

HP AND BENTLEY

Give yourself a design edge



Architects, engineers, and designers gain an unprecedented step in performance and productivity thanks to the HP and Bentley edge, which helps ensure optimum compatibility when running industry-leading CAD software on the new line of HP Z Workstations. When using HP Workstations and software from Bentley Systems, Incorporated®, you benefit from the HP commitment to innovation and solutions excellence combined with the strength of the HP and Bentley relationship.

HP innovation, performance, reliability, relationships and personal productivity

HP Z Workstations are engineered to optimize the way hardware and software components work together, delivering massive, whole-system computational power that helps maximize your productivity and make 2D and 3D design and visualization faster and more efficient than ever before. This gives you an edge in five key areas:

- **Innovation:** Next-generation technology, including a new line of 2D and 3D graphics cards, help create and visualize even the most complex designs. HP WattSaver, when activated, helps lower energy consumption.
- **Performance:** Advanced compute and visualization power help speed your work, beat deadlines, and meet expectations. At the heart of HP Z Workstations are the new Intel® Xeon® processors with advanced processor performance technologies, such as Intel® QuickPath, Intel® Hyper-Threading¹² and Intel® Turbo Boost. Intel® Turbo Boost¹³ is

designed to enhance the base operating frequency of processor cores, providing more processing speed for single and multi-threaded applications. The HP Z Workstation cooling design enhances this performance.

- **Reliability:** HP product testing includes application performance, graphics and comprehensive ISV certification for maximum productivity. You can be confident in your HP and Bentley solution.
- **Relationships:** HP resources and our relationships with Bentley, graphics vendors, chip suppliers and Microsoft provide a consistent application, operating system, hardware and graphics technical direction. This results in broader, more dependable 3D application oriented technology choices.
- **Personal productivity:** Only HP provides unique tools to improve workstation user productivity, including: HP Performance Tuning Framework, a workstation optimization tool; HP Remote Graphics Software, a high performance real-time 3D screen sharing application; and HP SkyRoom, a day-to-day collaboration tool.

The HP and Bentley Edge

The unique relationship between HP and Bentley brings you a comprehensive portfolio of solutions running on innovative hardware and software that is tuned and integrated for top performance. Our close relationship and engineering expertise help ensure solutions that perform not only today, but for the long run.

“Our relationship with HP provides many benefits to our users. We work closely with the HP development teams to test HP Workstations to ensure optimal performance and compatibility with our software. HP workstations also offer users superior rendering and 3D graphics capabilities.”

Chris Barron,
Vice President,
Bentley Systems, Inc.

HP and Bentley—Working Together

- HP thoroughly tests and certifies each HP Personal Workstation for more CAD applications than anyone else.
- HP submits workstations and professional graphics cards to Bentley for application testing. You can be confident in the quality of your HP Workstation and Bentley solution.
- Bentley uses HP Workstations internally to develop and test its software.
- HP Remote Graphics Software enables users to share 3D screen images with remote users, as well as access their own workstations, remotely.
- HP Performance Tuning Framework has special features to optimize the performance of Bentley software.
- HP has experts who work with Bentley technical resources and are available to support customers and recommend configurations.
- HP SkyRoom allows day-to-day real-time visual collaboration between MicroStation users.

Bentley is the global leader dedicated to providing comprehensive software solutions for sustaining infrastructure. Bentley has proven applications that help engineers, architects, contractors and governments, utilities and owner-operators design, build and operate more productively, and deliver infrastructure assets that perform more sustainably. With revenues surpassing over \$500 million annually, and over 2700 colleagues globally, Bentley is a leading provider of AEC software to top design firms, owner-operators and the GIS/geospatial market.

Innovate with MicroStation®

MicroStation is a proven CAD platform with fully integrated 2D and 3D workflows, used by teams of architects, engineers, owner-operators, constructors and GIS professionals who share a common mission to deliver better projects. With an integrated suite of easy to use and versatile capabilities, MicroStation helps teams improve the way they design, model, visualize, document, and map projects of all shapes and sizes.

Key innovations in MicroStation integrate Bentley's comprehensive software portfolio of solutions to deliver interoperability, power, accessibility and photo-realistic visualization to every user. MicroStation has become a standard among the design elite of the ENR Global 150.

Collaborate with ProjectWise®

ProjectWise® collaboration software connects people and information across project teams—no matter where they are located—to help them improve quality, reduce rework, and meet project deadlines.

When connected through ProjectWise, coordinated design teams can efficiently manage, find, share,

publish and review CAD and geospatial content, project data and Microsoft® Office documents. The ProjectWise collaboration system includes desktop and server software for content management, content publishing, and design review. It uniquely addresses the project needs of all connected stakeholders to deliver average annual employee savings of 13 percent and firm-wide ROI of between 10 and 40 times the initial ProjectWise investment.

With results like these, it's no surprise that all 50 of the 50 leading organizations in the ENR Top 500 are now connected by ProjectWise.

Bentley Solutions Offerings

Bentley delivers solutions for the entire lifecycle of the infrastructure asset, tailored to the needs of the various professions—the engineers, architects, planners, contractors, fabricators, IT managers, operators and maintenance engineers—who will work on and work with that asset over its lifetime. Comprised of integrated applications and services built on an open platform, each solution is designed to ensure that information flows between workflow processes and project team members to enable interoperability and collaboration.

Bentley's broad range of solutions are each designed around specific infrastructure types:

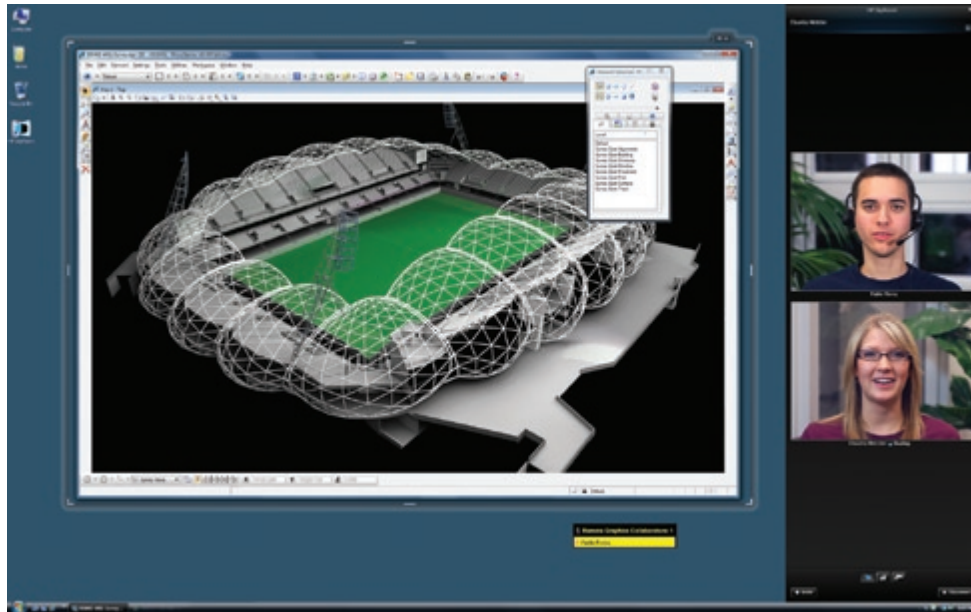
- Oil and gas
- Metals and mining
- Power generation
- Industrial facilities
- Cadastre and land development
- Buildings
- Campuses
- Rail and transit
- Communications
- Roads
- Bridges
- Water and wastewater

Bentley Visualization for HP Workstations

Bentley's MicroStation licenses Luxology, a super-fast rendering engine, to produce high quality images from huge datasets that generate life-like detail within AEC workflows. World-class photorealistic rendering has finally become a readily accessible tool for virtually every AEC practitioner and project, empowering design teams to:

- Immediately visualize and further refine potential designs to provide better-performing infrastructure
- More easily secure stakeholder buy-in on concept and final design work with high-impact presentations as a routine by-product of their work.

Luxology in MicroStation creates high-quality renderings that include global illumination, increased depth, undeniably real and physically-based shading models.



Improve your day-to-day productivity with real-time video collaboration using HP SkyRoom

Your digital workbench

In addition to leading-edge hardware solutions, HP and Bentley together offer a combination of applications, workstations and personal productivity tools that combine to provide a complete digital workbench that saves you time. In addition to the HP Z workstation, HP's key contributions to the digital workbench are:

- HP SkyRoom
- HP Remote Graphics Software
- HP Performance Tuning Framework
- HP SpacePilot
- HP Support Assistant

HP SkyRoom

HP SkyRoom is the next-generation remote conferencing tool. It allows up to four individuals to communicate in their own personal meeting space within the corporate network. HP SkyRoom offers the following advantages:

- **Instant collaboration:** Live audio, video, application sharing, and streaming video allow for a face-to-face meeting experience with your colleagues.
- **Professional quality:** HP SkyRoom's high-resolution capabilities, embedded media engines, and AES256 advanced encryption help ensure a high-quality, secure video conference environment. You can even connect via a VPN when outside your corporate network.
- **Affordable simplicity:** HP SkyRoom is an affordable, easy-to-use solution that will help to minimize travel costs and foster teamwork and collaboration throughout your company or organization.

HP Remote Graphics Software

HP Remote Graphics Software (RGS) is an advanced 3D screen-sharing utility that allows remote access and workstation sharing. Using HP compression technology, HP RGS compresses the screen image and sends it to receiver software for decompression and display. The receiver captures keystrokes and mouse clicks for return to the workstation. HP RGS minimizes network usage and enables remote access without compromising performance or image quality. For engineers and designers looking to speed the design process, HP RGS enables real-time sharing of high-resolution imagery so creative teams from multiple remote sites can collaborate instantly, regardless of remote distances. For more information see the HP Remote Graphics Software Users Guide at www.hp.com/go/rgs

HP Performance Tuning Framework

Put the underlying power of HP Workstations at your fingertips, with a powerful interface to analyze, fine-tune, and optimize the performance of HP Workstations. HP Performance Tuning Framework (PTF) makes it easy to keep your professional applications running smoothly by:

- Providing a detailed configuration report so you can easily see what's on your system.
- Organizing graphics driver certification information to help you make informed decisions when loading the latest drivers.
- Tracking memory use and graphically displaying how applications and processes use physical and virtual memory.
- Monitoring system resource usage over time to identify bottlenecks.

- Measuring subsystem performance and reporting in an easy to understand chart.

If problems arise, Bentley support staff can review your HP PTF configuration report. This report can be generated easily by clicking on the configuration tab and saving the file. For more information see www.hp.com/go/framework

HP SpacePilot

SpacePilot Intelligent Controller enables two-handed CAD, with one hand on the mouse and one on the HP SpacePilot. This device combines:

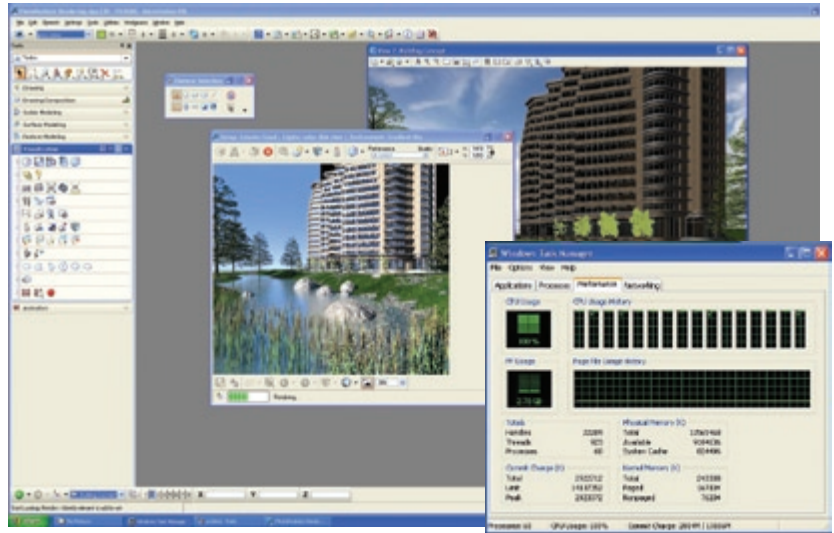
- Refined sensing technology that allows you to intuitively push, tilt, or twist the control cap for an immediate on-screen response.
- Extendable function keys that can be programmed to simplify repeat operations or multilayered menu pull downs for increased efficiency.
- Comfortable design that minimizes repetitive stress.

Studies show significant improvements in user productivity when inputting with an HP SpacePilot.

HP Support Assistant

HP Support Assistant makes it easier than ever to own and use an HP Workstation. It comes preinstalled on every workstation with latest version of Windows Vista® or Windows® 7. HP Support Assistant provides you with the following support features:

- **Maintain:** Automated software updates and reminders, maintenance routines, and other preventative measures help you keep your HP Workstation in peak condition.



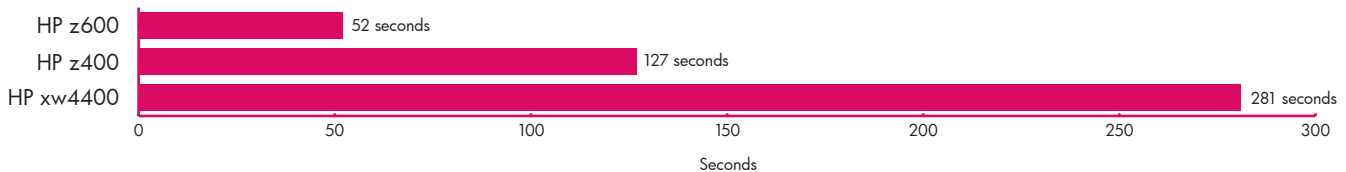
Rendering performance improves with the HP Z Workstation multi-core/multi-processor architecture

- **Troubleshoot:** Diagnostic utilities help you investigate problems on your own and find solutions for common issues.
- **Learn:** An extensive library, including specification and warranty information and online resources, helps you make the most of your HP Workstation.
- **Get assistance:** Friendly and efficient experts are available to assist you with problems you can't solve on your own. Remote access capabilities allow the HP agent to investigate the problem directly, adjust your system setting and even install software patches and upgrades.

HP Support Assistant, part of HP Total Care Service and Support, saves you valuable time and allows you to get the most out of your HP Workstation.

HP Z Workstations - a leap in performance

MicroStation v8i Rendering Performance*



HP xw4400 NVIDIA Quadro FX 1500 2.67 GHz DC
Intel Xeon E6700
HP Z400 NVIDIA Quadro FX 1800 3.2 GHz
HP Z600 NVIDIA Quadro FX 1800 2 x 2.93 GHz

*Testing done by Bentley Visualization Lab



Meet the HP Workstation family

Combining bold design, best-in-class engineering, robust tools, and visual collaboration solutions, the HP Workstation family takes innovation, performance, and reliability to the next level—to give you and your business or engineering function a design edge. All HP Workstations are tested and certified for Bentley applications. HP tests a comprehensive range of applications on our workstations, helping ensure reliable, dependable performance.

HP Z400 Workstation

The HP Z400 Workstation delivers enhanced workstation performance in an affordable package to transform how engineering and design professionals work. The next-generation system architecture enables fast and efficient performance plus HP personal productivity tools and built-in HP reliability that help you work more productively and get the job done faster. This workstation is ideal for users of Bentley software who need the most affordable solution.

HP Z600 Workstation

The HP Z600 Workstation packs compute and visualization power to help you work faster and beat deadlines—delivering maximum performance in our smallest, quietest dual eight-core design when every inch, watt and decibel make a difference. This workstation is ideal for 3D users who want to take advantage of the multiple cores needed for applications that use rendering, animation and simulation. This system's dual-processor capability, combined with Intel Turbo Boost and Hyper-Threading technologies, is well-suited for users of single-threaded applications who occasionally need support for multi-

threaded applications, such as Bentley visualization and luxology features.

HP Z800 Workstation

The HP Z800 Workstation delivers the ultimate performance in a revolutionary next-generation design that combines extreme speed, massive expandability and maximum productivity to accelerate even the biggest, most complex engineering and design projects. This high-end workstation provides the expandability, performance, and data storage required by power users of Bentley and other MCAD and CAE applications.

HP xw9400 Workstation

The HP xw9400 Workstation delivers uncompromising graphics performance and maximum expandability, combining computing and visual power with I/O performance, while helping to lower your total cost of ownership. This workstation is ideal for high-end Bentley power users who want the AMD advantage.

HP Elitebook 8730w Mobile Workstation

The HP Elitebook 8730w Mobile Workstation redefines power on the move, combining the best in visualization and computational power with a 17-inch diagonal display for HP's highest performing mobile workstation. This mobile workstation offers reinforced latches and durable construction in a lightweight form factor that has passed most Mil-Std-810F testing, making it a great tool for professionals on the go. The choice of an HP DreamColor screen enables true color visualization and top performance for Bentley applications. This notebook is designed to be more rugged for those whose work needs to be mobile.



Cadalyt Labs awarded the HP Z600 Workstation a prestigious Highly Recommended Thumbs Up Award giving it a rare A+ grade. In their words "a testament to the leap in processing technology brought about by this new generation of hardware" and "it's innovative design and superb engineering and is forward looking in terms of expansion. The attention to detail in this system is remarkable, as is the design philosophy". Learn more at:

<http://www.cadalyt.com/hardware/news/hp-z600-workstation-first-look-review-8130>

Meet the HP Workstation family

Model	HP xw4600 Workstation	HP Z400 Workstation	HP Z600 Workstation	HP Z800 Workstation	HP Elitebook 8730w Mobile Workstation
User	Ideal for entry level users where workstation performance is needed	Ideal for those who want to maximize performance with single threaded application	Ideal for those who occasionally need multi-core performance	Ideal for those who have the largest files, store large data sets	Ideal for those who want the most power a notebook can provide, as light as possible
Bentley solution	MicroStation Entry level users	MicroStation users with some visualization, also users of GeoPAK, InRoads	MicroStation user with significant visualization	MicroStation Power user	All Bentley applications
Processors ^{1,2}	Intel® Pentium® Intel Core™ 2 Duo processor Intel Core 2 Quad processor Intel Core 2 Extreme processor	Dual- and quad-core Intel® Xeon® processor Intel® QuickPath Technology	Quad-core Intel Xeon processor Intel QuickPath Technology	Quad-core Intel Xeon processor Intel QuickPath Technology	Intel Core 2 Duo or Extreme processor
Graphics cards	ATI FireGL V5600 ATI FireGL V7700 NVIDIA Quadro FX 370 NVIDIA Quadro FX 570 NVIDIA Quadro FX 1700 NVIDIA Quadro FX 3700 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4600 NVIDIA Quadro FX 4800	NVIDIA Quadro FX 380 ATI FirePro V3700 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 ATI FirePro V5700 ATI FirePro V7750 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800	NVIDIA Quadro FX 380 ATI FirePro V3700 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 ATI FirePro V5700 ATI FirePro V7750 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800	NVIDIA Quadro FX 380 ATI FirePro V3700 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 ATI FirePro V5700 ATI FirePro V7750 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800 NVIDIA Quadro FX 5800	NVIDIA Quadro FX 3700M NVIDIA Quadro FX 2700M ATI Mobility FireGL V5725

Suggested configurations

(ALL APPLICATIONS CERTIFIED)

www.hp.com/go/workstationfinder

HP Recommended Configurations for

Bentley MicroStation® standard user



HP xw4600 Workstation

Genuine Windows® XP Professional 32-bit available through downgrade rights from Windows Vista® Business*,**
Intel® Core™2 Duo E8400^{1,2,4} processor (3.00 GHz, 6 MB L2 cache, 1333 MHz FSB)
Intel X38 Express chipset
4 GB DDR2 800 MHz ECC^{5,6}
NVIDIA Quadro FX 570
250 GB SATA⁸
DVD-ROM SATA⁹
HP LP2475w 24-inch Widescreen LCD Monitor
HP Remote Graphics Software
HP Performance Tuning Framework
HP SkyRoom Video Conferencing
HP SpacePilot
HP Scroll Mouse
Application certified
3/3/3 limited warranty

Bentley MicroStation® advanced user



HP Z400 Workstation

Genuine Windows XP Professional 64-bit available through downgrade rights from Windows Vista Business*,**
Intel® Xeon® Quad-Core¹ W3570⁴ processor^{1,2,4} (3.20 GHz)
Intel X58 Express chipset
6 GB DDR3 ECC memory^{5,7}
NVIDIA Quadro FX 1800
320 GB 10k rpm SATA⁸
DVD-ROM SATA⁹
HP LP2475w 24-inch Widescreen LCD Monitor
HP Remote Graphics Software
HP Performance Tuning Framework
HP SkyRoom Video Conferencing
HP SpacePilot
HP Scroll Mouse
Application certified
3/3/3 limited warranty

Bentley MicroStation® power user



HP Z600 Workstation

Genuine Windows XP Professional 64-bit available through downgrade rights from Windows Vista Business*,**
Two Intel Xeon Quad-Core¹ X5570⁴ processor^{1,2,4} (2.93 GHz)
6 GB DDR3 ECC memory or 8 GB if 64-bit^{5,7}
NVIDIA Quadro FX 3800 (1 GB Video RAM) (2) 300 GB 15k rpm SAS⁸
DVD-ROM SATA⁹
HP LP2475w 24-inch Widescreen LCD Monitor
HP Remote Graphics Software
HP Performance Tuning Framework
HP SkyRoom Video Conferencing
HP SpacePilot
HP Scroll Mouse
Application certified
3/3/3 limited warranty

All Bentley applications



HP Elitebook 8730w Mobile Workstation

Genuine Windows XP Professional 64-bit available through downgrade rights from Windows Vista Business*,**
Intel Core™ 2 Duo processor^{1,2,4} T9800⁴ 2.93 GHz, 6 MB L2 cache
1066 MHz FSB
17-inch diagonal WUXGA display (1920 x 1200)
NVIDIA Quadro FX 3700m with 1 GB of video memory
8 GB DDR2 800 MHz SDRAM memory^{5,6}
320 GB 7200 rpm SATA hard drive⁸
DVD/CD RW Combo⁹
7.5 pounds¹¹
Business rugged design
HP Remote Graphics Software
HP Performance Tuning Framework
Application certified
3/3/3 limited warranty

Windows®. Life without Walls™. HP recommends Windows.

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www.hp.com/go/store

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By phone: 1-800-888-0262
8am - 9pm ET (5am - 6pm PT) Monday - Friday
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Geneva, Switzerland

EMEA workstation country homepages

www.hp.com/eur/workstations

For more information about HP and Bentley solutions,
please visit www.hp.com/go/Bentley

Screenshot images courtesy of Bentley.

*Windows Vista Business disk may also be included for future upgrade if desired. To qualify for this downgrade an end user must be a business (including governmental or educational institutions) and is expected to order at least 25 customer systems with the same custom image.

**Certain Windows Vista product features require advanced or additional hardware. See

www.microsoft.com/windowsvista/getready/hardwarereqs.mspx and www.microsoft.com/windowsvista/getready/capable.mspx for details. Windows Vista Upgrade Advisor can help you determine which features of Windows Vista will run on your computer. To download the tool, visit www.windowsvista.com/upgradeadvisor.

Systems may require upgraded and/or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See <http://www.microsoft.com/windows/windows-7/> for details.

¹ Dual- and Quad-Core technologies are designed to improve performance of multithreaded software products and hardware-aware multitasking operating systems and may require appropriate operating system software for full benefits; Not all customers or software applications will necessarily benefit from use of these technologies.

² 64-bit computing on Intel architecture requires a computer system with a processor, chipset, BIOS, operating system, device drivers and applications enabled for Intel® 64 architecture. Processors will not operate (including 32-bit operation) without an Intel 64 architecture-enabled BIOS. Performance will vary depending on your hardware and software configurations. See www.intel.com/info/em64t for more information.

³ The hyperthreading feature is designed to improve performance of multithreaded software products; please contact your software provider to determine software compatibility. Not all customers or software applications will benefit from the use of hyperthreading. Go to <http://www.intel.com/info/hyperthreading/> for more information including which processors support HT Technology.

⁴ Intel's numbering is not a measurement of higher performance.

⁵ Maximum memory capacities assume 64-bit operating systems. Microsoft® Windows® XP (32-bit) supports 4 GB (with Microsoft 32-bit, the amount of usable memory will be dependent upon your system configuration. It may be less than 4 GB); 32-bit Linux can support up to 8 GB.

⁶ Dual Channel is only supported when the system is configured with DDR2 symmetric memory (i.e. 2 x 256).

⁷ Each processor supports up to 3 channels of DDR3 memory. To realize full performance at least 1 DIMM must be inserted into each channel. To get full 6 channel support, 2 processors MUST be installed.

⁸ For hard drives, 1 GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 8 GB of hard drive (or system disk) is reserved for the system recovery software (XP and XP Pro). Up to 12 GB of system disk is reserved for system recovery software. (Vista).

⁹ Actual speeds may vary. Does not permit copying of commercially available DVD movies or other copyright protected materials. Intended for creation and storage of your original material and other lawful uses.

¹⁰ Hardware RAID is not supported on Linux systems. The Linux kernel, with built-in software RAID, provides excellent functionality and performance. It is a good alternative to hardware-based RAID. Please visit

<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00060684/c00060684.pdf> for RAID capabilities with Linux.

¹¹ Weight varies by model.

¹² Intel HT Technology (HT) is designed to improve performance of multi-threaded software products and requires a computer system with a processor supporting HT and an HT-enabled chipset, BIOS, and operating system. Please contact your software provider to determine compatibility. Not all customers or software applications will benefit from the use of HT. See <http://www.intel.com/info/hyperthreading> for more information.

¹³ Enabling Intel® Turbo Boost Technology (Intel® TBT) requires a PC with a processor with Intel TBT capability. Intel TBT performance varies depending on hardware, software, and overall system configuration. For more information, see www.intel.com/technology/turboboost.

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