Unprecedented Reliability and Scalability in a Multi-Processor Server with the Intel® Xeon® Processor 7500 Series

The new Intel® Xeon® processor 7500 series delivers up to 3.7x1 greater performance along with expanded scalability and a greatly enhanced suite of reliability features.

Whether you've got data-demanding applications, are deploying a private cloud, or are using virtualization to consolidate your data center or develop a robust data recovery plan, the Intel® Xeon® processor 7500 series, with Next-Generation Intel® Microarchitecture (Nehalem), expands server capabilities with world-record-breaking performance. With enhanced 45nm technology, Next-Generation Intel Microarchitecture (Nehalem) and Intel® Virtualization Technology, the Intel Xeon processor 7500 series-based servers help drive your data-demanding enterprise applications faster. Delivering a quantum leap in enterprise computing performance, the Intel Xeon processor 7500 series features eight cores supporting up to 16 processing threads and 24 MB of cache per processor, and four advanced, high-bandwidth interconnect links that allow multiple processors to be directly connected to each other. In fact, the Intel Xeon processor 7500 series delivers up to 20x2 greater performance per server over 4-socket single-core servers, enabling up to 20:1 server consolidation3 up to 90 percent3 lower operating costs, and an estimated return on investment in as little as one year.3

Maximizing Your Data Center Resources and Meeting Changing Requirements with Ease

With up to 8x the memory bandwidth4 and integrated virtualization support, the Intel Xeon processor 7500 series helps you keep up by optimizing server productivity and efficiency, and supports more virtual machines per server. On an eight-socket platform processing up to 128 threads simultaneously, you can use industry-leading virtualization performance to help maximize the resources of your data center and keep your data center flexible and able to respond to changing business priorities. Servers powered by the Intel Xeon processor 7500 series deliver up to 3.7x percent better virtualization performance5 allowing you to run the most demanding applications while still maintaining the peak load responsiveness needed for the unpredictability of virtualized applications. And with the reliability and scalability of the Intel Xeon processor 7500 series, you can use virtualized machines to ensure business continuity and disaster-recovery objectives are met with ease.

Meeting Mission-Critical Requirements and Reducing Your RISC

Servers built on the Intel Xeon processor 7500 series feature Intel® Machine Check Architecture Recovery which provides automatic detection, isolation and recovery from many types of errors. The Intel Xeon processor 7500 series also provides many new reliability features including SMI lane failover and QPI self-healing which enable the platform to identify problems and fail over or modify itself to keep running. In essence, it delivers everything you need to maintain data integrity, minimize downtime, and maximize productivity. Built to handle your most processor-intensive, mission-critical applications, the Intel Xeon processor 7500 series provides a cost-effective alternative to expensive, proprietary RISC-processor-based systems.
For more information on the Intel Xeon processor, visit [www.intel.com/xeon](http://www.intel.com/xeon).

### Intel® Xeon® Processor 7500 Series Overview

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<td><strong>8-Core Processing</strong></td>
<td>• Up to 8 cores and 16 threads per socket with Intel® Hyper-Threading Technology, the Intel® Xeon® processor 7500 series offers increased performance with 45nm manufacturing technology and increased headroom for multi-threaded applications and data-demanding applications.</td>
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<td><strong>Next-Generation Intel® Microarchitecture (Nehalem)</strong></td>
<td>• Boosts performance on multiple applications/user environments and data-demanding workloads, while enabling denser data center deployments through improved performance-per-watt. • 45nm Hi-K process technology enables larger on-die cache for better performance, and reduced transistor gate leakage for greater energy efficiency.</td>
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<td><strong>24 MB of L3 Cache</strong></td>
<td>• Increases efficiency of cache-to-cache data transfers, maximizing main memory-to-processor bandwidth. • Reduces latency by storing larger data sets closer to the processor, reducing the number of trips to main memory.</td>
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<td><strong>Intel® QuickPath Interconnect</strong></td>
<td>• High-speed (up to 25.6 GB/s), point-to-point connections between processors, and between processors and the V0 Hub. • Enables scaling of processors from 2- to 8-sockets, and higher with use of third-party node controllers.</td>
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<td><strong>Quad Channel Integrated Memory Controller</strong></td>
<td>• Up to 1 Terabyte of memory with 16 GB DIMMs in a 4-socket system (up to 2 terabytes in an 8-socket system). • Intel® Scalable Memory Interconnect results in up to 8x the memory bandwidth of prior generations. • Intel Scalable Memory Buffers are used to achieve the highest memory capacity per socket for an X86 architecture. • Up to 16 memory DIMM slots per processor socket. • Support for up to 16 GB DDR3 DIMMs.</td>
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<td><strong>Advanced Reliability Features</strong></td>
<td>• Intel® Machine Check Architecture Recovery lets the operating system continue running even after otherwise uncorrectable errors are detected. • SMI lane failover and QPI self-healing boost availability through automatic interconnect error detection and recovery.</td>
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<td><strong>Intel® Virtualization Technology†</strong></td>
<td>• A suite of processor hardware enhancements that assists virtualization software to deliver more efficient virtualization solutions and greater capabilities including 64-bit guest OS support. • Intel® VT FlexPriority optimizes virtualization software efficiency by improving interrupt handling. • Intel® VT FlexMigration enables Intel Xeon processor 7500 series-based systems to be added to the existing virtualization pool with single, two- or 4-socket Intel-based servers.</td>
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<td><strong>Intel® 64 Architecture‡</strong></td>
<td>• Flexibility for 64-bit and 32-bit applications and operating systems.</td>
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Intel processor numbers do not measure performance. Processor numbers differentiate features within each processor family, not across different processor families. See www.intel.com/products/processor_number for details. 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 enabled software update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

Hyper-Threading Technology requires a computer system with a processor supporting Hyper-Threading Technology and an HT Technology enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware and software you use. See www.intel.com/uk/hyperthreading for more information including details on which processors support HT Technology.

64-bit computing on an Intel architecture computer 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. Consult with your system vendor for more information.

Intel® 64 Architecture‡

- Intel® 64 Architecture is a family of processor microarchitectures joining benefits of Intel® 64 Technology and Intel® Transactional Synchronization Extensions (TSE) making it possible to deliver performance and efficiency improvements.

- Intel® 64 Technology is a set of architectural and microarchitectural improvements supporting Intel® 64 Architecture that deliver increased performance and efficiency on applications that use the 64-bit addressing and other features of Intel® 64 Technology.

- Intel® 64 Technology includes the following features:
  - Increases efficiency of cache-to-cache data transfers, maximizing main memory-to-processor bandwidth.
  - Intel® Machine Check Architecture Recovery lets the operating system continue running even after otherwise uncorrectable errors are detected.
  - Intel® VT FlexPriority optimizes virtualization software efficiency by improving interrupt handling.
  - Intel® VT FlexMigration enables Intel Xeon processor 7500 series-based systems to be added to the existing virtualization pool with single, two- or 4-socket Intel-based servers.
  - Flexibility for 64-bit and 32-bit applications and operating systems.

Intel Intel® Xeon® Processor 7500 Series Overview

- **Up to 8 cores and 16 threads per socket with Intel® Hyper-Threading Technology,** the Intel® Xeon® processor 7500 series offers increased performance with 45nm manufacturing technology and increased headroom for multi-threaded applications and data-demanding applications.

- **Boosts performance on multiple applications/user environments and data-demanding workloads,** while enabling denser data center deployments through improved performance-per-watt.

- **45nm Hi-K process technology enables larger on-die cache for better performance,** and reduced transistor gate leakage for greater energy efficiency.

- **Increases efficiency of cache-to-cache data transfers,** maximizing main memory-to-processor bandwidth.

- **Reduces latency by storing larger data sets closer to the processor,** reducing the number of trips to main memory.

- **High-speed (up to 25.6 GB/s), point-to-point connections between processors,** and between processors and the V0 Hub.

- **Enables scaling of processors from 2- to 8-sockets,** and higher with use of third-party node controllers.

- **Up to 1 Terabyte of memory with 16 GB DIMMs in a 4-socket system (up to 2 terabytes in an 8-socket system).**

- **Intel® Scalable Memory Interconnect results in up to 8x the memory bandwidth of prior generations.**

- **Intel Scalable Memory Buffers are used to achieve the highest memory capacity per socket for an X86 architecture.**

- **Up to 16 memory DIMM slots per processor socket.**

- **Support for up to 16 GB DDR3 DIMMs.**

- **Intel® Machine Check Architecture Recovery lets the operating system continue running even after otherwise uncorrectable errors are detected.**

- **SMI lane failover and QPI self-healing boost availability through automatic interconnect error detection and recovery.**

- **A suite of processor hardware enhancements that assists virtualization software to deliver more efficient virtualization solutions and greater capabilities including 64-bit guest OS support.**

- **Intel® VT FlexPriority optimizes virtualization software efficiency by improving interrupt handling.**

- **Intel® VT FlexMigration enables Intel Xeon processor 7500 series-based systems to be added to the existing virtualization pool with single, two- or 4-socket Intel-based servers.**

- **Flexibility for 64-bit and 32-bit applications and operating systems.**

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