Product Brief

Intel® Xeon® Processor
E7-8800/4800/2800
Product Families

Mission-Critical Solutions

Transforming Mission-Critical Computing

Intel® Xeon® Processor E7-8800/4800/2800 Product Families

Solve your mission-critical IT challenges of managing and keeping secure the data crucial to your business with a powerful and reliable server featuring the Intel® Xeon® processor E7-8800/4800/2800 product families. These top-of-the-line processors deliver performance that is ideal for your most data-demanding workloads with improved scalability, and increased memory and I/O capacity, allowing you to handily adapt to changes in short-term business demands, and address requirements for longer-term business growth. Advanced reliability and security features work to maintain data integrity, accelerate encrypted transactions, and maximize the availability of mission-critical applications. The powerful and reliable Intel Xeon processor E7-8800/4800/2800 product families – flexibility for your business-critical solutions.

Optimized Performance for the Most Demanding Applications

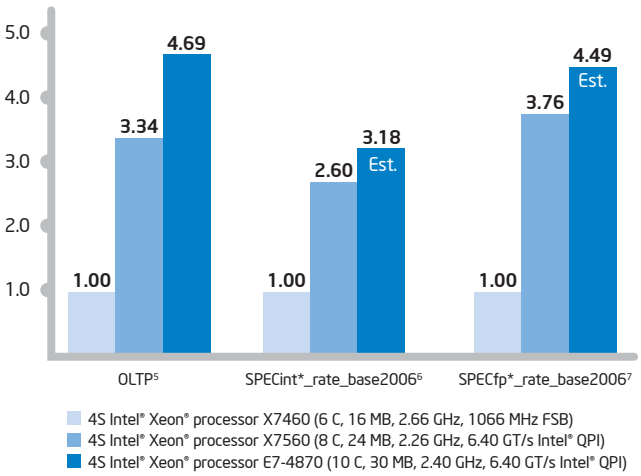
The Intel Xeon processor E7-8800/4800/2800 product families deliver the highest performance of Intel® Xeon® processors for enterprise, mission-critical, and high-performance computing (HPC) deployments. With up to 10 cores and 20 threads, up to 30 MB of last-level cache, and supporting up to 32 GB DIMMs, the Intel Xeon processor E7-8800/4800/2800 product families are ideal for large data centers, ERP, SCM, and CRM applications, and the most demanding scientific and financial workloads.

Mission-Critical Reliability

Intel Xeon processor E7-8800/4800/2800 product families expand on the reliability features IT managers trust in Intel Xeon processors and expect in mission-critical solutions, such as Machine Check Architecture Recovery (MCA-R), with more advanced enhancements.

- **Double Data Device Correction (DDDC) –** extends reliability by recovering from *two* DRAM device failures, instead of a single failure of SDDC, helping maximize uptime.
- **Partial Memory Mirroring –** enables more flexible, effective, and cost-efficient memory mirroring of critical areas instead of all memory, reducing server energy demands while protecting your most important data.

Generation Performance[4]



Faster, Stronger, Enterprise-Wide Data Protection

IT services can now deliver high-performance security throughout the enterprise with systems based on the Intel Xeon processor E7-8800/4800/2800 product families. The Intel Xeon processor E7-8800/4800/2800 product families make encryption software faster and stronger by accelerating secure transactions with Intel® Advanced Encryption Standard – New Instructions[1] (Intel® AES-NI). Intel AES-NI delivers a high-performance engine for online transactions and ubiquitous, enterprise-wide data protection using supported software from leading vendors, such as Oracle, Microsoft, and McAfee.

Table 1. Intel® Xeon® processor E7-8800/4800/2800 product families overview

Feature	Benefits
Up to 10-core/20-thread processing	▪ Performance, scalability, and headroom for the most data-demanding, mission-critical applications ▪ Ideal for virtualized data centers and cloud computing ▪ Extremely powerful processing for High-performance Computing (HPC) buildouts ▪ Perfect for expandable server deployments in scalable, cost-efficient enterprise data centers
32 GB DIMM support	▪ Large memory support (up to 2 TB per 4-socket system) for massively scalable deployments and mission-critical workloads ▪ 102 GB/s memory bandwidth supports extreme, demanding computing applications
Up to 30 MB last-level cache	▪ Accelerates processing by bringing – and keeping – more data closer to the cores and reducing memory reads
Improved performance/efficiency	▪ Built on the 32 nm Intel® process technology designed for high standards and expectations in performance, features, and energy efficiency ▪ 25 percent more cores and last-level cache, plus twice the memory capacity in the same power envelope as Intel® Xeon® processor 7500 series ▪ LV DIMM support with reduced power memory buffers help contain operating costs while improving performance on large memory systems ▪ Intel® Intelligent Power Technology,[3] with integrated power gates (C6 core and package), independently reduces core power to 0W at idle and reduces package power to near-0W at idle to help reduce power costs in large data centers
Designed for high security deployments	▪ Intel® Advanced Encryption Standard – New Instructions[1] (Intel® AES-NI) protects sensitive business assets and private data with faster and more advanced secure transactions for enterprise and cloud computing ▪ Intel® Trusted Execution Technology[2] (Intel® TXT) helps ensure a secure virtual environment by protecting virtual platforms against malicious software prior to VM launch
Mission-critical/HPC-level reliability features	▪ Machine Check Architecture recovery (MCA-R) keeps servers alive and operating in the event of certain memory errors ▪ Double Device Data Correction (DDDC) adds greater protection against data loss than Single Device Data Correction (SDDC) by recovering data if two memory devices fail ▪ Partial Memory Mirroring enables lower cost, more flexible data protection by selectively mirroring the most critical memory areas

Hardened Protection for Virtual Environments

The Intel Xeon processor E7-8800/4800/2800 product families integrate enhanced protection for virtual environments with Intel® Trusted Execution Technology[2] (Intel® TXT). This protection layer hardens virtual environments in cloud computing and enterprise data centers against malicious software insertions – before virtual machines (VMs) launch. And Intel TXT keeps VMs protected by measuring and matching known, good environments against unknown code, and then blocking any-thing suspicious before launching the VMs. Invading code pieces, such as rootkits, are isolated during bootup, enforcing a safe, protected platform for VMs.

Unmatched Power Efficiency

The Intel Xeon processor E7-8800/4800/2800 product families, with Intel® Intelligent Power Technology,[3] deliver higher performance from 25 percent more cores, threads, and last-level cache, *at the same maximum rated power (TDP)* as the Intel® Xeon® processor 7500 series. Intel Xeon processor E7-8800/4800/2800 product families' cores can independently shut down to 0W when idle, and the entire processor can reach near-0W power at idle, delivering unmatched power/performance efficiency of Intel Xeon processors. Support for low-voltage (LV) DIMMS and integrated reduced-power memory buffers further reduce energy demand, which help cut operating costs – while delivering the performance needed in today's data centers.

Table 2. Intel® Xeon® Processor E7 Family Specifications

Processor Number[Δ]	Cores/ Threads	Cache	Bus Speed	Max TDP	Intel® Turbo Boost Technology[8]	Intel® HT Technology[9]
32 nm						
Intel® Xeon® Processor E7-8870	10/20	30 MB	6.40 GT/s[a] QPI	130 W	▪	▪
Intel® Xeon® Processor E7-8867L	10/20	30 MB	6.40 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-8860	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-8850	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-8837	8/8	24 MB	6.40 GT/s QPI	130 W	▪	
Intel® Xeon® Processor E7-8830	8/16	24 MB	6.40 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-4870	10/20	30 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-4860	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-4850	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-4830	8/16	24 MB	6.40 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-4820	8/16	18 MB	5.86 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-4807	6/12	18 MB	4.80 GT/s QPI	95 W		▪
Intel® Xeon® Processor E7-2870	10/20	30 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-2860	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-2850	10/20	24 MB	6.40 GT/s QPI	130 W	▪	▪
Intel® Xeon® Processor E7-2830	8/16	24 MB	6.40 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-2820	8/16	18 MB	5.86 GT/s QPI	105 W	▪	▪
Intel® Xeon® Processor E7-2803	6/12	18 MB	4.80 GT/s QPI	105 W		▪

[a] GT/s = giga-transfers/second

To learn more about the Intel Xeon processor E7-8800/4800/2800 product families, visit www.intel.com/products/server/processor/xeonE7/index.htm.

[Δ] 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.

[1] Intel® AES-NI requires a computer system with an AES-NI enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on Intel® Core™ i5-600 Desktop Processor Series, Intel® Core™ i7-600 Mobile Processor Series, and Intel® Core™ i5-500 Mobile Processor Series. For availability, consult your reseller or system manufacturer. For more information, see http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/.

[2] No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer system with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). Intel TXT also requires the system to contain a TPM v1.s. For more information, visit http://www.intel.com/technology/security.

[3] 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.

[4] Generation Performance Summary Configuration Details, Intel® Xeon® Processor E7 Family, as of April 4, 2011:
– 4-socket server processor models relative performance comparison using OLTP internal workload, SPECint*_rate_base2006 ("Base Score"), and SPECfp*_rate_base2006 ("Base Score")

SPEC, SPECint, and SPECfp are registered trademarks of the Standard Performance Evaluation Corporation. Comparisons stated above reflect Intel internally measured results (marked estimates until published) based on the best performing four-socket servers using Intel® Xeon® processor Models 7400 / 7500 series and E7-4800 product family. For the latest CPU2006 results, visit http://www.spec.org/cpu2006/results/.

Refer to our Optimization Notice (http://software.intel.com/en-us/articles/optimization-notice) for more information regarding performance and optimization choices in Intel® software products.

OLTP internal workload was scaled to derive estimated database performance. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. 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. For configurations, see the following footnotes 5-7.

[5] OLTP workload on 4-socket (4S) populated servers using a leading database vendor comparing Intel Xeon processor X7460 with 256GB memory as baseline 1.0 to X7560 with 512GB memory and E7-4870 with 1TB models all otherwise comparably configured.

[6] SPECint_rate_base2006 on 4-socket (4S) populated servers using Intel® C++ Compiler 11.1 comparing Intel Xeon processor X7460 as baseline 1.0 to X7560 and E7-4870 models all otherwise comparably configured.

[7] SPECfp_rate_base2006 on 4-socket (4S) populated servers using Intel® Fortran and C++ Compilers 11.1 comparing Intel Xeon processor X7460 as baseline 1.0 to X7560 and E7-4870 models all otherwise comparably configured.

[8] Requires a system with Intel® Turbo Boost Technology capability. Intel Turbo Boost Technology 2.0 is the next generation of Turbo Boost Technology and is only available on 2nd gen Intel® Core™ processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/technology/turboboost.

[9] Requires an Intel® HT Technology enabled system, check with your PC manufacturer. Performance will vary depending on the specific hardware and software used. Not available on Intel® Core™ i5-750. For more information including details on which processors support HT Technology, visit http://www.intel.com/info/hyperthreading.

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