

HP c8000 Workstation Product Overview

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Featuring

Processor

- 1-2 PA-8800 or PA-8900 dual-core processor modules:
- 2-way 900 MHz PA-8800 with 3 MB L1 cache
 - 2 or 4-way 900 MHz PA-8800 with 3 MB L1 cache and 32 MB L2 cache
 - 2 or 4-way 1 GHz PA-8800 with 3 MB L1 cache and 32 MB L2 cache
 - 2 or 4-way 1.1 GHz PA-8900 with 3 MB L1 cache and 64 MB L2 cache

Chipset

HP Scalable Processor Chipset zx1

Special features

Up to 32 GB PC2100 registered ECC DDR-266 (8 DIMM slots)

Mass storage expandability up to 1.2 TB max.

Integrated gigabit (10/100/1000) Ethernet

Range of 2D and 3D multi-display AGP 8X and PCI graphics

Six PCI slots

Five USB interfaces

Two serial ports

Whisper-quiet 4.2 bels sound output

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Executive summary

HP is proud to announce the next generation in 64-bit computing. The revolutionary HP c8000 Workstation brings 2-way and 4-way computing power to the desktop, supports the latest industry-leading AGP 8X graphics, and is binary compatible with existing, trusted HP-UX application environments. This low-cost, attractively designed workstation processes so quietly that you can integrate it seamlessly into the most formal office settings.

The HP c8000 is designed to address the most demanding technical workloads in automotive, aerospace and electronic design enterprises, with four times the processor and memory I/O bandwidth and 25 percent lower memory latency than previous generation PA-RISC workstations. Plus it's backed by HP's renowned stability, reliability and support. The HP c8000 Workstation sets the new standard for performance computing for MCAD, CAE, EDA, and OEM customers, and paves the way to make 2-way systems the new power desktop norm.

What's special about the HP c8000 Workstation?

The HP c8000 Workstation offers an impressive combination of features and benefits well-suited to today's technical computing environment:

- **High-end performance that's quiet enough for the office environment:** The quietest UNIX® workstation available, at just 4.2 bels, this unit is attractively design to make it a stylish and powerful addition to your desktop.
- **PA-8800 and PA-8900 dual-core processor modules:** Think fast and work faster with 2-way capability at a 1-way price and 4-way performance at a 2-way price. The latest 1.1 GHz 2-way or 4-way PA-8900 processor provides leadership performance for traditional UNIX customers.
- **High performance, low latency chip set optimized for 1- to 4- way systems:** The HP zx1 chipset, the same one used in HP Itanium workstations, enables greater-than-clock-rate scaling for technical workstation applications.
- **Industry standard AGP 8X graphics:** The latest ATI FireGL X3 graphics provides breakthrough performance at a fraction of the price of traditional UNIX graphics. You're no longer captive to antiquated, proprietary graphics cards that trail industry innovation.
- **Binary compatible with HP-UX 10.20, 11.0 and 11i applications:** The ability to run 32-bit and 64-bit applications from HP-UX 10.20, 11 and 11i workstations without change lets you use your current productivity applications while still taking advantage of the performance benefit of the latest technologies.
- **64-bit high memory capacity solution:** This workstation supports up to 32 GB of high-performance error checking and correcting (ECC) SDRAM and is designed to handle the largest workloads.
- **New low cost component alternatives:** Our new lower cost PA-8800 modules without the L2 cache, and low-cost IDE disks, makes multiprocessing throughput even more affordable.

HP c8000 Workstation customers

The HP c8000 Workstation offers customers the proven stability and reliability of HP-UX and PA-RISC, as well as a low-cost design with robust system administration tools that let a single administrator support thousands of workstations. These features, along with a broad product family that allows you to choose the right solution for your current and future environment, are applicable across a variety of industries. Below, we discuss the specific features that benefit targeted customer areas.

MCAD users

The HP c8000 Workstation offers MCAD users support for current robust application solution stacks, such as the CATIA V4 application that is widely used by automotive and aerospace customers. The 1.1 GHz PA-8900 with ATI X3 graphics provides industry-leading compute and visualization performance for CATIA V4 users. Enhanced performance enables more design alternatives with greater modeling detail.

The HP c8000's industry-leading AGP 8x graphics give MCAD users more creative freedom and the ability to look at more design variations in greater detail. This, combined with the 64-bit, large-memory footprint, allows the system to keep pace with thought processes and helps attain greater design insight and understanding by allowing users to navigate around models in real time. Users can visualize larger system assemblies with full detail and interactive performance without breaking up the design into smaller assemblies due to performance limitations.

CAE users

The HP c8000 Workstation allows CAE users to run both CAD and CAE applications on the same desktop. The high-performance system design of the PA-8800 and PA-8900 dual-core processors, high-bandwidth HP zx1 chipset, and AGP 8X graphics delivers the lowest cost, best price/performance and sheer performance combination in the industry. It also allows for quicker completion of more complex analyses, greater iterations, and higher-quality designs. It has some particularly compelling features for RISC CAE power users:

- Only RISC workstation to offer 2-way and 4-way desktop computing: This enables excellent throughput and performance on multi-threaded CAE applications using dual-core RISC processors
- Only RISC workstation with largest 32 GB of memory: 2x the capability of closest competitors, enabling engineers to compute and visualize large simulations at their desks.
- Latest high-end 3D graphics: Display complex animations and 3D models in real-time with the ATI FireGL X3 and its 256 MB of video memory
- Low latency 8.5 GB/s memory bandwidth: High bandwidth fast data transfer between memory and processors.
- Four high-performance disk drive bays: Allows the room lets you stripe the disks for greater performance, and grow and configure the system as needed.

The HP c8000 boasts a 2- or 4-way local compute resource for power users and the highest performance possible from any vendor that can run both CAE and CAD application environments. The 64-bit, large-memory footprint can process large models and more accurate analysis. Four expandable disk drive bays let you stripe the disks for greater performance, and grow and configure the system as needed.

EDA users

The HP zx1 chipset improves memory-intensive applications with greater than clock rate performance scaling on EDA applications, thanks to low latencies and PA-8900 performance. The chipset allows higher performance and system throughput in a cost-optimized design, so you don't pay for server functions that detract from the performance of technical applications. The dual-core PA-8900

processor boosts productivity with a faster turnaround and throughput on simulation jobs allowing engineers to optimize their designs. The 64-bit, 32 GB large-memory footprint allows customers to improve product performance and quality by allowing them to simulate complete designs rather than breaking them up into smaller components to fit within the physical constraints of a 32-bit system. Two and four-way processing capabilities enables more system throughput, allowing customers to simulate more designs and improve product quality and performance.

OEM users

The HP c8000 has much to offer OEM embedded systems customers in the defense, telecommunications, and manufacturing process control industries. This unit provides a fixed, stable, and reliable platform that will support OEM activities for years to come. The advantages of the unit itself are bolstered by the HP commitment to provide a fixed form factor and continual infrastructure upgrades of commodity and processor technology. With this workstation, OEM customers can deploy once and then service and update over time.

HP c8000 Workstation specifications

Operating systems options:	HP-UX 11i Version 1 TCOE (Technical Computing Operating Environment) HP-UX 11i Version 1 MTOE (Minimal Technical Operating Environment)	
Processor(s):	1-2 PA-8800 or PA-8900 dual-core processor modules: <ul style="list-style-type: none"> • 2-way 900 MHz PA-8800 with 3 MB L1 cache • 2 or 4-way 900 MHz PA-8800 with 3 MB L1 cache and 32 MB L2 cache • 2 or 4-way 1 GHz PA-8800 with 3 MB L1 cache and 32 MB L2 cache • 2 or 4-way 1.1 GHz PA-8900 with 3 MB L1 cache and 64 MB L2 cache 	
Max. of processors:	4 (using two 2-way PA-8800 or PA-8900 processor modules; 2-way standard, 4-way optional)	
Chipset:	HP Scalable Processor Chipset zx1	
Chipset bus performance:	6.4 GB/s effective processor bandwidth, a maximum of 8.6 GB/s memory bandwidth and 80 ns memory access latency, 3.5 GB/s I/O bandwidth; Independent internal data paths for sustained peak performance	
Memory:	Up to 32 GB of PC2100 registered ECC DDR-266 (8 DIMM slots)	
Expansion bays:	4 internal 3.5 inch HDD bays, 3 externally accessible 5.25-inch bays	
Drive controllers:	Integrated Ultra320 SCSI controller	
Hard drive(s):	Up to 4 SCSI drives, 1.2 TB max.; 73, 146, 300 GB (10K rpm), 73 GB (15K rpm) Ultra 320 SCSI drives Up to 2 IDE drives, 80 GB max.; 40 GB (7200 rpm) UltraATA drives	
Removable media:	CD-RW, DVD-ROM, DVD+RW (up to 3 with SCSI disks)	
Expansion slots:	1 AGP-8X pro slot, (150 watts maximum power including auxiliary power connector), 6 PCI slots: 4 full-length (1 64-bit/133 MHz PCI-X, 2 64-bit/66 MHz PCI-X, 1 64-bit/33 MHz PCI); 2 half-length (32-bit/33 MHz PCI)	
Graphics:	Professional 2D:	HP fxe (1 display per card, max. 4)
	Entry-level 3D:	ATI FireGL T2 (dual display capable)
	Mid-range 3D:	ATI FireGL X1 (dual display capable)
	High-end 3D:	ATI FireGL X3 (dual display capable)
Audio:	Optional 16-bit stereo full-duplex - uses half-length slot	
I/O ports and connectors:	5 USB 2.0 ports (2 front, 3 rear), 2 9-pin DIN serial (rear), 1 RJ-45 port (rear).	
Networking/communications:	Integrated 10/100/1000 Mbps Base-T Ethernet	
Power:	650 watts maximum output	

Acoustic properties:	4.2 bels idle; 5.0 bels maximum operating; ISO 9296 Declared sound power levels
Input device:	USB keyboard; 2-button USB 3-button optical mouse (scroll mouse optional)
Dimensions (h x w x d):	Tower configuration: 49 cm (19.3 inch) x 28.7 cm (11.3 inch) x 57.2 cm (22.5 inch) Rackable configuration: 20.3 cm (8 inch) x 42.4 cm (16.7 inch) x 57.2 cm (22.5 inch)
Weight:	Minimum and maximum tower configuration: 22.5 kg (49.5 lb.) to 28.3 kg (62.5 lb.) Minimum and maximum rack configuration: 21.9 kg (48.3 lb.) to 27.8 kg (61.3 lb.)
Monitors:	HP L1955 19 inch flat panel, HP L2035 20 inch flat panel, L2335 23 inch flat panel
Warranty:	1 year parts, labor, and next-day on-site service, upgrades available to same-day service; 8am – 5pm telephone support; terms and conditions may vary, certain restrictions apply

How the HP c8000 fits into the HP workstation family

HP has a broad workstation product family that lets you can choose the right solution for your current and future environment, without worrying about proprietary lock-in.

The current line of PA-RISC workstations includes uni- and dual-processor RISC-based UNIX workstations that deliver leading graphics performance, expandability, and value. These products will continue to be offered to HP customers who value the stability and form factor of the current models. The HP c8000 Workstation marks the launch of the next generation of HP workstations and is ideally suited to customers who want the latest performance capabilities and technologies while remaining binary compatible with their current infrastructure.

HP workstation products run the gamut of personal UNIX, Microsoft® Windows®, and Linux® workstations. HP has spent over a decade designing tools, infrastructure, and applications around the UNIX environments. When you need a trusted UNIX solution that can accelerate your current environment while providing a bridge to future Microsoft Windows and/or Linux 64-bit technologies, HP has your workstation.

HP c8000 Workstation advantages

The HP c8000 Workstation opens new horizons by delivering maximum performance at a lower cost. It is the highest HP performance workstation that runs the full suite of UNIX applications that are part of the customer core design process. This section provides more detail on some of the special technology features provided by the HP c8000 Workstation.

Attractive styling and quiet design

The HP c8000 Workstation has a low-noise design that is especially well-suited for office environments. The form factor was designed with a specific focus on packaging airflow to reduce the noise level. Customers demanded a more acoustically pleasing workstation and the HP c8000 delivers. Emitting just 4.2 bels, it is whisper quiet - and like a whisper, this product is significantly quieter than other RISC competitor products, which run at a sound level more equivalent to heavy rain. The near-silent output of the HP c8000 Workstation offers a more aesthetic and productive work environment so you can concentrate on complex tasks without the distraction or disruption of a noisy deskside unit.

PA-8800 and PA-8900 dual-core processor modules

The 4-way 1.1 GHz PA-8900 sets a new standard for UNIX RISC workstations, giving you the performance and throughput you need to tackle your toughest workloads.

The PA-8900 processor increases the dual core processor frequency to 1.1 GHz, doubles the size of the L2 cache to 64 MB, and increases the speed of the cache by 50%. The result is greater-than-clock-rate performance scaling on CAD, CAE, and EDA applications. Typical performance increases for these applications are up to 20% higher than the previous 1 GHz PA-8800 processor. The PA-8900 has also been pre-enabled to drive your existing application environment. The application suite and HP-UX 11i operating system release that you may have already certified for your HP c8000 workstations is pre-enabled to run the PA-8900; no application or operating system change required. A simple processor module and firmware upgrade is all that is required to take advantage of the performance benefits of the PA-8900 processor.

The PA-RISC core and tried and tested HP-UX combination makes application compatibility straightforward. No special software is required to take advantage of the dual-core design.

HP Scalable Processor Chipset zx1

The HP Scalable Processor Chipset zx1 is one of the most flexible chipsets ever developed—designed specifically for 1-4 way processing, allowing it to be high performance and low-latency. It is ideal for performance and throughput applications for technical workstations. Below are the features, benefits, and business advantages of the chipset.

Table 2: HP Scalable Processor Chipset zx1

Feature	Benefit	Business advantage
6.4 GB/s front side bus bandwidth	Peak transfer rate equivalent to 1.4 DVDs every second, providing two parallel performing processors with access to needed data immediately. Higher sustained throughput translates into better overall system performance and more-efficient code execution.	Provides faster data solutions for better time-to-market, shorter simulation run times, and quicker modeling functions. Allows you to run larger data sets and models with less wait time.
Optimized chipset prefetch	Hardware prefetch capability significantly reduces latency. The chipset can determine whether prefetching is appropriate, and then automatically prefetch to speed access to data that the processor may need. This chipset is better balanced than most workstation chipsets because it offers lower latency, higher bandwidth transfers, and dedicated I/O buses.	Helps ensure faster time-to-resolution and greater productivity for each unit. Even in situations where chipset prefetch is not appropriate, the underlying design is efficient enough to ensure excellent performance and greater business efficiency.
Supports up to 32 GB of directly addressable DDR-266 memory	Very large memory configurations can be achieved and directly addressed by the processor. Single processes larger than 3 GB can be contained within the memory for faster access, and the processor can operate on the whole set. 8 DIMM slots provide headroom to achieve high-density memory configurations at a lower cost by filling more slots with lower-density, less-expensive DIMMs (using 512 MB memory sticks allow you to add 4 GB at a low price).	Business or research establishments can do work that was previously operating environment- or cost-prohibitive, such as multi-million-part models or very large simulations. If cost is a significant factor, the large number of memory slots allows less-expensive memory configurations that still break the 3 GB barrier, and can be applied to commodity operating systems. The use of industry-standard DDR memory ensures that your return on investment will benefit from excellent price/performance.
AGP 8X supported	Enables support of industry-leading graphics cards to achieve strong performance at low cost	Enables customers to visualize designs in real-time

Leading graphics technology

The HP c8000 Workstation supports the AGP 8X chipset, which allows the latest, highest-performing graphics in the industry to run on PA-RISC workstations. HP offers a complete line of graphics choices, from professional 2D to high-end 3D, providing the power you need for mechanical design, analysis, and accurate 2D imagery.

- **HP fxe:** A capable 2D and basic 3D card, the HP fxe offers hardware acceleration for OpenGL and HP's legacy graphics languages. It features 48 image planes for double buffered, true color, 3.5 MB of hardware accelerated texture mapping, and a maximum resolution of 1280x1024 double buffered, 1600x1200 single buffered per display. It is able to support 4 monitor configurations with multiple fxe cards, with HP's single logical screen giving resolutions to 6400x1200.
- **ATI FireGL T2:** Offering OpenGL hardware acceleration, two parallel geometry engines, four parallel pixel pipelines, 128 MB of unified frame buffer and texture storage, 128-bit full floating point precision and high-speed memory interface using DDR memory, this board supports dual displays (one DVI-I and one VGA connector) plus full 24-bit, true color graphics at resolutions up to 1920 x 1200 per display.
- **ATI FireGL X3:** Designed for the highest-end CAD users who work the largest models and may also require high-detail real-time rendering performance, this board features 12-pixel pipeline architecture providing high performance, parallel rendering capabilities, OpenGL hardware acceleration, six parallel geometry engines, and twelve parallel pixel pipelines. It also supports a large high speed 256 MB shared GDDR-3 memory for texture intensive models that need high visual quality using 4X full scene anti-aliasing or for immersive visual reality support. This board supports dual displays using two DVI-I outputs, 32-bits per RGBA component displays beyond 16.7M colors and resolution up to 3840 x 1200 using 2 digital displays.

Return on investment

The HP c8000 Workstation offers an impressive mix of price and performance that is unmatched. The true 64-bit scalability and performance of the HP zx1 chipset on this workstation gives enterprise users the power needed to directly address 32 GB of memory. This allows you to create larger models than on 32-bit platforms—a huge productivity boost for engineers who currently work around the memory limits of today's 32-bit workstations. Data sets that were beyond the capabilities of older architectures are now feasible, and simulations that would have taxed a 32-bit or older RISC system can achieve multiple runs in the time it once took to perform a single iteration.

In addition to significant productivity boosts, the HP c8000 protects your investments in data, applications, and expertise in providing plug and play compatibility with your existing infrastructure. The HP c8000 workstation is an extraordinarily economical powerhouse that stands the test of time in your environment. The use of industry-standard, components such as IDE and SCSI disk drives, off-the-shelf graphics, standard memory, and standard optical drives, as well as robust administration and support tools, helps maximize performance while reducing the cost of your IT investment.

Excellent lifecycle value

The HP c8000 Workstation is a rock-solid solution that you can rely on for years to come. This long-lifecycle product offers a mature processor and operating system environment that has provided consistent binary compatibility since 1996. The workstation is expandable with up to 584 GB of SCSI storage. You can choose from four internal Ultra320 drives using either the high-speed and high-capacity 10,000 rpm SCSI interface (with up to 146 GB storage per drive) or the extreme performance 15,000 rpm SCSI interface (with up to 73 GB storage per drive). Robust expansion capabilities, including two processor sockets and four disk drive bays, let you grow and configure the system as needed. The HP c8000 supports either deskside or rack kits that allow it to be used as a personal resource or deployed into a high-performance compute cluster.

Strong binary compatibility and parallelism

The HP c8000 workstation is binary-compatible with HP-UX 10.20, 11.0, and 11i applications, so there's no need to upgrade your application infrastructure. HP maintains binary compatibility between PA-RISC processors and between versions of HP-UX. The HP c8000 Workstation's strong backward compatibility with 32 bit and 64-bit HP-UX binaries helps reduce costs, since less time and resources are required for porting, redevelopment, data migration, software replacement, and IT integration costs.

Service and support

The HP c8000 Workstation comes with a one-year warranty against defects in materials and workmanship, which includes one-year phone-in hardware support where available, one-year parts, one-year labor, and one-year of onsite response. The system processor unit, keyboard, mouse, and HP accessories inside the system processor unit—such as video adapters, mass storage devices, and interface controllers—are covered by this warranty.

HP workstation products external to the system processor unit, such as external storage subsystems, displays, printers, and other peripherals, are covered by the applicable warranties for those products. HP software is covered by the HP Software Product Limited Warranty (see www.hp.com for details).

Phone-in support is available during the warranty period, starting from date of purchase. Also included is basic technical phone-in assistance with the configuration and setup of the HP workstation and the pre-loaded operating system.

Warranty terms may vary by country. Authorized HP dealers or any HP sales and service office can provide details. To obtain phone-in assistance or onsite service during the warranty period, contact an HP Sales and Service Office.

Worldwide, refer to: www.hp.com/cpsso-support/guide/psd/expectations.html.

In the United States and Canada, call the HP Customer Support Center at (970) 635-1000 or a participating Authorized HP Personal Computer Dealer Repair Center.

Conclusion

The HP c8000 Workstation is designed to address the most demanding technical workloads in automotive, aerospace, and electronic design enterprises. Quadrupling graphics, processor and memory I/O bandwidth and offering 25 percent lower memory latency than previous generation PA-RISC workstations, the HP c8000 offers leadership performance for traditional UNIX applications.

Backward compatibility built into the hardware and operating system ensures parallelism with your current environment. Industry-leading graphics performance, a large 32 GB memory footprint, and a new whisper-quiet form factor round out the package. This is a workstation with the best price/performance and performance in its class, backed by HP stability, reliability, and support in over 160 countries around the world. The next generation of extreme UNIX power has arrived.

For more information

For more information about HP workstations or solutions, and related technologies, visit the following locations online:

HP home page	www.hp.com
HP workstations	www.hp.com/workstations
HP Leadership Graphics Program	www.hp.com/go/leadershipgraphicsprogram
DCC market information	www.hp.com/technicalsolutions/dcc/index.html
MCAD/CAE market information	www.hp.com/technicalsolutions/pdd/mcad/solutions.html
ATI	www.ati.com
Enterprise Business Center	welcome.hp.com/country/us/eng/solutions/business.html
Small and Medium Business Center	welcome.hp.com/country/us/eng/solutions/smb.html
HP support	thenew.hp.com/country/us/eng/support.html

To learn more, visit www.hp.com/workstations

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