

# POSITIONING THE HP Z400 WORKSTATION AGAINST I7-BASED High-end PCs

Introduction: The single-socket Intel® Nehalem architecture is available on high-end PCs with Intel® Core™ i7 processors. The purpose of this document is to provide an overview of the benefits of considering an HP Z400 Workstation with Intel® Xeon® technology over such i7-based products.

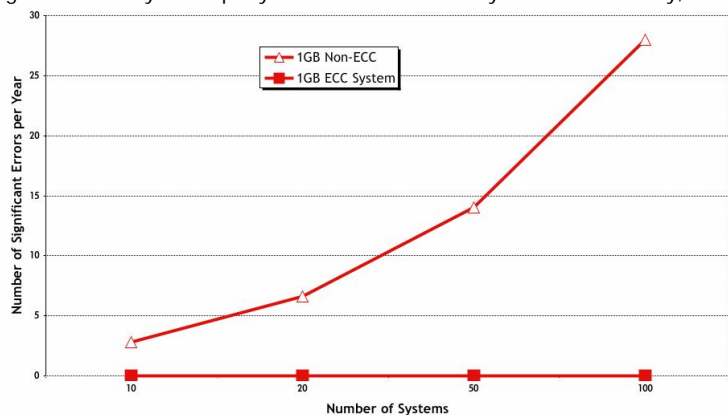
Technology differences between the Xeon 3500 series processors and the Intel Core i7 processors:

The Xeon W3500 Series single socket workstation processors provide two key benefits over Core i7 desktop processors:

- Support for ECC memory, providing increased system reliability
- Direct Cache Access<sup>1</sup> for enhanced network performance

ECC Memory overview and benefits: Unlike typical desktops that lack this feature, HP Z400 Workstations support Error Checking and Correction (ECC) memory. This server-like feature provides protection against “soft” (transient) errors in system memory that could lead to process and application failures. ECC memory detects and corrects soft single-bit memory errors—errors that are inherent to all DRAM-based systems. If a desktop user is primarily running e-mail and word processing applications, data integrity issues may not be important; when running business-critical applications, a zero flipped to a one (or vice-versa) could be disastrous.

Figure 1. Memory errors per year for non-ECC memory. For ECC memory, the number is always zero.



Direct Cache Access<sup>1</sup> provides a significant reduction in memory latency and memory bandwidth for receive intensive network I/O applications. For more details, please refer to the research paper link in the footnotes.

Overall benefits offered by the HP Z400 over i7 PCs

- Highly expandable and reliable. Workstation subsystems are designed for longer lifecycles, higher performance graphics, and support for multiple monitors. I/O reliability, performance, flexibility, and capacity are important to professional applications and the large files that they often manipulate. The HP Z400 allows the flexibility of a wide range of disk subsystems, ranging from low-cost Serial ATA (SATA) drives and interfaces to server-class, high-performance 10K rpm SATA and 15K RPM Serial-attached SCSI (SAS) drives. The HP Z400 supports a wide range of professional 3D graphics cards from NVIDIA and ATI, and can reliably support up to 6 monitors, allowing visualization of huge amounts of data from multiple sources without the need to toggle between applications.
- Robust chassis design. The electromechanical design of an HP workstation supports more and higher powered I/O cards, disk subsystems and multiple displays. Thermals and acoustics are a critical part of HP workstation design. Even with power-hungry configurations, HP workstations work very quietly—even more so with optional Liquid Cooling technology (Q3 2009).
- HP Total Care beyond the box. HP makes specific investments in worldwide service and support of workstations, the benchmarking of workstation applications, as well as tools for lifecycle and infrastructure management. Close relationships with ISVs help ensure that HP Workstations are fully certified and optimized for your applications. Leveraging these relationships, HP’s unique Performance Tuning Framework helps ease configuration and updates while optimizing a range of professional applications. What’s more, HP workstations provide platform stability with long lifecycle management and Product Change Notification services.

<sup>1</sup>Direct Cache Access research paper: <http://www.stanford.edu/group/comparch/papers/huggahalli05.pdf>

