



Intel® Xeon™ Processor-based Servers:

Performance, headroom, and versatility for front-end applications, small-business servers, and High-Performance Computing



Innovative Technologies Help You Do More

You need server solutions that offer performance, reliability, versatility, and low ownership costs. Dual-processor (DP) servers based on Intel® Xeon™ processors deliver all this and more, at a variety of price-points.

The Intel Xeon processor family provides the processing power and versatility required for front-end servers and small-business (SMB) servers as well as for High-Performance Computing (HPC). The latest Intel Xeon processors significantly improve the compute power and the response time for your Internet applications, mail servers, small databases, and technical computing applications. These processors, coupled with large integrated cache, feature the Intel® NetBurst® microarchitecture and Hyper-Threading Technology to further improve processor response and reaction times, enabling support for greater numbers of simultaneous users and transactions.

Target Applications¹

Intel Xeon processor-based servers offer compelling value for applications such as Web caching, multi-user applications, SMB servers, HPC servers, and more.

Server Type	Application Category	Application Software Examples
Front-end servers, Internet infrastructure	Cache/Web	Microsoft ISS*, Apache
	Directory	Microsoft Active Directory*
	Security infrastructure	RSA BSAFE*/SSL-C*, Symantec Norton AV*/Enterprise Firewall*, Microsoft Crypto Library*, Network Associates*, McAfee*, Verisign PKI*
Application servers	Messaging (small-business and departmental)	Lotus, Microsoft Exchange*
	e-Commerce, e-Business, Customer Relationship Management (CRM)	Adobe Altercast*, Ariba Buyer*, CA CleyerPath*, Interwoven TeamSite*, Microsoft Commerce Server*, Pivotal, Reuters Plus*, SunGard AddVantage*
Enterprise management	Collaboration	PTC Windchill*, UGS Teamcenter*, Microsoft Exchange Server*
	System management, Storage management	Veritas ServPoint*, BMC Patrol*
Databases	Database (small-business and departmental data)	Microsoft SQL Server*
High-Performance Computing		OSCAR*, SCYLD*, SCore*

Packed with Performance Boosters

Large Integrated Cache

The Intel Xeon processor family is available with three integrated cache sizes: 512KB, 1MB, and 2MB. A large integrated cache means that more data can be stored closer to the execution units in the processor for faster access to needed data, resulting in higher system throughput and shorter turnaround times. The 512KB version is targeted for the mainstream DP server user, whereas the 1MB version is intended for the performance DP server market. A server based on the larger 2MB integrated cache version can further increase Java server performance by up to 16 percent or HPC applications by up to 20 percent².

The Intel® NetBurst® Microarchitecture

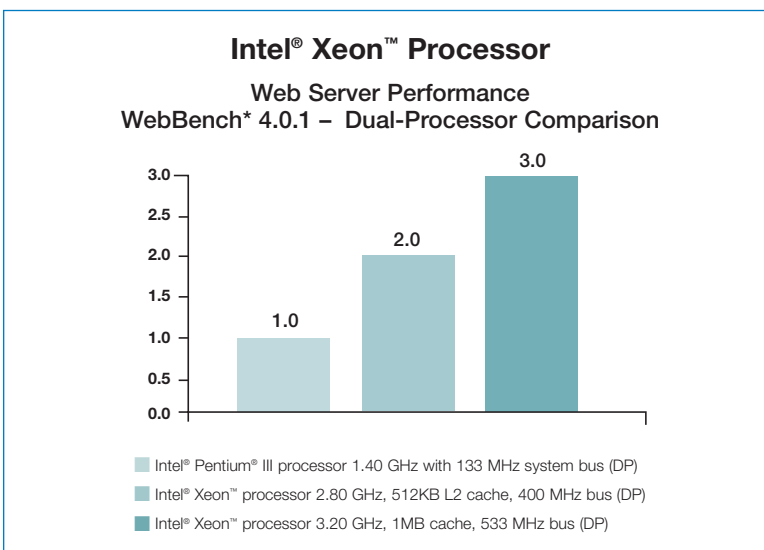
The Intel NetBurst microarchitecture provides innovative techniques that enhance processor execution such as higher core frequencies, a Rapid Execution Engine, and Advanced Dynamic Execution. The pipeline depth in the processor is doubled, allowing the processor to reach much higher core frequencies.

Hyper-Threading Technology

Hyper-Threading Technology executes more than one thread on the same processor to provide enhanced performance on multithreading applications. This provides immediate benefits for today's business applications by:

- Increasing the number of transactions that can be processed
- Enabling support for more users, thereby improving business productivity
- Providing faster response times for Web sites, HPC and e-Business applications, thereby enhancing your customers' experience

Outstanding Performance Across All Applications²



System Configurations

- Dual Intel® Pentium® III processor 1.40 GHz with 512KB L2 cache, ServerWorks Enterprise Serverset® III HE-SL chipset-based server board, 3GB PC133 SDRAM, Microsoft Windows® 2003, Intel® PRO/1000 Gigabit Server adapter, AMI Series 471 Rev C2 RAID controller*, Dell PowerVault® 220S disk array.
- Dual Intel® Xeon™ processor 2.80 GHz with 512KB L2 cache, Intel® Server Board SE7501WV2 with Intel® E7500 chipset, 3GB DDR, Microsoft Windows® 2003, Intel® PRO/1000 Gigabit Server adapter, AMI Series 471 Rev C2 RAID controller*, Dell PowerVault® 220S disk array.
- Dual Intel® Xeon™ processor 3.20 GHz with 1MB L3 cache, Intel® Server Board SE7501WV2 with Intel® E7501 chipset, 3GB DDR, Microsoft Windows® 2003, Intel® PRO/1000 Gigabit Server adapter, AMI Series 471 Rev C2 RAID controller*, Dell PowerVault® 220S disk array.

Source: Veritest* Labs (October 6, 2003).

The Intel Xeon processor 3.20 GHz with 1MB cache:

- Can process up to three times more Web requests per second than servers based on the Intel® Pentium® III processor
- Supports more than twice the Java operations per second than servers based on the Intel Pentium III processor
- Supports nearly twice the number of e-mail clients relative to servers based on the Intel Pentium III processor
- Supports more than twice the number of media users relative to servers based on the Intel Pentium III processor
- Offers cost-effective performance for price-driven HPC environments

Intel Xeon processor-based platforms also offer features beneficial in HPC applications:

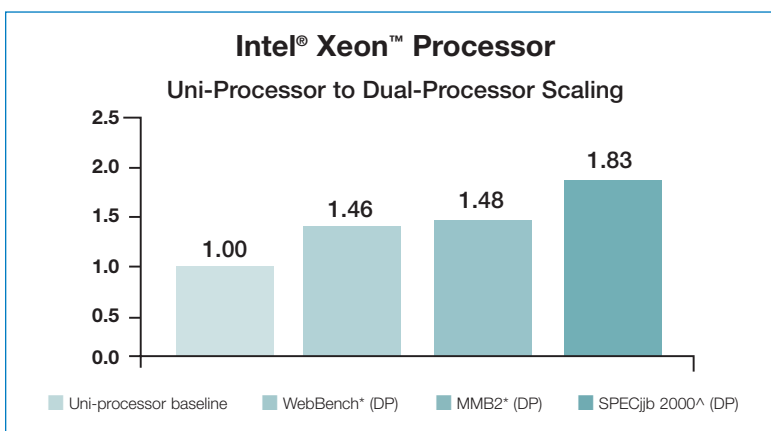
- 32 bits of addressable memory
- Large 20-stage pipeline that provides increased throughput from instruction-level parallelism (ILP)
- Power for applications containing mostly integer calculations
- Large integrated cache
- Superior floating-point performance

Plenty of Headroom for Peak Workloads

To accommodate anticipated and unexpected peaks in server workloads, you need to build headroom into your IT infrastructure. Customers, associates, and employees can use your servers to purchase products, look for information, conduct business, and access e-mail at any time, from anywhere.

The most cost-effective way to achieve headroom is to purchase fully populated DP servers. A fully populated DP server based on the Intel Xeon processor 3.20 GHz with 1MB cache can process significantly more simultaneous requests than the same server with one processor.

Intel® Xeon™ Processor Relative UP-DP Scaling Performance



Source: Veritest* Labs (October 6, 2003).

System Configurations

Uni-processor configuration

Intel® Xeon™ processor 3.20 GHz with 1MB L3 cache, Intel® Server Board SE7501WW2 with Intel® E7501 chipset, 3GB DDR, Microsoft Windows* 2000 Server SP2, Intel® PRO/1000 Gigabit Server adapter, AMI Series 471 Rev C2 RAID Controller*, Dell PowerVault* 220S disk array.

Dual-processor configurations

Intel® Xeon™ processor 3.20 GHz with 1MB L3 cache, Intel® Server Board SE7501WW2 with Intel® E7501 chipset, 3GB DDR, Microsoft Windows* 2000 Server SP2, Intel® PRO/1000 Gigabit Server adapter, AMI Series 471 Rev C2 RAID controller*, Dell PowerVault* 220S disk array.

^ For the uni- and dual-processor SPECjbb data, generation, BEA WebLogic* JRockit* 8.1 JVM is included in the system configuration.

Intel® Xeon™ Processor Family

Features

- 512KB cache: 3.06, 2.80, 2.66, 2.40 and 2 GHz
- 1MB cache: 3.20, 3.06, 2.80 and 2.40 GHz
- 2MB cache: 3.20 GHz only

Integrated cache

Pipelining technology

System bus (533 MHz)

Hyper-Threading Technology

Rapid Execution Engine

Streaming SIMD Extensions – 2 (SSE2)

Advanced Transfer Cache

Execution Trace Cache

Benefits

- Broad processor family that meets the needs of wide range of server applications

- Speeds the delivery of data and instructions to processor core
- Produces faster response times, increased support for more users, and enhanced scalability

- Improves performance and increases frequency of the processor

- Up to 4.3 GB/s system bus bandwidth for rapid data throughput

- Increases the number of transactions that can be processed for the enterprise
- Enables support for more users, improving business productivity
- Provides faster response times for many Internet and e-Business applications, enhancing your customers' experience

- Improves performance by running Arithmetic Logic Units (ALUs) at up to twice their usual speed

- Boosts response times by executing tasks with fewer instructions

- Tightly synchronized with the L1 cache and Rapid Execution Engine for fast access to server data

- Improves throughput and reduces latency
- Provides innovative cache access techniques, reducing access latency for the Rapid Execution Engine

Intel® E7501 Chipset

All Intel® Xeon™ processors are compatible with the existing Intel® E7501 chipset. This chipset is optimized for the Intel Xeon processor family and supports DP-based server platforms by delivering maximized system bus, memory, and I/O bandwidth to enhance performance, scalability, and end-user productivity.

Features	Benefits
533 MHz System Bus	Supports a maximum bandwidth of 4.3GB/s when accessing memory and I/O devices
Dual-Channel DDR-266 Memory Interface	Offers a maximum memory bandwidth of 4.3GB/s through a 144-bit wide, 266 MHz dual data rate SDRAM memory interface supporting a maximum of 16GB of memory
Intel® Hub Architecture 2.0 Connection	As many as three Intel 82870P2 Controller Hub devices can be attached to the MCH, each to the Memory Controller Hub (MCH) providing more than 1GB/s of I/O bandwidth. ECC, coupled with high data transfer rates, supports I/O segments with greater reliability and faster access to high-speed networks
Intel® 82870P2 Controller Hub	Delivers next-generation PCI/PCI-X performance and significantly enhances platform flexibility. Two independent 64-bit, 133 MHz PCI-X segments and two hot-plug controllers (one per segment) for each Intel® 82870P2 allow up to six PCI-X buses per system
Advanced Platform Reliability, Availability, Serviceability, Usability, and Manageability (RASUM)	Features such as memory ECC with Intel® x4 Single Device Data Correction ³ , hardware memory scrubbing, MCH SMBus target interface, hub interface ECC, and enhanced error status information maintained through reset yield a more reliable platform

Boxed Processors

Intel also offers boxed Intel Xeon processors, which provide Intel-designed thermal solutions and a three-year limited warranty. For more information, visit the Intel® Reseller Center at: <http://intel.com/reseller>, or contact your Intel sales representative or Intel authorized distributor.

For More Information

Contact your Intel® products representative to discover how Intel Xeon processor-based servers can enhance your business productivity. Or, visit the Intel® Business Computing site at: www.intel.com/eBusiness

¹ This list consists of examples of applications intended to run on dual-processor (DP)-based systems for departmental and SMB workloads. For larger workloads, use multiprocessor (MP) Intel® Xeon™ processors in four-way and higher configurations.

² For the latest Intel® Xeon™ processor performance details, please refer to http://www.intel.com/products/server/processors/server/xeon/index.htm?id=ipp_srvr+proc_xeonwrkstn& and select the "Intel processor performance benchmarks" link in the "Tools" box.

³ In an x4 DDR memory device, the Intel® x4 Single Device Data Correction (x4 SDDC) provides error detection and correction for 1, 2, 3 or 4 data bits within that single device and provides error detection, up to 8 data bits, within two devices.

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