



Sales Brief

Workstation

Quad-Core Intel® Xeon®
Processor 5400 Series

Superior Performance for Complex Compute Challenges

At Intel, we recognize that you need more than just processors that deliver greater performance. That's why we provide platform-based solutions that maximize performance, improve throughput, and add new embedded technologies that give business, creative, and scientific professionals the tools to solve problems faster, process larger data sets, and meet bigger challenges.

Two-processor technical compute servers and workstations based on the Quad-Core and Dual-Core Intel® Xeon® processor 5400 and 5200 series¹ integrate greater processing capabilities, faster I/O and graphics, and increased memory capacity. These multi-core workstations and technical computers transform complex data into actionable information faster than previous Intel Xeon processor-based solutions, which means you can simulate more and discover faster.

The Quad-Core Intel Xeon processor 5400 series is built with the new 45nm next-generation Intel® Core™ microarchitecture which delivers more performance in the same platforms and at the same power consumption for data demanding applications, and has 50% larger L2 Cache, and new levels of breakthrough energy efficiency. Systems using two Quad-Core Intel Xeon processors 5400 series have up to 8 computational engines delivering in excess of 100 GFLOPS to 64-bit applications, and delivers up to 34% higher performance on bandwidth-intensive benchmarks² over previous-generation processors. With two 1600 MHz Front-Side Buses (FSB), data throughput and system performance can be significantly improved – which means you have the power you need to run demanding, multi-tasking, multi-threaded applications.

Intel® Xeon® Processor 5400¹ Series: Build Success into Your Business

Performance and Density

- Second-generation quad-core technology delivers up to a 34% performance increase, giving greater performance at higher frequencies.²
- High-performance radix 16 dividers roughly double the divider speed over previous generations for scientific computations, 3D transformations, and other mathematically intensive functions.

Performance Per Watt

- New 45nm process technology enables denser, more powerful HPC designs, plus quieter, cooler and faster workstations.
- Intel's high-performance and energy-smart architectures deliver more performance over previous generations, enabling data centers to increase their throughput and raw performance while initiating the same power envelope. Up to 5x the throughput of AMD processors.³

Increased Throughput

- With four compute engines per processor, Quad-Core Intel® Xeon® processor 5400 series delivers the multi-tasking performance required to maximize your compute environment, enabling workstation and high-performance computing applications to be more responsive.

For more information on the Intel® Xeon® processor,
visit www.intel.com/xeon



Quad-Core Intel® Xeon® Processor 5400 Series⁴

Features	Benefits
Multi-core Processing	<ul style="list-style-type: none"> Maximizes scalable performance and cost/virtual machines. Second-generation Quad-Core processors built on 45nm technology boosts performance. Increases performance and threading headroom for multi-threaded applications and heavy multi-tasking scenarios. Helps boost system utilization through virtualization and application responsiveness. Also available in dual-core SKUs (Dual-Core Intel® Xeon® processor 5200¹ series).
Intel® Core™ Microarchitecture	<ul style="list-style-type: none"> Better performance on multiple application types and user environments as well as data-demanding workloads. Reduced cooling challenges with performance-per-watt improvements, enabling denser data center deployments.
Large 12 MB of On-die L2 Cache (2 x 6 MB)	<ul style="list-style-type: none"> Increases efficiency of L2 Cache-to-core data transfers, maximizing main memory to processor bandwidth and reducing latency. Reduces latency by storing larger data sets closer to the processor, reducing the number of trips to main memory. Up to 6 MB of L2 Cache can be allocated to one core.
Intel® Virtualization Technology ⁵	<ul style="list-style-type: none"> Processor enhancements that assists virtualization software to deliver more efficient virtualization solutions and greater capabilities including 64-bit guest OS support. Intel® VT FlexPriority, a new Intel® VT extension that optimizes virtualization software efficiency by improving interrupt handling. Intel® VT FlexMigration⁶ enables Intel Xeon processor 5400 and 5200 series-based systems to be added to existing virtualization pools with single, 2, or 4+ socket Intel Core microarchitecture-based servers.
24 MB Snoop Filter	<ul style="list-style-type: none"> Significantly reduces data traffic on the FSBs, providing lower latencies and greater available bandwidth. The snoop filter maintains an index of the current cached data in each processor, eliminating unnecessary snoops and boosting available bandwidth.
Intel® I/O Acceleration Technology (Intel® I/OAT)	<ul style="list-style-type: none"> Moves data more efficiently through Quad-Core and Dual-Core Intel Xeon processor-based servers for fast, scalable, and reliable networking.
Fully Buffered DIMM (FBDIMM) Technology	<ul style="list-style-type: none"> Increasing memory speed to 800 MHz.
1600 MHz Front-Side Bus (FSB)	<ul style="list-style-type: none"> Fast, dedicated interconnects for increased throughput.
Intel® 64 Architecture ⁷	<ul style="list-style-type: none"> Flexibility for 64-bit and 32-bit applications and operating systems.
PCIe* Gen 2	<ul style="list-style-type: none"> 2x the bandwidth of previous-generation PCIe to reduce latency and improve the performance of I/O-intensive applications.

¹ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details.

² Based on measured result on SPECfp*_rate2006 benchmark. SPEC binaries built with Intel® Compiler 10.1 for 64-bit Linux Servers are configured with 64-Bit SUSE LINUX Enterprise Server 10 and 16 GB (8x2 GB) of memory.

Intel® server pre-production platform with two Quad-Core Intel® Xeon® processor X5365 (3.00 GHz) w/ 2x4M L2 Cache, 1333 MHz FSB, 5000p "Blackford" Chipset. All measurements use FB DDR2-667 MHz memory.

Intel® server pre-production platform with two Quad-Core Intel® Xeon® processor X5472 (3.0 GHz) w/ 2x6M L2 Cache, 1600 MHz FSB, 400 "Seaburg" Chipset. All measurements use FB DDR2-800 MHz memory.

³ Intel internal measurement as of May 10, 2007 using SPECint_rate_base2000* with Intel® Xeon® Tigerton processor 2.93 GHz. Results compare Intel measured Quad-Core Intel Xeon Tigerton processor (2.66 GHz) or (2.93 GHz), with 2x4M L2 Cache, 1066 MHz system bus, Clarksboro Chipset vs. published Dual-Core AMD Opteron® Model 8220SE (2.85GHz).

⁴ Platforms built on Intel® 5400 Chipset. Performance and competitive information is accurate at time of document publication. For latest competitive and performance information, visit www.intel.com/performance.

⁵ Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain platform software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

⁶ Intel internal measurement. Platforms running 4x Intel® Xeon® processor X7350, 32 GB memory, vConsolidate Beta 2, Virtual Iron 4.0.2 software. 1 CSU configuration, Sept 2007. Boot time improvement measured on Windows XP. vConsolidate measurement conducted by configuring the system with Windows 2000 SP4.

⁷ 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. Performance will vary depending on your hardware and software configurations. Consult with your system vendor for more information.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT, EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS. INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information. The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request. Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order. Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or by visiting www.intel.com.

*Other names and brands may be claimed as the property of their owners.

Copyright © 2007 Intel Corporation. All rights reserved. Intel, the Intel logo, Intel Leap ahead, Intel Leap ahead logo, Xeon, Intel Core, and the Intel Xeon inside logo are trademarks of Intel Corporation in the U.S. and other countries.

