving CAD workstation, while the Compaq Professional Workstation 6000 appeals to users requiring greater performance and expandability.

Table 2. Listing of Professional Workstation Target Market by Product

	Finance	CAD	CAE	DCC	EDA	Other
Professional Workstation 5000/5100	✓ Trading	✓ MCAD/AEC (2D/3D Design, Solids modeling, Plant design)		✓ Graphics design, Animation, Web authoring	✓ Design entry & editing, Layout	✓ Software development
Professional Workstation 6000	Trading	✓ MCAD/AEC (3D Design, Solids modeling, Plant design, req. fast 3D graphics)	✓ Part and small assembly analysis	✓ Animation, Video editing, Compositing	✓ Place and route, Verification	✓ Software development
Professional Workstation 8000	Risk management; Financial analytics	MCAD (Large assembly modeling and design having large mem. req.)	✓ FEA, Thermal & vibration analysis; Computational fluid dynamics	✓ Final rendering, Image processing	✓ Synthesis, Simulation	✓ Geophysical

Following is a more detailed description of each of the application segments followed by a brief discussion of which Professional Workstation product(s) are most appropriate for that segment.

Computer Aided Design (CAD)

CAD involves designing mechanical objects in software that display the design in a two or three-dimensional representation. The designer sees a real-life representation of the object that can be rotated and manipulated. These applications require fast 2D or 3D graphics hardware and fast processors for improved interactivity when creating the model. Two major subsegments that exist in the CAD market are: Mechanical CAD, typically shortened to MCAD, and A/E/C, short for "Architectural, Engineering and Construction".

Mechanical (MCAD)

MCAD deals with designing objects, from more simplistic tasks such as computerized drafting, to more complex tasks such as 3D solids modeling. The primary applications in this segment include AutoCAD, Microstation, Pro/Engineer, Unigraphics, SolidWorks and I-DEAS.

Segment Characteristics

- Tremendous momentum towards Windows NT/X86 in the low-end to midrange sector
- All major UNIX CAD ISVs have or will port to Windows NT
- Market expansion due to small business adoption

Product Requirements

- Fast 2D or 3D graphics depending on overall application requirements
- Latest processor to enhance speed of interactivity; multiprocessing support currently not a key requirement since most applications still single-threaded
- Expandability of slots and bays often key

Product Fit

- The Compaq Professional Workstation 5000 is typically most appropriate for price sensitive customers not requiring a great deal of expandability, such as users performing primarily 2D applications. The Compaq Professional Workstation 5100 brings the latest technologies to these same users who prefer the smaller form factor.
- The Compaq Professional Workstation 6000 is appropriate for those customers who need greater expandability than offered by the Professional Workstation 5100 product. In particular, customers performing complex, 3D solids modeling will typically benefit from the enhanced graphics offerings of the Professional Workstation 6000 product.

AEC

AEC deals with the design of structures such as manufacturing plants.

Segment Characteristics
- Market for Windows NT/x86 solutions now stronger than for UNIX based solutions
- Since many architectural firms are relatively small, customers tend to be fairly price sensitive

Product Requirements
- 3D graphics for modeling, such as when doing architectural walkthrough applications
- Latest processor to enhance speed of interactivity; multiprocessing support currently not important since applications tend to be single-threaded

Product Fit
- Due to the price sensitivity of the AEC segment, the Professional Workstation 5100 will most likely be the product of choice for customers.
- For customers designing complex, architectural walkthroughs, the Professional Workstation 6000 may be the better choice for its higher performing graphics solution.

Computer Aided Engineering (CAE)

After an object has been designed using CAD software, it must then be subjected to various types of computer analysis to ensure the overall integrity of the design. This analysis, generally known as Computer Aided Engineering, includes stress or finite element analysis, vibration analysis, and thermal analysis. In all instances, a design is treated as a collection of points with various physical inputs applied to those points. The effect of those inputs at those points on the design are determined mathematically. These applications are very compute intensive requiring the highest performing processor, memory, and disk subsystem performance. The analysis can be done at the designer's workstation, or the work can be distributed to a group of computers.

In a *non-distributed environment,* the analysis is done on the same workstation on which the design was developed. In this environment, the designer requires a workstation with 3D graphics to develop the initial model, as well as the highest performance subsystem to perform the compute-intensive analysis work.

In the *distributed model,* the analysis may be done on a series of computers. In one instance, a small engineering firm might connect all their workstations over their network, and at night, use the processing power of each to analyze the model. In another instance, a larger engineering firm may have a pool of dedicated computers (an "analysis farm") to perform the analysis. This dedicated farm is often in a back room and may be rack mounted.

Segment Characteristics
- Strong UNIX install base and infrastructure
- Floating-point intensive applications
- May be performed by computers in a back room analysis farm or on a computer at the designer's desk

Product Requirements

- Very compute intensive applications which require processor scalability and high memory expandability
- Backroom machines need fast processors, memory expandability beyond 512MB, 2D graphics and minimal slot/bay expandability
- Machines used at designer's desk must satisfy 3D mechanical modeling requirements as well as have the power to run compute intensive analysis applications

Product Fit

Both the Compaq Professional Workstation 6000 and 8000 are targeted at the CAE segment.

- With dual processor capabilities and system memory expandable to 512MB, the Compaq Professional Workstation 6000 is ideal for the designer who does occasional analysis on his/her own design machine.
- With scalability up to four processors and memory expandable to 3GB, the Compaq Professional Workstation 8000 is ideal for applications with large data sets requiring maximum computing power. Additionally, both of these workstations are rackable providing customers with a high density solution when used in a back room "analysis farm."

Digital Content Creation (DCC)

DCC deals with 2D and 3D animation/rendering, publishing, Web site development, and film and video editing

3D Animation/Rendering

3D Animation/Rendering refers to the final creation of a computer-generated 3D animation sequence. An animation sequence is essentially a series of still pictures shown in rapid succession to create the perception of motion. In computer-generated 3D animation, a designer initially models the animation sequence in a simplified 3D shading environment, which involves applying light to the design, and then adding various surfaces and textures to achieve the desired effect in the scene. When the sequence is complete, the final shading (or Final Render) is done with much more accurate lighting and shading equations and algorithms. In this process, the software renders each frame separately, effectively creating a series of still pictures. The pictures are then strung back together and transferred to a playback medium such as a disk file or videotape. This process requires 3D graphics for the design portion, while the final render requires multiple processors and extensive memory expandability. As with analysis applications, the final render may be done on an individual designer's machine, or if especially compute-intensive, sent to a backroom "render farm" where the rendering process is done in batch mode by workstations dedicated to the task.

Segment Characteristics

- Small but emerging marketplace; therefore not hampered by legacy systems
- Major applications already ported to Windows NT
- Game authoring growth
- Animation market growing, driving greater demand for workstation products

Video Editing

Video editing refers to using a computer to edit video footage. The editing includes adding computer generated effects (including 3D animation), as well as traditional editing functions of deleting and moving scenes around (often called non-linear video editing). This application requires expandability for adding audio/visual drives, video capture boards, and other specialized peripherals.

Segment Characteristics for Video Editing

- Low end moving to Windows NT while high end still very UNIX centric

- Explosive growth, almost all Windows NT based
- Relatively low output quality required

Product Requirements for both 3D Animation/Rendering and Video Editing

- 3D graphics
- Multiprocessing capabilities; many animation applications already multi-threaded
- MP support and memory expandability especially important for final render applications
- Slot and bay expandability for video editing applications

Product Fit

All three of the Professional Workstation products are appropriate for specific applications in this segment.

- The Professional Workstation 5100 provides 2D/3D graphics, dual processor and memory expansion capabilities to meet the requirements of basic design, animation and website development applications.
- The Compaq Professional Workstation 6000 provides a more expandable workstation with the latest processor technology for those customers requiring best performance for their design and editing applications. In particular, the Professional Workstation 6000 is well suited for the needs of users running video editing applications who need the greater expansion capabilities of this product relative to the Professional Workstation 5100. In addition, the Professional Workstation 6000 offers models with the Diamond Fire GL 4000 graphics controller for those users in the 3D animation space who need fast, true color support at 1280 X 1024 resolution.
- With its high degree of processor scalability, memory expansion, and rackable design, the Compaq Professional Workstation 8000 provides an excellent final rendering solution, particularly in render farm applications. The Compaq Professional Workstation 8000 also supports 3D graphics and can be used in those instances where both design and rendering are done on the same workstation.

Electronic Design Automation (EDA)

EDA involves using the computer to design and simulate the performance of electronic circuits on a chip or system board.

Printed Circuit Board (PCB) Layout

The process of placing components on a printed circuit board and determining the most optimal way to connect the components. This requires 2D graphics and fast processor performance.

Segment Characteristics – PCB Design

- Printed Circuit Board (PCB) Segment still very Windows 3.1/95 centric; strong movement to Windows NT occurring
- PC upsizers looking for greater functionality to meet increasing PCB software requirements

Product Requirements – PCB Design

- Latest processor, strong Windows NT support, 2D graphics

Integrated Circuit Design (IC Design)

Integrated circuit design in EDA is the process of designing a chip at the actual transistor level. The chip's behavior is modeled in software, tested, and the design is then transferred to silicon. The work is very compute intensive due to the number of transistors involved. Multiple processor support and 1GB+ memory expandability are critical.

ASIC Design

ASIC (Application Specific Integrated Circuit) design is similar to IC design; however, it is accomplished for a specific application. Often not a completely custom design, ASICs may use existing circuit libraries and other tools to simplify the work. Like IC design, multiple processor support and 1GB+ memory expandability are critical for ASIC design.

Segment Characteristics for Integrated Circuit/ASIC Design

- Strong UNIX installed base requires large memory configurations and processing power
- Highly compute intensive applications may wait until Merced (future Intel processor technology) to be ported to Windows NT.
- Verification/Layout applications last to migrate due to compute intensive nature of application.

Product Requirements

- Very, compute intensive – requires fastest processor available
- Multiprocessing capabilities (scalability), memory bandwidth and expandability

Product Fit

- The Compaq Professional Workstation 5100 is a good choice for customers performing PCB layout, with or without ASICs in the board design.
- The Professional Workstation 6000 may be useful for these same customers, but is more likely to be used when the customer requires greater expansion capabilities.
- The Professional Workstation 8000 is targeted at users performing integrated circuit and ASIC design. With its processor scalability and memory expandability up to 3GB, this machine provides an excellent solution for customers running these compute and resource intensive applications.

Finance

The Finance segment includes applications such as economic and financial modeling, as well as financial trading, and is a key business segment for Compaq Professional Workstation products.

Segment Characteristics

- Strong movement to Windows NT among SUN trader workstation install base
- Large PC upsizer segment also exists; may have been using Deskpro XL as trader workstation

Product Requirements

- Fast processor to handle the multitude of applications and data feeds traders have running simultaneously
- Fast 2D windowing
- Multiprocessor support often required since certain key applications are multithreaded
- Need space saving form factor since desk space at a premium

Product Fit

The Professional Workstation 5100 is the primary product targeted towards this segment due to the extreme space constraints that most traders endure. Additionally, the Professional Workstation 5100 includes a model with STB MVP Workstation graphics controller that supports multiple monitors on a single card. Using this graphics controller, the Professional Workstation can support up to eight monitors while occupying only two PCI slots. The Professional Workstation 5100 with the STB graphics controller enables financial customers, especially financial traders who require multiple monitors, to maximize the number of displays they need to run on a single workstation. While financial traders will typically prefer the fast processing capability of the Pentium II processor in the Professional Workstation 5100, both the

Professional Workstation 6000 and 8000 products can be used as backroom financial compute engines.

PROFESSIONAL WORKSTATION POSITIONING VIS A VIS COMPAQ HIGH END DESKTOP PCS

Since the Professional Workstation product line and the Deskpro 6000 line share several key features, such as the latest version of the Intel processor and a desktop form factor in the Professional Workstation 5100 product, a degree of confusion has arisen regarding which product is most appropriate for certain application segments.

The Professional Workstation and the Deskpro 6000 have been designed with fundamentally different objectives in mind. The Deskpro 6000 has been developed for a broad, horizontal user base desiring high performance and a rich feature set - all at extremely competitive prices. The target customer is the power user in the PC upsizer market; that is, the user moving up the x86 price/performance curve who can justify a PC that is faster than their current system. Since the Deskpro 6000 has been developed for the horizontal market, its goal is to be as flexible as possible in meeting the needs of a variety of users. For example, it supports a wide array of processor options and client operating systems since the final environment in which it will be used cannot be well predicted. However, broad targeting also means the Deskpro 6000 has been optimized for a *horizontal* customer base - not for any particular application segment since its goal is to have as wide an appeal as possible.

In contrast, the Compaq Professional Workstation has been specifically optimized to meet the needs of the targeted application segments, such as CAD, DCC, EDA and financial trading. Compaq Professional Workstations will appeal to an array of professional/technical users in both the upsizer and downsizer markets due to the powerful features provided - particularly its enhanced performance, multiprocessing capability, and application segment focus. Optimization of the Professional Workstation for specific application segments leads to a number of key differences between it and the Deskpro 6000.

Optimized for the stringent performance requirements of the targeted vertical application segments.

- Compaq Professional Workstations incorporate a Highly Parallel System Architecture design that significantly increases overall performance in demanding applications. In fact, Compaq Professional Workstations deliver the fastest performance among x86 competitors, and can meet, or beat, the performance of many traditional RISC/UNIX machines as well. This new architecture includes dual memory controllers, dual-peer PCI buses, and advanced multiprocessing support. The net effect is a significant increase in overall system bandwidth, and ultimately, overall application performance.
- Additionally, only the highest performance components and subsystems are used to ensure that overall system performance is maximized. The Compaq Professional Workstations include a 40MB/sec Wide-Ultra SCSI subsystem compared to the Deskpro's 20MB/sec Ultra SCSI solution. The Professional Workstation incorporates a 10/100Mbit autosensing NIC as standard equipment (the Compaq Professional Workstation 5100 also includes Remote Wakeup capabilities using the Magic Packet technology), and uses ECC memory that is expandable in one of our products up to 3GB.

Optimized to provide the advanced features that the targeted application segments demand

- The Professional Workstation offers the scalability and expandability that many users in these vertical segments demand. For example, the Professional Workstation 6000 and 8000 products provide up to 6 PCI slots and 10 drive bays - a level of expandability not found in the Deskpro 6000. In addition, the Compaq Professional Workstation offers

significant levels of scalability as well, such as the ability of the Professional Workstation 8000 line to accommodate up to 4 processors and 3GB of memory.

- The Professional Workstation products offer high performance 3D graphics solutions that meet the specialized needs of users in the CAD and Digital Content Creation segments.

Optimized to ensure the highest levels of performance and application compatibility when running complex applications such as MCAD, 3D animation and CAE.

- Compaq Professional Workstations are tested and certified to ensure the highest levels of application compatibility for users running complex applications in areas such as Mechanical CAD, 3D animation and CAE. Compaq application engineers work closely with their counterparts at key ISVs to ensure our Professional Workstation products have been integration tested and certified.

Optimized to provide seamless integration into customers' computing environments.

- SmartStart for Workstations provides flexible, optimized installation and integration of the operating system, support software including drivers and management agents, and interoperability applications.
- Hummingbird NFS and X-windows applications are provided through SmartStart for Workstations on a "Try and Buy" basis for easy connectivity into UNIX environments.

Diagram 1 summarizes how the Professional Workstation products are positioned in relation to each other and in relation to the Deskpro 6000.

Compaq Professional Workstation Product Positioning

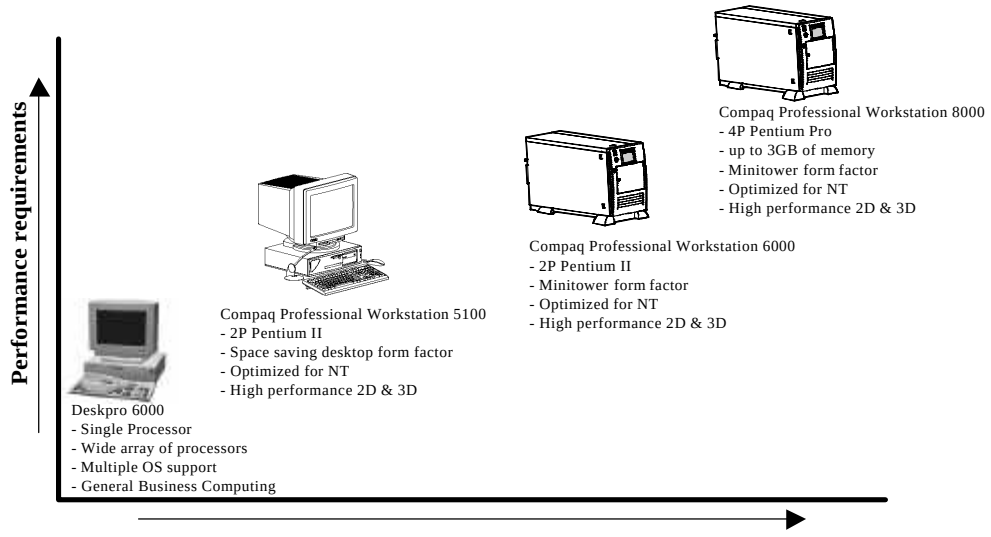

Diagram 1: Professional Workstation product line positioning

PROFESSIONAL WORKSTATION POSITIONING VIS A VIS COMPAQ MAINSTREAM SERVERS

In certain instances, customers may ask about the appropriateness of deploying Compaq Professional Workstations as low-cost servers. Although there are some similarities between the feature sets and form factors of the Professional Workstation products and Compaq servers, each product class is optimized for a very different set of applications and uses, and thus generally do not serve as appropriate alternatives to the other.

- Servers include redundancy features to support the high availability requirements customers demand for network file and print servers. Although designed to be very reliable, Professional Workstations do not include redundancy features, such as storage fault tolerance or redundant power supplies and fans, since customers in the targeted application segments would not be willing to pay for unnecessary features.
- Servers are tested and optimized for the server version of network operating systems and not for client operating systems like Microsoft Windows NT Workstation.
- Only basic graphic capabilities are required for servers while workstation applications typically require high-performance 2D and 3D graphics capabilities
- Workstations are optimized and tested to run the specific applications in each target segment; whereas servers are tested with a different set of applications, such as database, internet/intranet, file/print, etc

These comparisons indicate that each class of product -- desktops, workstations and servers -- has been optimized to meet the unique requirements of specific customer segments.

SUMMARY

With the Compaq Professional Workstation product family, Compaq provides customers within the CAD/CAE, Finance, EDA and Digital Content Creation segments a broader array of choices. Since users in each of the targeted application segments have distinct product requirements dictated by the complex applications they run, matching Professional Workstation products with the appropriate segment becomes key.

APPENDIX

Table 3: Feature comparison of Compaq Professional Workstation and comparable Compaq desktop and server products.

Feature	Deskpro 6000	Professional Workstation 5100	Professional Workstation 6000	ProLiant 800	ProLiant 850R	ProLiant 2500
Processor	Pentium Pro 200MHz	Pentium II 266MHz	Pentium II 266MHz	Pentium Pro 200MHz	Pentium Pro 200MHz	Pentium Pro 200MHz
L2 cache	256K	512K	512K	256K	256K	512K
SMP	1P only	1-2P	1-2P	1-2P	1-2P	1-2P
Form Factor	Desktop or Minitower	Desktop	Minitower	Minitower	Rack system	Minitower
Rackable	No	No	Yes	Yes	Yes	Yes
Bays	5- 2 open (minitower)	5- 2 open	10- 7 open	5- 2 open	5 bays- 3 open	10- 7 open
Slots	5- 2 open	5- 4 open	6- 5 open	7 – 6 open	4- 4 open	6 open
Standard/ Maximum RAM	32MB/ 192MB	32MB, 64MB/ 512MB	32MB, 64M, 128MB/ 512MB	32MB/ 512MB	32MB/ 512MB.	32MB, 64MB/ 1GB
Type of Memory	60ns EDO SIMMs	Buffered EDO, ECC 60ns DIMMs	Buffered, EDO, ECC, 60ns DIMMs	Unbuffered, EDO, ECC, 60ns DIMMs	Unbuffered EDO ECC 60ns DIMMs	Buffered, EDO, ECC, 60ns DIMMs
Hard Drives/Max. Internal Storage	1.2GB 2.5GB/ 7.5GB max	2.1GB, 4.3GB, 9.1GB/ 22.5GB max	2.1GB, 4.3GB, 9.1GB/ 54.6GB max	2.1GB, 4.3GB, 9.1GB/ 27.3GB	2.1GB, 4.3GB, 9.1GB/ 26.8GB	2.1GB, 4.3GB, 9.1GB/ 54.6GB
SCSI (or Interfaces)	Ultra SCSI	Integrated Wide-Ultra SCSI	Integrated Wide-Ultra SCSI	Integrated Wide-Ultra SCSI	Integrated Wide-Ultra SCSI	Integrated Wide-Ultra SCSI
NIC	Integrated Netelligent 10BaseT Ethernet	Netelligent 10/100 TX Embedded UTP/Coax Controller	Netelligent 10/100 TX Embedded UTP Controller	Integrated 10Base-T Ethernet, Upgradable to 100Mb/s	Integrated 10/100 TX Ethernet	Integrated 10/100 Ethernet
2D Graphics (Base)	Millennium	Millennium II	Millennium II	Integrated 1024 x 768, 256-colors	Integrated PCI, 1024 x 768, 256-colors	Integrated 1024 x 768 by 256 color
2D Graphics Memory Standard/Max	2MB/8MB	4MB/16MB	4MB/16MB	1MB/2MB	1MB/2MB	1MB/2MB
3D Graphics	NA	Gloria-XL	Gloria-L/Fire GL	NA	NA	NA
CD-ROM	8X IDE	24X Max IDE	16X Max IDE	8X IDE	8X IDE	8X IDE
Floppy drive	1.44MB/LS-120	1.44MB	1.44MB	1.44MB	1.44MB	1.44MB
Mouse	2 button	2 or 3 button	2 or 3 button	2 button	2 button	2 button
Audio	ESS 16-bit card	PremierSound Audio	PremierSound Audio	NA	NA	NA
Operating System Support	NT 3.51/4.0 Supports Win 95, DOS/Windows 3.1, OS/2	NT 3.51/4.0 Supports Win. 95, Solaris	NT 3.51/4.0 Supports Win. 95, Solaris	NT Server 3.51/4.0, Intranet Ware and NetWare, OpenServer and UnixWare, OS/2 Warp	NT Server 3.51/4.0, Intranet Ware and NetWare, OpenServer and UnixWare, OS/2 Warp	NT Server 3.51/4.0, Intranet Ware and NetWare, OpenServer and UnixWare, OS/2 Warp
Set-up and Integration	Preinstalled	SmartStart for WS	SmartStart for WS	SmartStart	SmartStart	SmartStart
PC-to-UNIX Integration SW Available	NA	Yes	Yes	NA	NA	NA

*Based on estimates for June 1997

Table 4: Feature comparison of Compaq Professional Workstation 8000 and comparable server products.

Feature	Compaq Professional Workstation 8000	ProLiant 2500	ProLiant 5000	ProLiant 6000
Processor	Pentium Pro 200MHz	Pentium Pro 200MHz	Pentium Pro 200MHz	Pentium Pro 200MHz
L2 cache	512k	512k	512k	512k
SMP	1-4P	1-2P	1-4P	1-4P
Form Factor	Minitower	Minitower	Minitower	Tower
Rackable	Yes	Yes	Yes	Yes
Bays	10- 7 open	10- 7 open	6 bays – 4 open hot-pluggable drive bays	6 removable media bays- 4 open hot pluggable drive bays - 18x1" or 12x1.6"
Slots	6- 5 open 2- PCI 4-PCI/ISA	6 open 2-PCI 4-PCI/EISA	8- 7 open 5-PCI 2-PCI/EISA 1-EISA	11 slots- 10 open 9 PCI 2 EISA
Standard/ Maximum RAM	128MB/ 3GB	32MB, 64MB/ 1GB	64M, 128MB/ 4GB	64MB, 128MB/ 4GB
Type of Memory	Buffered, EDO, ECC 60 ns DIMMs	Buffered, EDO, ECC, 60ns DIMMs	Buffered, EDO/FPM DIMM	Buffered, EDO/FPM DIMM
Hard Drives/Max. Internal Storage	2.1GB, 4.3GB, 9.1GB/ 54.6GB	2.1GB, 4.3GB, 9.1GB/ 54.6GB	2.1GB, 4.3GB, 9.1GB/ 36.4GB	2GB, 4GB, 9.1GB/ 109.2GB
SCSI (or Interfaces)	Integrated Wide-Ultra	Integrated Wide-Ultra	Integrated Fast-Wide SCSI 2	Dual Channel Integrated Wide-Ultra SCSI (2x40MB/s)
NIC	Integrated 10/100 Ethernet	Integrated 10/100 Ethernet	Integrated 10/100 Ethernet	Integrated 10/100 Ethernet
2D Graphics (Base)	Millennium II	Integrated 1024 x 768 by 256 color	Integrated 1024 x 768, 256-colors	Integrated 1024 x 768, 256-colors
2D Graphics Memory Standard/Max	4MB/16MB	1MB/2MB	1MB/2MB	1MB/2MB
3D Graphics	Fire GL	NA	NA	NA
CD-ROM	16X max IDE	8X IDE	4X IDE	8X IDE
Floppy drive	1.44MB	1.44MB	1.44MB	1.44MB
Mouse	2 button or 3 button	2 button	2 button	2 button
Audio	Integrated 16-bit	NA	NA	NA
Operating System	NT 3.51/4.0 Supports Win. 95	NT Server 3.51/4.0, IntranetWare and NetWare, OpenServer and UnixWare, OS/2 Warp	NT Server 3.51/4.0, IntranetWare and NetWare, OpenServer and UnixWare, OS/2 Warp	NT Server 3.51/4.0, IntranetWare and NetWare, OpenServer and UnixWare, OS/2 Warp
Set-up and Integration	SmartStart for Workstations	SmartStart	SmartStart	SmartStart
PC-to-UNIX Integration SW Available	Yes	NA	NA	NA