



Quad-Core Intel® Xeon® Processor-based Platforms



A woman with long, wavy brown hair is looking back over her right shoulder towards the camera. She is wearing a light-colored, possibly white or cream, top. The background is a blurred office environment with green plants and a man in a dark shirt and glasses visible in the background on the left. The lighting is soft and focused on the woman.

Impact Far Beyond the Data Center

Your business, your customers and your competitors don't stand still. Neither does technology. It is constantly advancing and improving, presenting new benefits and new possibilities across industries. At the same time, the variety and complexity of technologies make it essential that you choose them carefully – in order to ensure that your business' flexibility and productivity are maximized while the risks and costs are minimized. And because your information technology is central to all business operations, your organization's future hangs in the balance: how well you can reduce costs, increase returns on assets, enhance productivity, strengthen customer relationships, respond to competitive challenges and create what your customers want to buy.

A Technology Decision That Defines Your Future

There are a small number of technology decisions that can truly define your future – the business possibilities and performance going forward. The introduction of Quad-Core Intel® Xeon® processor 7300¹ series-based systems represents one of those opportunities.

Far more than just “fast servers,” a technology infrastructure built with Intel Xeon processor 7300 series-based platforms improves your return on IT assets while enabling entirely new business possibilities. Based on the advanced Intel® Core™ micro-architecture and built with complementary advanced technologies, quad-core servers comprise a powerful, flexible, efficient, and cost-effective fabric that not only delivers value in the data center, but forms a powerful pivot around which you gain new business advantages by doing things you couldn’t do before:

- Reach customers in new ways while strengthening relationships
- Design more complex products and services faster
- Transform supply chains to be much more responsive and efficient
- Know sooner, decide better and act faster in the most complex, fast-paced environments
- Increase productivity and collaboration internally and with your partners

In short, the business capabilities and innovations enabled by multi-core Intel Xeon processor-based infrastructure can help make your company more efficient, responsive, and competitive.

A data center based on quad-core processor-based systems is fundamentally advanced, combining multiple synergistic capabilities. Based on industry standards that connect you to the largest network of hardware, software and solution providers – Intel lets you maximize your choices, driving your costs down and giving you access to constant innovation and advances. And, Quad-Core Intel Xeon processor-based systems are offered at comparable prices to dual-core systems, enabling IT to do more with less, and providing your company with affordable, available platforms for data-demanding enterprise applications and server consolidation in virtualized environments.

Companies like yours are capitalizing on the power of quad-core now – the question is, will you?

Quadrupling Business Innovation

Intel continues to build more capabilities into platforms so you can do much more. Between November 2006 and June 2007, Intel shipped more than one million quad-core server processors. Now quad-core is available in all Intel Xeon processor based servers, from entry 1-socket to expandable 32-socket servers, allowing you to optimize your infrastructure to deliver the right business services more efficiently. Quad-Core Intel Xeon processors 7300 series have up to 2.44x the performance of Dual-Core Intel Xeon processors at comparable mainstream pricing.²

Fundamental business solutions that allow IT to increase performance and efficiency. Powerful and affordable 2-socket Quad-Core Intel Xeon processor-based servers deliver new levels of performance for core business processes, across not just a few but a wide range of business workloads, including application servers, e-mail servers, Web servers and more.

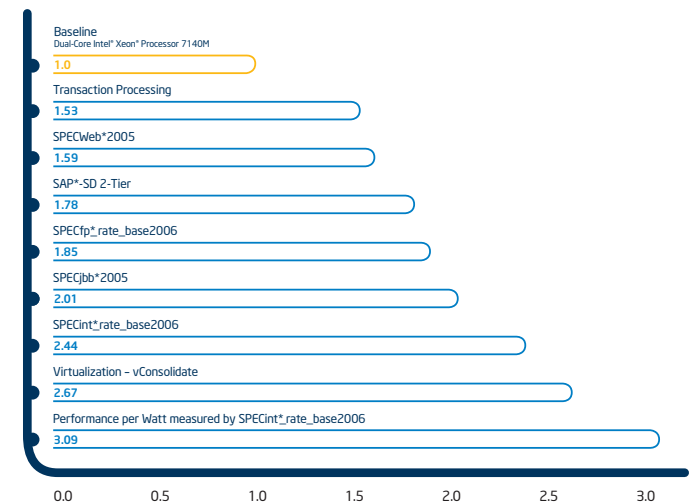
Some applications in IT and business environments such as server consolidation, database, enterprise resource planning, or business intelligence simply require more reliable and more powerful computing capabilities because of their importance and peak period demands. In these circumstances, scalable 4-socket (or higher) servers with more memory and I/O support are ideal solutions. Uniquely architected for data-demanding applications, virtualization and server consolidation, newer quad-core, 4-socket Intel processor-based servers outperform the leading dual-core servers and provide exceptional performance scaling over smaller 2-socket servers.

Supply chain management solutions that turn traditional supply chains into sense-and-respond demand chains and increase collaboration with suppliers and customers. Quad-Core Intel Xeon processor 7300 series-based servers outperform dual-core offerings based on Intel Xeon processor 7100¹ series by more than 78% for Enterprise Resource Planning applications.³

Enterprise resource planning (ERP) tools that use real-time data from multiple sources and applications to improve decision making and efficiency. Intel Xeon processor-based servers have industry-leading reliability features that protect your business processes from downtime and help ensure you have the information you need when you need it. And preventing downtime also saves significant cost – up to \$2 million per hour, depending on the industry.

Data analytics and business intelligence tools that turn data into business advantage faster and allow analysis of larger data sets. Quad-Core Intel Xeon processor 7300 series-based servers

Server Performance, Performance Per Watt and Virtualization for the new Quad-Core Intel® Xeon® processor 7300 Series



outperform dual-core offerings based on Intel Xeon processor 7100 series on transaction-intensive applications by up to 53% as measured by the Transaction processing benchmark.⁴

Built for scalability and responsiveness: Whenever peak workload performance is needed, consider the latest 4-socket, quad-core servers. Featuring up to 86% more performance than smaller 2-socket alternatives, these servers are ready for whatever you want to throw at them.⁵

For unrivaled multi-tasking capability, faster running server applications and more efficient, more cost-effective computing, four cores are better than two. With quad-core server technology from Intel, you can have it all:

- Increased performance at the same CPU cost.
- Increased performance in the same power envelope.

Building Your New Business Capabilities

Quad-Core Intel Xeon processor-based systems deliver four key capabilities to your business:

Significantly higher performance: Intel Xeon processor-based servers provide 64-bit performance with the broadest 32-bit application support. In fact, Quad-Core Intel Xeon processor-based platforms deliver breakthrough performance with better power efficiency, delivering more than 2x the performance and more than 3x the performance per watt compared to leading Dual-Core Intel Xeon processor-based servers.² By driving your data- and transaction-intensive applications faster, your business can know more, know it faster and respond better. You can deploy increasingly powerful business tools to track your marketplace and identify previously hidden opportunities.

Flexibility to adapt: Virtualization is a technology that allows one server to act like many and squeezes more usage out of each server – increasing your computing performance and available resources without increasing your cost. Heralded by industry analysts as a significant technology enhancement, Intel® Virtualization Technology⁶ (Intel® VT) comes standard on dual- and quad-core based servers. Intel VT works by hardware assisting your virtualization environment and, in combination with powerful, more reliable servers, boosts asset utilization and IT flexibility while reducing costs and data center power consumption. Because the newest 4-socket Intel Xeon processor-based servers (Quad-Core 7300 and Dual-Core 7200¹ series) use the same Intel Core microarchitecture as existing 1- and 2-socket Intel Xeon processor-based servers (Quad-Core Xeon 5300¹ and 3200,¹ Dual-Core 5100¹ and 3000¹ series), you have the ability to build one pool of virtualization-compatible quad-core and dual-core servers and conduct live VM migration between them, offering tremendous flexibility for fail-over, load balancing and disaster recovery scenarios. And thanks to a new feature called Intel® VT

FlexMigration, IT also will have the capability to add future Intel Xeon processor-based systems to that same resource pool when utilizing future versions of virtualization software. This gives you the power to choose the right server platform today to best optimize performance, cost, power and reliability for their application, without risking future trade-offs or technology dead ends.

Ready for growth: A technology infrastructure based on multi-core Intel Xeon processor-based systems is modular, allowing you to expand your capabilities smoothly and cost effectively as conditions warrant. The Intel Core microarchitecture platform supports both dual-core and quad-core processors, offering scalability up to 32 processor systems, and because they're standards-based, and nearly 40 million Intel® processor-based servers have shipped since 1996, you benefit from a huge ecosystem of providers – software vendors, hardware manufacturers and solution providers – all striving to deliver continually improving solutions to your specific business challenges. The result: the choices and tools available to your business constantly grow and improve, helping to ensure your continued business advantage.

Continuing leverage from Intel advances: Intel is continually advancing the technology that runs your business – with greater performance, increased energy efficiencies and real-world expertise on how to use technology to gain business advantage. Building your business on multi-core Intel Xeon processor-based systems means the capabilities of your technology foundation can advance over time and keep pace with your innovation.

All of these advantages help you enhance your competitiveness with greater agility and responsiveness, increased customer satisfaction, higher sales and improved margins.



The Technology That Underlies Your Business Advantage

Intel Core microarchitecture-based systems are the latest examples of how Intel's proven leadership can drive your business capabilities to the next level.

64-bit Processing⁷: Optimizes processing capacity with two or four complete processing units on one chip and supports both 32-bit and advanced 64-bit applications on the same server, allowing your business to smoothly migrate to 64-bit solutions.

Large Cache: With up to 8 MB of on-die L2 Cache per processor,⁸ you can spend more time processing data vs. looking for it. Large data demanding workloads love large cache memory, allowing applications to store data and instruction sets closer to the processor, enabling your application to go out to memory less often which makes for overall better system performance.

Breakthrough Energy-efficient Performance: With all the latest multi-core Intel Xeon processors built on Intel Core microarchitecture, your data center can capitalize on industry-leading performance with low CPU power consumption. Intel's 65 nanometer manufacturing technology combined with our unique Intel® Demand-Based Switching (DBS) – which reduces processor power consumption when utilization is low – allows Intel Xeon processor-based systems to deliver the leading performance per watt.

Expanded Memory Capabilities: Fully Buffered DIMM (FBDIMM) technology proactively protects data and improves security through advanced redundancy and error checking features. Additionally, FBDIMM expands memory capacity while simultaneously allowing better memory bandwidth to meet the demands of business intelligence, database and other compute-intensive applications. Intel 2P servers offer memory support up to 64 GB and now the newer 4P systems offer 32 memory slots and support for up to 256 GB of memory on a single enterprise server.

Intel® I/O Acceleration Technology (Intel® I/OAT): A new and unique Intel® platform technology that improves network responsiveness by getting network data to applications faster and reducing server system overhead. Implementing Intel I/OAT enables better application responsiveness without requiring changes to a business's existing network or security configurations.

Data Traffic Optimizations: The latest Quad-Core Intel Xeon processor 7300 series-based servers offer data traffic optimizations that speed up traffic within the platform and reduce system overhead. Coupled together with Intel Core microarchitecture, data traffic optimization enables better application responsiveness, virtualization performance, and the headroom for data-demanding enterprise applications.





Removing Today's Business Bottlenecks

In addition to driving new capabilities for your business, Intel Xeon processor-based systems help avoid bottlenecks and challenges in your technology infrastructure.

Significantly lower power consumption and cost: Systems based on the advanced Intel Core microarchitecture deliver outstanding energy-efficient performance – saving energy and lowering your operating costs. Both quad-core and dual-core platforms are built for virtualization. Our latest quad-core platforms offer more VM headroom with 2x cores and 4x memory capacity compared with previous generations and enable the largest consolidation ratios of any Intel Xeon platform, delivering additional energy cost savings by deploying and powering fewer servers overall. Coupled with Demand-Based Switching (DBS) and Enhanced Intel SpeedStep® Technology,³ these capabilities mean significant savings on energy costs and over hundreds or thousands of servers – the total savings become substantial.

Increased return on assets: By doing more with your servers and operating them more cost effectively, you increase your return on IT assets. But even more importantly, the new business tools and processes made possible by your Intel Xeon processor-

based server environment enables a greater return on your people, expertise and competitive differentiators. This provides an ideal foundation for IT standardization – enabling lower maintenance costs through reduced complexity over time.

Unmatched reliability and scalable performance: Quad-Core Intel Xeon processor-based systems are built with more server reliability features than competitive offerings, giving you the increased uptime your business demands. These platforms offer scalable performance with more than 5x performance gains over Intel's fastest single-core Intel Xeon MP and 2x performance improvement over previous-generation Dual-Core Intel Xeon processor-based servers.² New 50W quad-core processor options enable extreme energy efficiency ideal for ultra dense rack and blade deployments using either 2P or 4P server systems. We can also offer standard configurations with large memory footprints and scalability up to 32-way.

By transforming the capabilities of your technology foundation and improving traditional bottlenecks, multi-core Intel Xeon processor-based servers increase the resources and attention you can give to your business. Less downtime, less cost, less disruption, less distraction – allowing you to focus on your strategic challenges.

Performance Per Watt Comparison using SPECint*_rate_base2006 benchmark: SPECint*_rate_base2006 is a compute-intensive benchmark that measures the integer throughput performance of a computer system carrying out a number of parallel tasks. Performance Per Watt calculated by dividing the performance by the measured average power during the performance window.

Configuration Details: Results published by Principled Technologies, Inc. at <http://principledtechnologies.com/clients/reports/Intel/E7340SPECint0907.pdf> as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: Intel® SR4850HW4x Server Platform with four Intel Xeon processors 7140M 3.4GHz, 8 cores, 16MB L3 cache, 16GB memory PC2-5300 DDR2, disk Seagate® 1x146GB 15krpm SCSI, Microsoft Windows Server® 2003 Enterprise x64 Edition, SPEC binaries built with Intel Compiler 10.0.

Quad-Core Intel® Xeon® Processor E7340-based platform details: Intel S7000FC4UR Server Platform with four Intel Xeon processors E7340 2.4GHz, 16 cores, 2x4MB L2 cache, 16GB memory PC2-5300 FB-DDR2, disk Seagate 1x73GB 10krpm SAS, Microsoft Windows Server 2003 Enterprise x64 Edition, SPEC binaries built with Intel Compiler 10.0.

Performance Per Watt Comparison using SPECjbb2005 benchmark: SPECjbb2005 (SPEC Java Business Benchmark 2005) benchmark description: Written in Java, this multi-threaded benchmark emulates an order processing environment in a company with multiple warehouses serving multiple customers. Measures average transaction throughput of a heavily loaded server. Performance reported in Business Operations per Second (BOPS). Performance Per Watt calculated by dividing the performance by the measured average power during the performance window.

Configuration Details: Data Source: Published/measured results as of August 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® Processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, 16 GB (16x1GB) 667MHz FB-DIMM memory, Microsoft Windows Server 2003 Enterprise x64 Edition, BEA JRockit® 5.0 P27.2.0.

Quad-Core Intel® Xeon® Processor X7350-based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® Processor J7345, 1.86 GHz with 2x4M L2 Cache, 1066 MHz system bus, 16 GB (16x1GB) 667MHz FB-DIMM memory, Microsoft Windows Server 2003 Enterprise x64 Edition, BEA JRockit® 5.0 P27.2.0.

Benchmark Description for vConsolidate*: vConsolidate is a benchmark developed by Intel Corporation to measure Server Consolidation performance. This benchmark represents predominant use case of server application consolidation. Application types (web, database, mail, java) selected for consolidation are guided by market data. Benchmark scales through CSUs (Consolidated Stack Unit). One CSU = 5 virtual machines (4 application virtual machines and 1 idle virtual machine).

Configuration Details: Performance measurement conducted by Virtual Iron and Intel Corporation as of August 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: Intel Server Platform with four Dual-Core Intel Xeon processors 7140M 3.4GHz, 800 MHz system bus, 16MB L3 cache, Intel® E8500 chipset, 32GB memory DDR2 PC2-5300P, 14x Seagate® Cheetha® 36GB 15krpm Fibre Channel HDD, vConsolidate workload beta 2, Virtual Iron 4.0, profile 3. Maximum performance achieved using 2 CSUs.

Quad-Core Intel® Xeon® Processor X7350-based platform details: Intel Server Platform with four Quad-Core Intel Xeon processors X7350 2.93GHz, 1066 MHz system bus, 8MB L2 cache, ClarkBros chipset, 32GB memory FBD PC2-5300F, 14x Seagate Cheetha 36GB 15krpm Fibre Channel HDD, vConsolidate workload beta 2, Virtual Iron 4.0, profile 3. Maximum performance achieved using 4 CSUs.

Benchmark description for SPECint*_rate_base2006 benchmark: SPECint*_rate_base2006 is a compute-intensive benchmark that measures the integer throughput performance of a computer system carrying out a number of parallel tasks.

Configuration details for SPECint_rate_base2006: Comparison based on published/submitted results to www.spec.org as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: Fujitsu Siemens® PRIMERGY® RX600 S3 platform with four Intel Xeon processors 7140M 3.4GHz, 16MB L3 cache, 32GB memory PC2-3200R ECC, disk Fujitsu® SCSI 73GB 15krpm, 64-Bit SUSE® Linux® Enterprise Server 10 kernel 2.6.16.21-0.8-mp on an x86_64, Intel® C++ Compiler for IA32/EM64T application Version 9.1. Referenced as published at 75.5(SPECint*_rate_base2006) and 80.6(SPECint_rate2006). For more information see <http://www.spec.org/cpu2006/results/res2007q2/cpu2006-20070402-00725.html>.

Quad-Core Intel® Xeon® Processor X7350-based platform details: IBM® System x3850 M2 Server platform with four Quad-Core Intel Xeon processors X7350 2.93GHz, 2x4M L2 cache, 16 x 4GB DDR2-PC5300, 64-Bit SUSE Linux Enterprise Server 10 SP1 Kernel Linux, Intel C++ Compiler for Linux32 and Linux64 Version 10.1 Build 20070725. Results submitted to www.spec.org as of Sept 4th 2007 at 184(SPECint_rate_base2006).

Benchmark description for SPECjbb2005: SPEC Java Business Benchmark 2005 (jbb2005), written in Java, this multi-threaded benchmark emulates an order processing environment in a company with multiple warehouses serving multiple customers. Measures average transaction throughput of a heavily loaded server. Performance reported in Business Operations per Second (BOPS).

Configuration details for SPECjbb2005: Comparison based on published/submitted results to www.spec.org as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: HP® ProLiant® ML570 G4 platform with four Dual-Core Intel Xeon processors 7140M 3.4GHz, 16MB L3 cache, 32GB memory PC2-3200, Microsoft Windows Server® 2003 R2 Enterprise x64 Edition with SP1, BEA® JRockit® 5.0 P27.1.0 (build P27.1.0-7-17488-1.5_08-20061103-1228-windows-x86_64). Measured at 217,334 bops and 54,334 bops/JVM. For more information see <http://www.spec.org/jbb2005/results/res2006q4/jbb2005-20061121-00222.html>.

Quad-Core Intel® Xeon® Processor X7350-based platform details: Fujitsu Siemens® PRIMERGY® RX600 S4 platform with four Quad-Core Intel Xeon processors X7350 2.93GHz, 2x4MB L2 cache, 16GB memory (16x4GB), Microsoft Windows Server 2003 Enterprise x64 Edition SP1, BEA® JRockit® 6.0 P27.4.0 (build P27.4.0-3-86647-1.6.0_02-20070801-1931-windows-x86_64). Result submitted to www.spec.org for review as of September 5, 2007 at 437,412 bops and 54,677 bops/JVM.

Benchmark Description for SPECfp*_rate_base2006: SPECfp*_rate_base2006 is a compute-intensive benchmark that measures the floating point throughput performance of a computer system carrying out a number of parallel tasks.

Configuration Details for SPECfp*_rate_base2006: Published/submitted results to www.spec.org as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® Processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, 16GB (16x1GB) memory, 64-Bit SUSE LINUX Enterprise Server 10, Kernel. SPEC binaries built with Intel C++ Compiler for Linux64 version 9.1.

Quad-Core Intel® Xeon® Processor X7350-based platform details: Lenovo® R630 G7 platform with four Quad-Core Intel Xeon processors X7350 2.93GHz, 2x4MB L2 cache, 16GB memory (16x1GB Samsung® DDR2 5300F, 2 rank, CL5-5.5, ECC), disk Seagate® 1x73GB 10krpm SAS, 64-Bit SUSE LINUX Enterprise Server 10 SP1 kernel linux-cbqm 2.6.16.43-0.5-mp for x86_64, Intel C++ Compiler for Linux32 and Linux64 Version 10.1 Build 20070725. Referenced as published at 108(SPECfp_rate_base2006) and 114(SPECfp_rate2006).

Benchmark description for SAP-SD: two-tier: SAP-SD measures the performance of Enterprise resource planning servers using mySAP Business suite. It benchmark result is a measure of the number of SAP Sales and Distribution users (SAP-SD) supported by the server.

Configuration details for SAP-SD: Comparison based on published/submitted results to www.sap.com as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: HP® ProLiant® DL580 G4 platform with four Dual-Core Intel Xeon processors 7140M 3.4GHz, 2x1MB L2 cache, 16 MB L3 cache, 32GB memory, Microsoft Windows Server® 2003 Enterprise Edition (64-bit), Microsoft SQL Server® 2005 (64-bit), SAP® ECC Release 5.0 (64-bit). Referenced as published at 2,127 users. Certification 200606 (PDF 46KB).

Quad-Core Intel® Xeon® Processor X7350-based platform details: HP® ProLiant® DL580 G5 platform with four Quad-Core Intel® Xeon® processors X7350 2.93GHz, 64GB memory, Microsoft Windows Server 2003, Microsoft SQL Server 2005, SAP ECC Release 6.0. Result submitted to www.sap.com as of 9/5/2007 at 3,705 users.

Benchmark description for SPECweb2005: SPECweb2005 is the SPEC® benchmark for evaluating the performance of World Wide Web Servers. SPECweb2005 consists of three separate, distinct workloads, each with its own submetric: SPECweb2005_Banking, SPECweb2005_Ecommerce, and SPECweb2005_Support. The overall SPECweb2005 metric for a compliant result is the geometric mean of the three submetrics, normalized to a reference platform score.

Configuration details for SPECweb2005: Comparison based on published/submitted results to www.spec.org as of September 5, 2007.

Dual-Core Intel® Xeon® Processor 7140M-based platform details: HP® ProLiant® DL580 G4 platform server with four Intel Xeon processors 7140M 3.4GHz, 16MB L3 cache, 64 GB memory (16x4GB, PC2-3200 DIMMs, DDR2-400 with Advanced ECC), RedHat® Enterprise Linux® 5 (2.6.18-8e15), Rock Web Server® v1.4.0 (x86_64). Referenced as published at 18,981. For more information see <http://www.spec.org/web2005/results/res2007q2/web2005-20070409-00064.html>

Quad-Core Intel® Xeon® Processor X7350-based platform details: HP® ProLiant® DL580 G5 with four Quad-Core Intel Xeon processors X7350 2.93GHz, 2x4MB L2 Cache, 64GB (16x4GB) FB-DIMM memory, RedHat® Enterprise Linux®, Rock Web Server®, Result submitted to www.spec.org for review as of September 5, 2007 at 30,261.

Benchmark Description for Transaction Processing: This application evaluates the capacity of a database server in supporting transaction processing. It simulates execution of user transactions against a database in an order-entry environment. Performance measured in transactions per second.

Configuration Details: Data Source: Intel internal measurement, August 2007.

Dual-Core Intel® Xeon® Processor 7140M based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® Processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, Microsoft Windows 2003 Enterprise Edition.

Quad-Core Intel® Xeon® Processor X7350 based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® Processor X7350, 2.93 GHz with 2x4M L2 Cache, 1066 MHz system bus, Microsoft Windows 2003 Enterprise Edition.

Configuration details for DP to MP comparison:

Benchmark Description for SPECint*_rate_base2006: SPECint*_rate_base2006 is a compute-intensive benchmark that measures the Integer throughput performance of a computer system carrying out a number of parallel tasks.

Configuration Details for SPECint*_rate_base2006: Comparison to Quad-Core Intel® Xeon® processor X5365 based on published/submitted result as of September 5, 2007

Quad-Core Intel Xeon processor X5365 based platform details: Fujitsu Siemens® PRIMERGY® TX300 S3 with two Quad-Core Intel Xeon processors X5365 3.0 GHz, 1333 MHz system bus, 2x4MB L2 cache, memory 8GB (8x1GB) DDR2 PC2-5300F ECC, disk Seagate® ST3146854SS SAS 146GB 15krpm, SUSE® Linux® Enterprise Server 10 (x86_64) Kernel 2.6.16.21-0.8-mp, Intel® C++ Compiler for IA32/EM64T application Version 10.0. Published in July 2007. Referenced as published at 98.9. For more information see <http://www.spec.org/cpu2006/results/res2007q3/cpu2006-20070710-01408.html>

Quad-Core Intel® Xeon® processor X7350 based platform details: IBM® System x3850 M2 Server platform with four Quad-Core Intel Xeon processors X7350 2.93GHz, 2x4MB L2 cache, 16 x 4GB DDR2-PC5300, 64-Bit SUSE Linux Enterprise Server 10 SP1 Kernel Linux, Intel C++ Compiler for Linux32 and Linux64 Version 10.1 Build 20070725. Results submitted to www.spec.org as of September 4th 2007 at 184.

Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit <http://www.intel.com/performance/resources/limits.htm> or call (U.S.) 1-800-628-8686 or 1-916-356-3104.

All dates and products specified are for planning purposes only and are subject to change without notice.

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.

SPECint2000 and SPECfp2000 benchmark tests reflect the performance of the microprocessor, memory architecture and compiler of a computer system on compute-intensive, 32-bit applications. SPEC benchmark tests results for Intel microprocessors are determined using particular, well-configured systems. These results may or may not reflect the relative performance of Intel microprocessor in systems with different hardware or software designs or configurations (including compilers). Buyers should consult other sources of information, including system benchmarks; to evaluate the performance of systems they are considering purchasing.

Performance and competitive information is accurate at time of document publication. For latest competitive and performance information, visit www.intel.com/performance.

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 Baseline: Dual-Core Intel® Xeon® processor 7140M.

³ Dual-Core Intel® Xeon® processor 7140M-based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, 16 GB (16x1GB) memory, Microsoft Windows Server 2003 Enterprise x64 Edition, BEA JRockit® 5.0 P27.2.0 JVM.

⁴ Quad-Core Intel® Xeon® processor X7350-based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® processor X7350, 2.93 GHz with 2x4M L2 Cache, 1066 MHz system bus, 16 GB (16x1GB) 667MHz FB-DIMM memory, Microsoft Windows Server 2003 Enterprise x64 Edition, BEA JRockit® 5.0 P27.2.0 JVM.

⁵ Benchmark Description for SPECfp*_rate_base2006: SPECfp*_rate_base2006 is a compute-intensive benchmark that measures the floating point throughput performance of a computer system carrying out a number of parallel tasks.

⁶ Configuration Details for SPECfp*_rate_base2006: Data Source—Measured results as of August 2007.

⁷ Configuration Details: Data Source: Intel internal measurement, August 2007.

⁸ Dual-Core Intel® Xeon® processor 7140M-based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, 32-GB (16x2GB) memory, Linux SLES 10 OS.

⁹ Quad-Core Intel® Xeon® processor X7350-based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® processor X7350, 2.93 GHz with 2x4M L2 Cache, 1066 MHz system bus, 64-GB (16x4GB) 667MHz FB-DIMM memory, Linux SLES 10 OS.

¹⁰ Configuration Details: Data Source: Intel internal measurement, August 2007.

¹¹ Dual-Core Intel® Xeon® processor 7140M-based platform details: Intel Server pre-production platform with four Dual-Core Intel® Xeon® processor 7140M, 3.40 GHz with 16M L3 Cache, 800 MHz system bus, Microsoft Windows 2003 Enterprise Edition.

¹² Quad-Core Intel® Xeon® processor X7350-based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® processor X7350, 2.93 GHz with 2x4M L2 Cache, 1066 MHz system bus, Microsoft Windows 2003 Enterprise Edition.

¹³ Configuration Details for SPECint*_rate2006: Data Source—Measured results as of August 2007.

¹⁴ Quad-Core Intel® Xeon® processor X5365-based platform details: Intel Server pre-production platform with two Quad-Core Intel® Xeon® processor X5365, 3.00 GHz with 2x4M L2 Cache, 1333 MHz system bus, 16 GB (8x2GB) memory, 64-Bit SUSE LINUX Enterprise Server 10, Kernel. SPEC binaries built with Intel C++ Compiler version 10.1.

¹⁵ Quad-Core Intel® Xeon® processor X7350-based platform details: Intel Server pre-production platform with four Quad-Core Intel® Xeon® processor X7350, 2.93 GHz with 2x4M L2 Cache, 1066 MHz system bus, 16 GB (16x1GB) 667MHz FB-DIMM memory, 64-Bit SUSE LINUX Enterprise Server 10, Kernel. SPEC binaries built with Intel C++ Compiler version 10.1.

¹⁶ 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.

¹⁷ 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.

¹⁸ Each pair of cores integrates 4 MB of L2 Intel® Advanced Smart Cache.

¹⁹ Enhanced Intel SpeedStep® Technology for specified units in this processor available Q2/06. See the Processor Spec Finder at <http://processorfinder.intel.com> or contact your Intel representative for more information.

²⁰ Other names and brands may be claimed as the property of others.

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