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. This starts with the HP family of revolutionary, next-generation HP Z Workstations, designed to make complex design and rendering easier and faster than ever before.

The HP Difference

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 3D design and visualization faster and more efficient than ever before. This gives you an edge in five key areas:

- **Innovation:** Enjoy next-generation technology, including a new line of 2D and 3D graphics cards to help you create and visualize even the most complex designs. These are housed in a revolutionary designed tool-less chassis often powered by 89% efficient power supplies.

- **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® processors with advanced processor performance technologies, such as Intel® QuickPath, Intel® Hyper-Threading[1] and Intel® Turbo Boost[2]. Intel® Turbo Boost 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 Advisor, a workstation software wizard with helpful advice on recommended settings and performance; HP SkyRoom, a client-to client video communications and desktop sharing collaboration tool; and HP Remote Graphics Software, a high-performance real-time 3D screen sharing and remote access application.

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.

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 photorealistic 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

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 Advisor 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.

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

Government Computer News (GCN) reported that after reviewing the HP Z400 Workstation on behalf of GCN's 90,000 government IT subscribers, the GCN Lab decided to award it a Product of the Year award for 2009. Of the 300+ products reviewed by the lab this year, only eight were awarded this honor. GCN reported that with their benchmark PassMark Performance Test software, Version 7.0, that the HP Z400 score was impressive—1311.9, which is higher than the fastest dual-core system reviewed for their April 20 issue.

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 Advisor
• HP SpacePilot Pro
• 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 across the globe.

• **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.

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 Advisor

Put the underlying power of HP Workstations at your fingertips, with powerful features that help maximize your hardware, applications, and productivity. HP Performance Advisor 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.

• Measure relative performance of key hardware components using Windows Experience Index.

3

If problems arise, Bentley support staff can review your HP Performance Advisor configuration report included with each HP Workstation. This report can be generated easily by clicking on the configuration tab and saving the file. For more information see **www.hp.com/go/ performanceadvisor**.
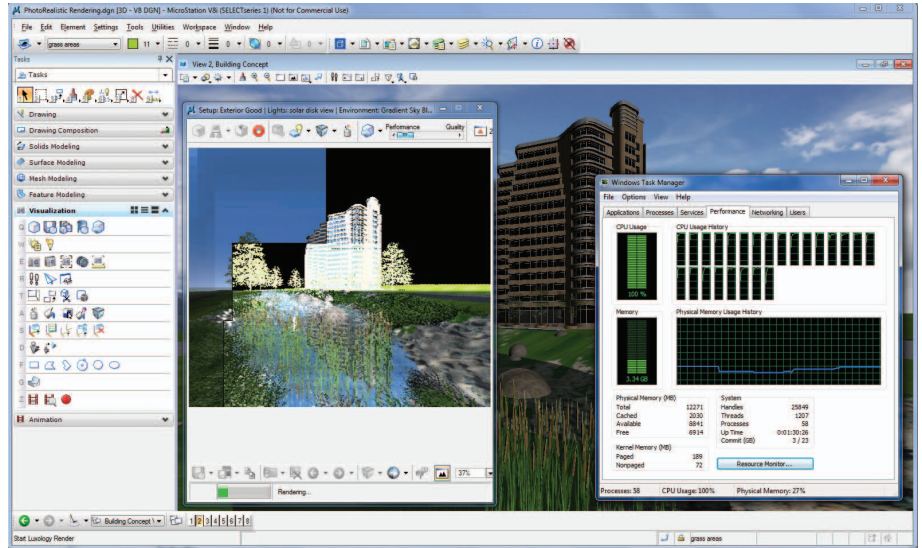
HP SpacePilot Pro

Working in 3D is easier and more efficient with the HP SpacePilot Pro Intelligent Controller, which enables two-handed CAD by combining refined sensing technology, extendable speed keys, and a comfortable design so you can minimize repetitive stress. Studies show significant improvements in user productivity when inputting with an HP SpacePilot Pro. Easily change the center of rotation and quickly pan, zoom, and animate assemblies. With HP SpacePilot Pro, you can intuitively push, tilt, or twist the control cap for an immediate response; Speed keys increase your efficiency and make working in 3D more productive and enjoyable than working with just a mouse and keyboard.

HP Support Assistant

HP Support Assistant makes it easier than ever to own and use an HP Workstation. It comes pre-installed on every workstation with the 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.
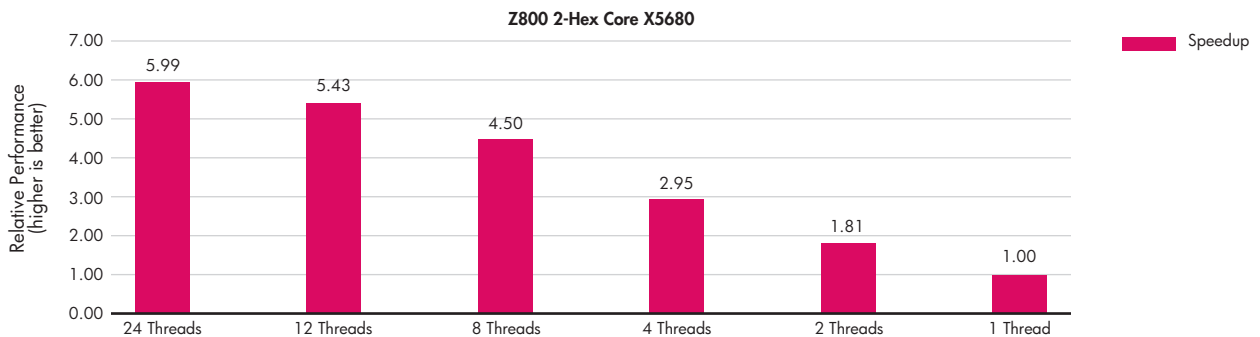
Rendering performance improves with the HP Z Workstation multi-core/multi-processor architecture

- **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 settings 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.

Bentley MicroStation Luxology Rendering

Z800 2-Hex Core X5680

Threads	Speedup
24 Threads	5.99
12 Threads	5.43
8 Threads	4.50
4 Threads	2.95
2 Threads	1.81
1 Thread	1.00

Relative Performance (higher is better)

* Rendering performance requires more processing cores. Choose the HP Z600 or Z800 Workstation with dual processors, and make sure hyper-threading is on.

Cadalyst Labs awarded the HP Z600 Workstation a prestigious Highly Recommended Thumbs Up Award giving it a rare A+ grade. In their words, the HP Z600 is "a testament to the leap in processing technology brought about by this new generation of hardware" and "its innovative design and superb engineering [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.cadalyst. com/hardware/news/ hp-z600-workstation-first-look-review-8130.

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 a competitive edge. All HP Workstations are tested and certified for Bentley applications, helping to ensure reliable, dependable performance. HP Z Workstations deliver enhanced workstation performance with the latest Intel Processors which includes Intel Turbo Boost and Hyper-Threading technologies, in a very affordable package to transform the way 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 helps you work more productively and get the job done faster.

HP Z200 Workstation

HP Z200 Workstation delivers excellent performance and was designed with MicroStation in mind, providing the workstation power for 2D and 3D users to design and edit. It provides ECC Memory for those with larger files and is expandable up to midrange graphics for even more 3D performance capability.
.
HP Z200 Small Form Factor Workstation

HP Z200 Small Form Factor Workstation delivers workstation power in a 65% small package, provides the same processor and memory functionality as the Z200, and has entry level 3D professional graphics and is ideal for MicroStation users who are on a tight budget or who work in constrained spaces.

HP Z400 Workstation

HP Z400 Workstation is ideal for engineers, designers and architects who need the maximum in single socket processor power. Users of MicroStation plus InRoads and Geopak and other Civil and GIS applications more will find this as their main stream workstation. It combines ECC memory to handle large files, as well as the full range of 3D professional graphics, and Intel's latest processors.

HP Z600 Workstation

HP Z600 Workstation packs compute and visualization power to help you work faster and beat deadlines—delivering maximum performance in our smallest, quietest dual socket design with Xeon processors. 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 such as MicroStation Visualization users. This system's dual-processor capability is also well-suited for users of single-threaded applications who occasionally need support for multithreaded applications. Or for multithreaded processes within largely single threaded applications that consume users time such as data loading.

HP Mobile workstations

- **HP Elitebook 8740w Mobile Workstation**—The HP Elitebook 8740w 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,[3] making it a great tool for professionals on the go. The choice of an HP DreamColor screen enables true color visualization in addition to top performance for Bentley applications.

- **HP Elitebook 8440w* and 8540w Mobile Workstations**—HP Elitebook 8440w and 8540w Mobile Workstations offer all the workstation power to run Bentley applications but in a smaller and lighter size with either a 14- or 15-inch diagonal screen. Ideal for those on the go who want to minimize the weight.

* Not available in all regions.

Windows®. Life without Walls™. HP recommends Windows 7.

Meet the HP Workstation family

Model	HP Z200 and Z200 SFF Workstation	HP Z400 Workstation	HP Z600 Workstation	HP Z800 Workstation	HP EliteBook 8440w/ 8540w/8740w Mobile Workstation
User	Ideal for entry level users on a tight budget where workstation performance is needed	Ideal for those who want to maximize performance with single-threaded applications	Ideal for those who occasionally need multi-core performance	Ideal for those who have the largest files and store large data sets	Ideal for those who want the most power a notebook can provide
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[4,5,6,7,8,9]	Intel i3 & i5 Dual Core or Xeon Quad-Core	Dual-, quad-, and six core Intel® Xeon® processor Intel QuickPath Technology	Quad- and six- core Intel Xeon processor Intel QuickPath Technology	Quad- and six- core Intel Xeon processor Intel QuickPath Technology	Intel® Core™ i5 or i7 Mobile Processor Family with Turbo Boost Technology
Graphics cards	NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 Intel HD Graphics(with Dual Core Processors only) ATI FirePro V3800 ATI FirePro V4800 ATI FirePro V5800 NVIDIA FX 380 LP (SFF only)	NVIDIA Quadro FX 380 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800 ATI FirePro V3800 ATI FirePro V4800 ATI FirePro V5800	NVIDIA Quadro FX 380 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800 ATI FirePro V3800 ATI FirePro V4800 ATI FirePro V5800	NVIDIA Quadro FX 380 NVIDIA Quadro FX 580 NVIDIA Quadro FX 1800 NVIDIA Quadro FX 3800 NVIDIA Quadro FX 4800 NVIDIA Quadro FX 5800 ATI FirePro V3800 ATI FirePro V4800 ATI FirePro V5800 ATI FirePro V8800	NVIDIA Quadro FX 380M NVIDIA Quadro FX 880M NVIDIA Quadro FX 1800M NVIDIA Quadro FX 2800M NVIDIA Quadro FX 3800M AMD FirePro M5800 AMD FirePro M7820

Windows®. Life without Walls™. HP recommends Windows 7.

Suggested configurations
(ALL APPLICATIONS CERTIFIED)

HP Recommended Configurations

Bentley MicroStation® Entry Level

Bentley MicroStation® Standard User

Bentley MicroStation® Visualization

Bentley MicroStation® Mobile User

HP Z200 Small Form Factor Workstation	**HP Z200 Workstation**	**HP Z600 Workstation**	**HP Elitebook 8540w Mobile Workstation**
Genuine Windows 7 Professional 64-bit	Genuine Windows 7 Professional 64-bit	Genuine Windows 7 Professional 64-bit	Genuine Windows 7 Professional 64-bit
Intel® Core™ i5-670 Processor (3.46 GHz, 4 MB cache, 1333 MHz memory)	Intel® Core™ i5-670 Processor (3.46 GHz, 4 MB cache, 1333 MHz memory)	Dual Quad-Core Intel X5667 (3.06 GHz 8MB cache, 1333 MHz memory)	Intel Core i7-820QM Processor (1.73 GHz, 8 MB L3 cache)
Intel® 3450 chipset	Intel® 3450 chipset	Intel® 5520 chipset	15.6-inch diagonal LED Back lit anti-glare (1920 x 1200)
4 GB 1333 MHz DDR3 ECC Unbuffered SDRAM	8 GB DDR3 ECC memory[7]	12 GB DDR3 ECC memory	ATI FirePro M5800
ATI FirePro V3800	ATI FirePro V4800	ATI FirePro V4800	8 GB DDR3 1333Mhz RAM memory[7,8]
500 GB 7200 rpm SATA NCQ[10]	320 GB 7200 rpm SATA[10]	(2) 300 GB 10k rpm SATA Raid 0[12]	250 GB 7200 rpm SATA 2.5-inch hard drive[10]
DVD-ROM SATA[11]	DVD-ROM SATA[11]	DVD-ROM SATA[11]	DVD/CD RW Combo[11]
HP ZR24w 24-inch Widescreen LCD Monitor	HP ZR24w 24-inch Widescreen LCD Monitor	HP ZR24w 24-inch Widescreen LCD Monitor	Starting at 6.5 pounds[13]
HP Remote Graphics Software	HP Remote Graphics Software	HP Remote Graphics Software	Business rugged design
HP SkyRoom	HP SkyRoom	HP SkyRoom	HP Remote Graphics Software
HP Performance Advisor	HP Performance Advisor	HP Performance Advisor	HP Performance Advisor
HP Scroll Mouse	HP Scroll Mouse	HP Scroll Mouse	Application certified
Application certified	Application certified	Application certified	3–year limited warranty

Contact information

Hewlett-Packard USA:
+1 (281) 370 0670
11445 Compaq Center Dr.
Houston, Texas 77070 USA

HP Small and Medium Business Store:
+1 (800) 888 0262
www.hp.com/go/store

Buy Direct from HP
By phone: 1-800-888-0262
8am - 9pm ET (5am - 6pm PT) Monday - Friday
Closed weekends and holidays
www.hp.com/sbso/buspurchase_info.html

Buy from an HP Partner
www.hp.com/sbso/buspurchase_info.html

Hewlett-Packard Canada Ltd.:
(905) 206 4725
5150 Spectrum Way
Mississauga, Ontario
L4W 5G1
Canada

Hewlett-Packard Latin America:
+1 (305) 267 4220
Waterford Building, 9th Floor
5200 Blue Lagoon Drive
Miami, Florida 33126
USA

Hewlett-Packard Asia Pacific Pte Ltd.:
(+65) 6275 3888
138, Depot Road
Singapore 109683

Hewlett-Packard Japan:
(+81) 3 6416 6444
7 Gobancho, Chiyoda-ku
Tokyo 102-0076 Japan

Hewlett-Packard Europe, Middle East, Africa:
(+41) 22 780 8111
150 Route du Nant-d`Avril
1217 Meyrin 2
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

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   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.
2   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.
3   Testing was not intended to demonstrate fitness for DOD contracts requirements or for military use. Test results are not a guarantee of future performance under these test conditions.
4   Dual-, Quad-, and Six-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.
5   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.
6   Intel's numbering is not a measurement of higher performance.
7   Maximum memory capacities assume 64-bit operating systems. With Microsoft 32-bit operating systems, 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.
8   Dual Channel is only supported when the system is configured with DDR2 symmetric memory (i.e. 2 x 256).
9   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.
10 For hard drives, GB = 1 billion bytes. 1 TB = 1 trillion bytes. Actual formatted capacity is less. Up to 16GB of system disk (for Windows 7) is reserved for system recovery software.
11 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.
12 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.
13 Weight varies by configuration.

4AA1-4936ENW, May 2010