HEWLETT®
PACKARD

Leading-edge

Technical
Computing

Technical
computing

Make the best of your day
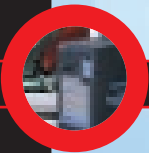
Technical Computing

HP VISUALIZE Workstations and Technical Servers give you more choices by bringing

you MORE POWER. The power to be faster. Work with larger models. Cut costs.

Cut time to market. And streamline processes. Helping you Make the best of your day.

HP VISUALIZE Personal Workstations

Powered by Intel high-end processors, these Workstations give you world's fastest visualization on Windows NT or Linux. See pages 4, 5 and 6.
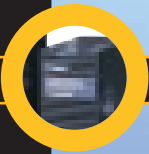
HP VISUALIZE UNIX® Workstations

Featuring the world's fastest processors, these UNIX Workstations offer industry-leading performance and the rock-solid 64-bit HP-UX 11.0 operating system. See pages 7, 8, 9 and 10.

HP Technical Servers

HP offers a full range of servers tuned for high performance and high performance density mission-critical technical computing. See pages 11, 12 and 13.
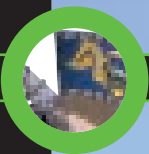
HP VISUALIZE-*fx* Graphics subsystems

See your work in a totally new light with advanced features standard for all HP VISUALIZE graphics subsystems. See page 14.

Accessories

There is more than just computing power and graphics systems. See pages 15 and 16.

How HP Technical Computing

helps you

Make the best of your day.

1 ### Broadest range

From entry-level to high-end, HP offers you the broadest range of Workstations and Technical Servers for graphic-intensive and mission-critical applications. The right equipment for every need, every budget.

2 ### We give you power

You need all the power and performance you can get. HP helps you stay on the leading edge of Workstation and Server technology. We work closely with ISVs to optimize performance – as reflected in benchmark reports.

3 ### Ready for the future

All HP Servers and Workstations offer the latest PA-RISC and Intel processors. And they're designed to offer a smooth transition to the processor of the future, the IA-64, which will allow you to run both HP-UX, NT and Linux on the same hardware – and even at the same time. Who else can match that?

4 ### Investment protection

Go with the price/performance leader. We will still be around when you need us. And you can count on us to protect your investment and provide smooth paths to meeting your future needs.

5 ### More for less

Programs like Power Up with HP! (for Workstations) and TradeUp (for Servers) give you more for less. Whatever's new, you can get it at lower cost. And save even more through time-limited specials.

6 ### Ready for the new millennium

All new HP Technical Computing products are fully Y2K compliant*.
Special rebate programs offer attractive deals on hardware upgrades for users still running HP-UX 9.1 or earlier.

*Operating system HP-UX 10.20 or later, or appropriate patch. Free upgrade from 9.1 to 10.20.

Intel-based power
to visualize

HP VISUALIZE Personal Workstations forms a new family of high-performance Intel-based systems featuring Intel's new Pentium III and Pentium III Xeon processors. These new systems meet the growing demand for value-added, built-to-order workstations, the most advanced graphics technologies, and leadership 3D application performance in a Windows NT or Linux environment for technical and creative applications.

HP
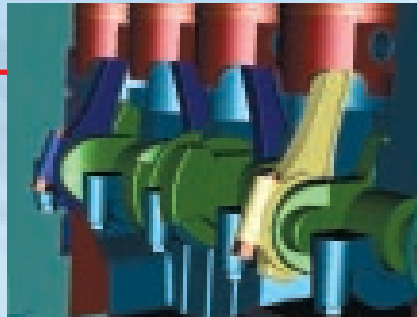**VISUALIZE**
PERSONAL
WORKSTATIONS

P-Class

Superior Intel-based graphics performance at an affordable price

The HP VISUALIZE P500, P550 and P600 Personal Workstations deliver affordable, advanced processing power and graphics performance to engineers, designers, scientists and artists who interact with large models in complex workflow environments.

The HP P-Class Personal Workstation is available with either a single or dual Intel Pentium III processor using Intel's 440BX chip set the model number indicates the clock rate. P-Class Workstations can be equipped with your choice of graphics card: ELSA GLoria Synergy$^+$, HP VISUALIZE-$fx2$+ or -$fx4$+.

X-Class

World's fastest Intel-based visualization performance

HP VISUALIZE X500 and X550 Personal Workstations are designed for advanced professional users who perform simulations, virtual prototyping, complex modeling and high-end visualization tasks and who demand leading-edge graphics performance and processing power.

HP X-Class Personal Workstation is available with either a single or dual Intel Pentium III Xeon processors using Intel's 440BX chip set. Here again, users can choose between the X500 with the new Intel Pentium III Xeon 500-MHz processor and the X550 (550 MHz). The X-Class supports the ELSA GLoria Synergy$^+$, HP VISUALIZE-fx2+, -fx4+ and the top-of-the-range -fx6+ graphics subsystem.
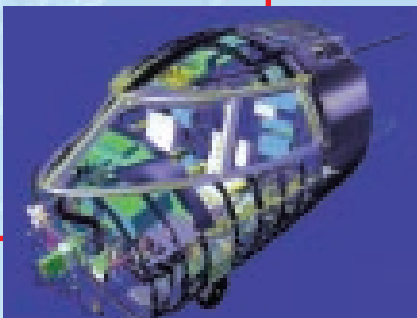
Built to order

HP VISUALIZE Personal Workstations are built to-order, allowing you to select your exact configuration and price point. Systems are delivered from HP direct.

PL and XL – Cool!

For users who want Intel Pentium-based workstations with UNIX reliability and functionality, the HP VISUALIZE PL500 Personal Workstation offers the same basic specs as the HP VISUALIZE P500, but comes with Linux RedHat 6.0 pre-installed.

Similarly, the Linux version of the X550 is called the HP VISUALIZE XL550 and also has Linux Red Hat 6.0 pre-installed.

The XL and PL workstations come with an ELSA GLoria Synergy$^+$ graphics subsystem, the ideal solution for 2D and entry-level 3D applications.

Double
the power

HP – undisputed leader in the overall workstation market (UNIX and Windows NT) with the most comprehensive family of workstation solutions – continues to dramatically expand the breadth of the HP VISUALIZE family. At the high end are four new HP VISUALIZE UNIX workstations based on the award-winning PA-8500 processor.

HP
VISUALIZE
UNIX®
WORKSTATIONS

Optimized architecture

Fully optimized to exploit the benefits of its award-winning* PA-8500 processor, these newly designed systems deliver twice the CPU performance, memory and I/O bandwidth, disk transfer rate and reliability of the previous generation. They also offer application binary compatibility and significantly lower list prices, continuing HP's tradition of delivering industry-leading system, graphics and applications performance
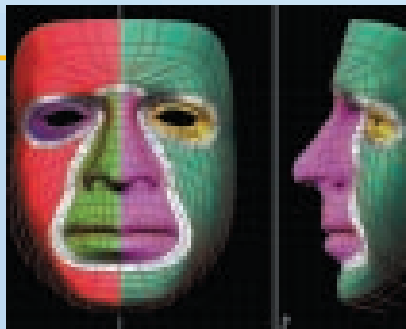
B180L

A perfect balance of form, fit and function

Powered by the PA-7300LC processor, this workstation offers outstanding performance at a low price and one of the smallest footprints in technical computing today. These systems transform your desktop with affordable, category-leading performance for 2D/3D CAD and solids modeling – ideal for CAD engineers designing medium-sized assemblies and components, and as a low-end electrical engineering workstation.

B1000

New entry level PA-8500 workstation

Clocked at 300 MHz, the HP VISUALIZE B1000 workstation delivers fast application performance, large disk and RAM capacity and a 64-bit CPU – all at a great price. This workstation is for CAD designers and 3D solid modelers designing medium-sized assemblies and components and for electrical engineers requiring above-average simulation and synthesis performance at a low-end price.

*Microprocessor Report Editor's Choice 1999

C3000

New desktop performance leader

The HP VISUALIZE C3000 workstation raises the standard for engineering desktops to new heights, outperforming the highest-performing systems currently available. Powered by a 400-MHz PA-8500 processor it breaks through all the traditional bottlenecks of computation and desktop 3D design.

The C3000 is the first uniprocessor workstation to score above a gigaflop in the Linpack benchmark an industry-standard benchmark (supercomputing potential for scientific and engineering applications). It is the ideal platform for mechanical engineers performing simulations, virtual prototyping, complex modeling and high-end visualization, and for electrical engineers doing complex IC design tasks.

World's fastest processor

All three 1000 Series workstations feature the HP PA-8500 PA-RISC (Precision Architecture Reduced Instruction Set Computing) chip offering the industry's largest on-chip cache of 1.5 MB minimizing system latency and boosting performance.

New HP VISUALIZE UNIX Workstations at a glance

Model	B1000	C3000	J5000	J7000
Benchmarks/ Configuration	(1-way)	(1-way)	(2-way)	(4-way)
Processor	PA-8500	PA 8500	PA-8500	PA-8500
Clock	300 MHz	400 MHz	440 MHz	440 MHz
SPECint95	22.4	30.3	32.6	32.4
SPECfp95	38.8	48.6	52.3	45.8
SPECint_rate95	202	274	568	1.119
SPECfp_rate95	349	437	751	714
LINPACK	935	1215	1265(1)	–
CPU cache	0.5 MB/1 MB on-chip primary			
RAM (max.)	4 GB			8 GB
Internal storage	36 GB		72 GB	
I/O slots	6 slots		8 slots	

J5000

The extreme compute and visualization workstation

Doubling the performance of the previous generation of J-Class systems, this next-generation HP-UX system offers two-way multiprocessing with high-performance PA-8500 processor running at 440 MHz. The J5000 supports a range of graphics subsystems from entry-level 2D and 3D to the ultimate in 3D visualization – the new HP VISUALIZE-fx^6 *Pro* subsystem.

The dual-processing J5000 delivers peak multiprocessor performance for the most demanding applications. It is well-suited for compute-intensive IC verification and simulation compute farms in electronics design, as well as advanced 3D design. It handles complicated computational analysis and compute- and memory-intensive processing workloads with ease.

J7000

Your ultimate design machine

NEW

The HP VISUALIZE J7000 Workstation is the ultimate design machine, offering big memory and extreme disk performance. Equipped with four of the industry's fastest processors, the 400-MHz PA-8500, and featuring largest RAM capacity and fastest data transfer on the market, the J7000 is designed to design in quick-time.

Supporting up to 8 GB of Synchronous DRAM, the J7000 gives you the memory capacity required for top performance on RAM-hungry applications. It works in conjunction with 2 GB/s I/O performance to break through today's design barriers. The J7000 is ideal for electronic or mechanical engineers handling large design, analysis and visualization problems. It's also an excellent solution for teams of engineers seeking faster data access in PDM applications.

Power
where you need it

From the entry-level A-Class and R-Class servers and the new L-Class to the high-end N-Class and V-Class servers, HP offers a full range of servers tuned for high-perform- ance and high-performance-density technical computing in MDA, EDA, Product Data Management and scientific computing. All featuring WebQoS and high-reliability functionality for mission-critical applications.
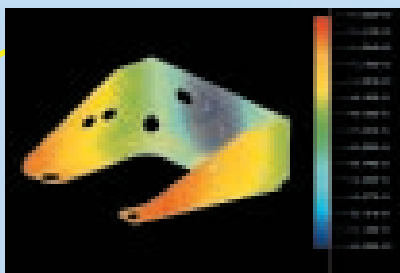
A-Class

Low-profile, low-cost rackmounts servers

HP A-Class Enterprise Servers provide a PA-RISC-based HP-UX solution at PC-like prices. Each A-Class system boasts up to 18-GB disk space and 2-GB RAM, with up to 20 A-Class servers fitting into one 2-meter cabinet for high performance density. With HP QoS and integrated Secure Web Console functionality, the A-Class also makes a great platform for Web-based solutions.

R-Class

Expandable SMP systems delivering industry-leading performance density

A high-value, high-power range of rackmount servers featuring up to two 180-MHz PA-8000 (R380) or 240-MHz PA-8200 (R390) processors. The R-Class features HP QoS and the Secure Web console to ensure maximum availability and minimum administration costs. Six systems will fit into a 2-meter cabinet – adding up to a massive 108 GB of storage and 18 GB of RAM – for industry-leading performance density.

L-Class

Entry-level High Availability workgroup server with PA-8500 performance

NEW

L-Class is a scalable workgroup server, ideal as a file server and/or PDM server (product data management) in technical markets. In the Electronic Design Automation (EDA) market, the L-Class is predestined for a role as a compute server.

Powered by one or two world-beating PA-8500 processors, the L-Class offers sizzling performance, N+1 redundant components, and high availability clustering solutions for technical computation, NFS file serving, product data management, and web hosting. The L-Class combines many of the advanced features of the N-Class midrange server (such as architectural scalability, performance density, and hardware compatibility with IA-64) with entry-level price the reliability of a UNIX operating system.

N-Class

Blazing performance, amazing price

The N4000 offers blazing performance at a size and price that let's you put it right where you need it. Giving you greater flexibility and faster response times. And greater control over your resources.

In the EDA market, the N4000 (440 MHz, 8-way) delivers over 2100 SPECint_rate95, a price/performance that is at least by a factor of 3 or 4 better than the nearest competitor. It also beats the competition by a factor 2 on cost for SPECfp_rate95 for MDA. And delivers OLTP performance of 2 and SPECWeb96 performance of 24,139 for PDM, and an estimated 30,000 SPEC SFS for NFS. And in scientific computing, the STREAM COPY benchmark is expected to be around 1800 MB/s for the 440-MHz, 8-way machine. The N4000 is the ideal server to put computing power where you need it.

V-Class

Technical Servers with the revolutionary PA-8200 processor

Powered by proven Exemplar supercomputer technology and the latest generation of powerful 64-bit PA-RISC processors, the V-Class has established itself as the clear pacesetter for data center and high-end compute server applications. The V2500 is powered by up to 32 world-beating 440 MHz PA-8500 processors makes it ideally suited for both high-end Enterprise applications (such as Data Warehousing, ERP and OLTP) and Technical Server applications. HP will soon offer Scalable Computing Architecture (SCA) allowing you to strap four V2500 machines together, providing the horsepower of 128 processors with one HP-UX 11.x operating environment.

HP VISUALIZE-*fx* graphics subsystems

HP VISUALIZE-*fx* Graphics subsystems put the world's leading visualization engines behind your 3D design work – on UNIX, Windows NT and Linux.

Full-scene anti-aliasing

Enhances image quality by eliminating jagged edges in the full scene, allowing for more accurate display of very small features. Particularly useful for industrial styling applications where surface detail is crucial to the design process.

Occlusion culling

Improves rendering performance by eliminating the drawing of hidden objects. Delivers up to twice the performance with visualization applications.

Hardware accumulation buffer

This advanced feature previously available only on UNIX graphics super-workstations provides soft shadows, motion blur, and image processing.

Hardware shadow casting

Creates photo-realistic shadows and allows object self-shadowing. Exclusively offered by HP for Windows-based workstations.

Optional texture mapping engine

Increases photo-realism, visual analysis, simulation and animation performance by extending function-ality of hardware shadow casting and hardware accumu-lation buffer.

HP Immersive Visualization Environments

Digital prototyping, simulation, outsourcing and multinational collaboration have resulted in growing demand for systems that allow engineers and scientists in the aerospace, automotive and related industries to immerse themselves in their data – as a group or individually, at one or more locations.

HP's Immersive Visualization Environments meet this need. They allow design teams to walk through an entire life-size virtual vehicle, airplane, building – or through a molecule. It also permits them to interact with the data, resolving design flaws in real time before a physical prototype is ever built.

HP VISUALIZE Center

The HP VISUALIZE Center is intended for auditorium scale briefings or group collaboration. Driven by three synchronized HP VISUALIZE J5000 workstations with performance-leading HP VISUALIZE-*fx Pro* graphics, this system provides wide-screen views on huge stereographic displays.
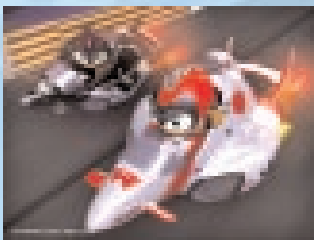
HP VISUALIZE Workgroup

HP VISUALIZE Workgroup is designed for small workgroups or for personal wide-screen presentation. It is driven by a single dual-pro-cessor HP VISUALIZE J5000 workstation with three VISUALIZE-*fx Pro* 3D graphics subsystems or three HP VISUALIZE 2D graphics cards.

Accessories

The right look and feel

Technical Computing is not only about number-crunching power. It's also about accessories that help you Make the best of your day. Like the HP Spaceball motion controllers and the HP 18.1" Flat Panel Display ...

Get a handle on design

HP Spaceballs do not replace your mouse. Providing motion in 6 degrees of freedom, it serves as the interface for moving and viewing 3D models. You simply push, pull or twist the Spaceball's Power-Sensor® ball for smooth and dynamic X, Y and Z axis rotations and translations. It's natural and intuitive – allowing you to concentrate on design, rather than on how to move the model.

Available in two versions, the HP Spaceball 3003FLX improves productivity by at least 25% and gives you greater freedom to fly through your design than with a conventional mouse or knob-box. You can also create custom functions, modify hard and soft button functions and create and select groups of functions. The HP Spaceball 4000FLX goes a step further, offering left- or right-hand operation, 12 buttons (5 finger, 3 thumb) and 10-bit internal resolution for increased precision in a Spaceball featuring industry-leading ergonomics.

For more information, please visit **www.hp.com/go/spaceball**

Looking good

When you spend a considerable part of the day looking at your screen, you deserve the best. The HP 18.1" Flat Panel Display offers a high-performance monitor in compact form.

Offering excellent brightness, contrast and viewing angle, the L1800 offers 1280x1024 image resolution and two ports for connection of one or two B1000, C3000, J5000, P-Class and X-Class workstations. Other features include auto setup, source switching, sleep mode, and desk-, wall- or arm-mounting. A USB port in the monitor stand allows connection of up to four compatible peripheral devices for expandability and multimedia options. The L1800 consumes up to 70% less energy, is TCO 99 certified, and meets all ergonomic and environmental norms.

For more information, please visit
www.hp.com/desktops/products/monitors/D5065A.html

Hold it in your hand

The HP Magellan SpaceMouse is the ultimate 3D motion-control accessory for HP VISUALIZE UNIX and NT Workstations. Used in addition to the 2D mouse, it gives users the impression that they are holding the model.

The HP Magellan SpaceMouse was developed for motion control of 3D graphic objects in design and visualization systems. The sensor cap allows simultaneous motion control of 3D models in all 6 degrees.

While the conventional mouse continues to control menus and functions, the SpaceMouse offers pressure-sensitive control of the model via a cap – users have the impression that they are holding the model in their hand.

Exhaustive testing in the automobile industry has demonstrated that the SpaceMouse not only leads to a time saving of some 25%, but also increases designer creativity while reducing fatigue.

SpaceMouse Plus

In addition to the SpaceMouse Classic there is a version called SpaceMouse Plus. The SpaceMouse Plus has several new features that make work even more intuitive and effective. These include a new user-friendly cap with a sculpted grip shaped for thumb, forefinger and middle finger. A soft, pressure-sensitive sensor detects virtually every cap movement. The V-shaped cap provides special support for the Zoom command, the most frequently used positioning command in 3D design.

Application support

The SpaceMouse is currently certified for over 70 applications.

Because the source code has been published, the SpaceMouse can be simply integrated into other applications.

For further information on the HP Magellan SpaceMouse, see **www.spacemouse.com**

For further information on applications and integration, see **www.spacemouse.com/software/**