



The Power of Compute in Dense 4-Socket Servers



Based on Intel's leading-edge 22nm process technology, the Intel® Xeon® processor E5-4600 v2 product family provides a density optimized, energy efficient and compute intensive 4-socket processor solution to extend the value of the Intel® Xeon® processor E5 v2 family to 4-socket.

Up to 40 Percent Higher Average Performance

The Intel® Xeon® processor E5-4600 v2 product family provides 50 percent more cores and cache than the previous generation, along with faster memory and additional hardware features. These innovations deliver up to 40 percent higher performance² on average over previous generation Intel® Xeon® processor-based servers across a broad range of benchmarks.

- **New virtualization efficiencies.** Advanced Programmable Interrupt Controller virtualization (APICv) takes the value of Intel® Virtualization Technology (Intel® VT) to new heights. By eliminating up to 50 percent of virtual machine exits, it reduces virtualization overhead to 4 percent CPU utilization³ to further improve performance and scalability.

Security Features for Enhanced Data Integrity

- Improved hardware-embedded security for an even safer environment for your enterprise data

- Intel® Data Protection Technology with Secure Key⁴ for faster and more secure encryption through a chipset-independent digital random number generator (DRNG).
- Intel® Platform Protection Technology with OS Guard⁵ for improved protection against malware by preventing execution calls to the OS from compromised apps in the user mode or code pages.

Driving Down Energy Costs at Every Level

Power and cooling costs continue to rise. The Intel Xeon processor E5-4600 v2 product family can help you get more value out of every watt by optimizing performance versus energy consumption, not only for individual servers, but also for racks, rows, and entire data centers.

- **Industry-leading energy efficiency per server.** Intel's 22nm, 3-D Tri-Gate transistors use just half the power⁶ of prior-generation transistors operating at the same performance level. Intel® Intelligent Power Technology⁷ adds to these gains by dynamically optimizing performance versus energy consumption across all operating points.
- **Automated control of server power.** Intel® Node Manager lets you monitor and control server power and set maximum limits for each server. Use it to increase rack densities, adjust cooling based on

actual demand, improve business continuity, and dynamically balance resources to accomplish more while spending less.

- **Power optimization across your data center.** Intel® Data Center Manager plugs into existing management frameworks to enable power and thermal monitoring and management for individual servers and groups of servers. You gain unprecedented insight and control over power, cooling, and performance throughout your data center.

Optimized Platform Solutions

Intel delivers higher value by engineering complete, highly-optimized platform solutions.

- Use Intel® 10 Gigabit Ethernet to improve performance for demanding workloads and to consolidate your data center traffic onto a single, scalable, cloud-ready network.
- Add Intel® Cache Acceleration Software (Intel® CAS) and one or more Intel® Solid-State Drives (Intel® SSDs) per server to dramatically and cost-effectively boost storage performance.

INTEL® XEON® PROCESSOR E5-4600 V2 PRODUCT FAMILY SPECIFICATIONS

PROCESSOR NUMBER ¹	CPU FREQUENCY (GHZ)	INTEL® TURBO BOOST TECHNOLOGY	INTEL® HT TECHNOLOGY	L3 CACHE	NUMBER OF CORES	POWER	INTEL® QPI LINK SPEED	DDR3 MEMORY
For 4 Socket Servers - Advanced								
Intel® Xeon® Processor E5-4657L v2	2.4	2.0	✓	30 MB	12	115 W	8.0 GT/s	1866
Intel® Xeon® Processor E5-4650 v2	2.4	2.0	✓	25 MB	10	95 W	8.0 GT/s	1866
Intel® Xeon® Processor E5-4640 v2	2.2	2.0	✓	20 MB	10	95 W	8.0 GT/s	1866
Intel® Xeon® Processor E5-4627 v2	3.3	2.0	—	16 MB	8	130 W	7.2 GT/s	1866
For 4 Socket Servers - Standard								
Intel® Xeon® Processor E5-4620 v2	2.6	2.0	✓	20 MB	8	95 W	7.2 GT/s	1600
Intel® Xeon® Processor E5-4610 v2	2.3	2.0	✓	16 MB	8	95 W	7.2 GT/s	1600
For 2 Socket Servers - Basic								
Intel® Xeon® Processor E5-4607 v2	2.6	—	✓	15 MB	6	95 W	6.4 GT/s	1333
Intel® Xeon® Processor E5-4603 v2	2.2	—	✓	10 MB	4	95 W	6.4 GT/s	1333

^a GT/s = giga-transfers/second

INTEL XEON PROCESSOR E5 V2 FAMILY OVERVIEW

Advanced multi-core, multi-threaded processing	<ul style="list-style-type: none"> Up to 12 cores and 24 threads per socket
Larger cache and faster memory	<ul style="list-style-type: none"> Up to 30 MB of last level cache for fast access to frequently used data Up to 48 DIMMs per four-socket server Faster maximum memory speeds than the previous generation (1866 MHz versus 1600 MHz)
Higher performance for peak workloads	<ul style="list-style-type: none"> Intel® Turbo Boost Technology 2.0⁸ takes advantage of power and thermal headroom to increase processor frequencies for peak workloads
Higher performance for HPC applications^{*,9}	<ul style="list-style-type: none"> Intel® Advanced Vector Extensions (Intel® AVX) speeds vector and floating point computations, with support for 256-bit vectors and accelerated 32/64 bit data conversions
Improved virtualization efficiency	<ul style="list-style-type: none"> Advanced Programmable Interrupt Controller virtualization (APICv) enhances Intel Virtualization Technology by eliminating up to 50 percent of virtual machine exits
Integrated storage/server processor	<ul style="list-style-type: none"> Supports key storage processor features, including x16 non-transparent bridging (vs. x8 NTB) to increase scalability and accelerated RAID for implementing RAID 5 and 6 without a custom ASIC
Stronger, faster data encryption	<p>Intel® Data Protection Technology with:</p> <ul style="list-style-type: none"> Secure Key, which provides high-quality security keys Intel® Advanced Encryption Standard-New Instructions (Intel® AES-NI), which enables encryption to be implemented pervasively without sacrificing application response times
A better foundation for secure-multi tenancy	<p>Intel® Platform Protection Technology with:</p> <ul style="list-style-type: none"> Intel® Trusted Execution Technology (Intel® TXT), which enables IT to establish trusted pools of virtualized resources for stronger security and compliance in multi-tenant virtual and cloud environments OS Guard, which protects against escalation of privilege attacks that attempt to gain control of the platform or execute malware
Industry-leading energy-efficiency	<ul style="list-style-type: none"> Intel 22 nm, 3-D tri-gate transistors cut power consumption by half versus the prior generation^{*,6} Intel® Intelligent Power Technology⁷ dynamically manages CPU and memory energy states to minimize power without slowing performance
Comprehensive monitoring and control	<ul style="list-style-type: none"> Intel® Node Manager lets IT monitor and control server power Intel® Data Center Manager lets IT dynamically optimize energy-consumption at every level, from individual servers, racks, and rows to entire data centers

To learn more about the Intel Xeon processor E5-4600 v2 product family, visit www.intel.com/xeonE5.

Visit us at:



+ Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

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. All performance claims source are Intel internal measurements as of February 25, 2014. Claim of up to an average 40% overall gain based on results of six key industry-standard workloads: SPECint*_rate_base2006+, SPECfp*_rate_base2006+, brokerage on-line transaction processing (OLTP) database workload, warehouse supply chain OLTP database workload, STREAM memory bandwidth and LINPACK GFLOPS. Configurations: 4-socket server using Intel® Xeon® processor E5-4657L v2 (new processor) vs. E5-4650 (previous generation processor). Source: Intel internal testing technical reports #1324 and 1371 as of February 2013.
3. Configuration : Pre-Production 1S Intel® Xeon® Processor E5-2600 (3.0 GHz, 4-core, 10 MB L3 cache, B0-stepping), HyperThreading ON, Turbo OFF, EIST OFF, CPU C-state OFF, Power feature OFF, Virtualization Technology ON, NUMA ON, Prefetch OFF, 64GB SSD, Xen-unstable C/S23237 w/ APIC-v patch. Hypervisor CPU utilization with no APICv: 5.5%; Hypervisor CPU utilization with APICv: 4%. Source: Intel internal measurements as of December 2011.
4. No computer system can provide absolute security. Requires an enabled Intel® processor and software optimized for use of the technology. Consult your system manufacturer and/or software vendor for more information
5. No computer system can provide absolute security. Requires an enabled Intel® processor, enabled chipset, firmware, software, may require a subscription with a capable service provider (may not be available in all countries). Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. Consult your Service Provider for availability and functionality. For more information, visit <http://www.intel.com/go/anti-theft>. Consult your system manufacturer and/or software vendor for more information.
6. Compared to previous generation 2-D transistors on 32nm planar transistors. Source: Intel internal testing
7. Intel® Intelligent Power Technology requires a computer system with an enabled Intel® processor, chipset, BIOS and for some features, an operating system enabled for it. Functionality or other benefits may vary depending on hardware implementation and may require a BIOS and/or operating system update. Please check with your system vendor for details.
8. Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>
9. Intel® Advanced Vector Extensions (Intel® AVX)* are designed to achieve higher throughput for certain integer and floating point operations. Due to varying processor power characteristics, utilizing AVX instructions may cause a) some parts to operate at less than the rated frequency and b) some parts with Intel® Turbo Boost Technology 2.0 to not achieve any or maximum turbo frequencies. Performance varies depending on hardware, software, and system configuration and you should consult your system manufacturer for more information. * Intel® Advanced Vector Extensions refers to Intel® AVX, Intel® AVX2 or Intel® AVX-512. For more information on Intel® Turbo Boost Technology 2.0, visit <http://www.intel.com/go/turbo>

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Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.

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