

SOLUTION BRIEF

Intel® Xeon® Processor
E7-8800/4800/2800 v2
Product Families



The Push for Smarter Analytics

Better business intelligence delivered by Intel® Xeon® processor-based solutions



Today's organizations face an unprecedented challenge: how to manage the deluge of data now available and properly analyze it to reveal the keys to success. According to Harvard Business Review, "[a]s of 2012, about 2.5 Exabytes of data are created each day, and that number is doubling every 40 months or so."¹

The big data trend is here to stay, and organizations need to find ways to make their data truly useful through data-intensive business intelligence (BI), including In-Memory real-time analytics, enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM). With the introduction of the Intel® Xeon® E7 processor v2 family and its ability to rapidly process massive data sets, Intel has made better BI possible.

Big data on its own isn't enough. Organizations need ways to analyze the data in real-time and transform that information into actionable business insights.

The Growth of Big Data

Organizations today, particularly those that extensively use ERP, virtualization, SCM, CRM and in-memory database (IMDB) systems, now generate petabytes of data. That's enough to fill 20 million traditional four-drawer file cabinets or produce 13.3 years of high-definition video.² Those data-intensive systems require both substantial memory capacity to minimize data processing time and high reliability to ensure system uptime and data integrity.

Big data on its own isn't enough. Organizations need ways to analyze the data in real-time and transform that information into actionable business insights and competitive advantage. And waiting for numbers to be crunched won't give organizations the insights they need to take advantage of emerging market opportunities for increased profits.

Business analysts used to examine data to determine appropriate strategies for using that information for business gain. But the sheer quantity of available data today makes it impossible for analysts to do things the old-fashioned way. Organizations must harness technology to dissect and scrutinize collected data like never before.

A Leap Toward Better BI

As data-hungry systems grow, technology innovators develop new and better ways to handle all that data. Hardware manufacturers are building servers with more processing performance and more robust memory configurations to accommodate data-intensive workloads and higher memory capabilities. Leading enterprise software vendors increasingly offer their industry-standard applications optimized for Intel Xeon processor-based solutions. For example, IBM DB2 pureScale*, SAS Business Intelligence*, the Oracle TimesTen In-Memory Database*, and Microsoft SQL Server* all take advantage of Intel Xeon processors to conduct near real-time analysis and complex queries on extremely large data sets. The SAP High-Performance Analytic Appliance* (SAP HANA) runs exclusively on Intel Xeon processor E7 family-based servers. It scales real-time analytics enterprise-wide while keeping data in main memory so that complex calculations and operations occur using data local to CPUs.

Key Characteristics of a Solid BI Setup

The next generation of highly effective business intelligence and real-time analysis solutions is entering the market using the Intel® Xeon® E7 processor v2 family, contributing superior performance, world-class reliability and uptime, and scalability to handle virtually any workload.

- Performance**—The Intel Xeon processor E7-8800/4800/2800 v2 product families feature up to 50% more cores/threads and up to 25% more Last Level Cache (LLC) than previous versions, for an up to 2x average top-bin performance increase.^{1,3} Integrated PCI Express* (PCIe) 3.0 provides up to 4x increased bandwidth for even faster time to business insights. They also have 3x the memory capacity through additional dual in-line memory module (DIMM) slots (up to 24 DIMMs per socket that can each support a maximum DIMM density of 64GB [LRDIMM])*. The huge advantage in memory capacity for this processor family delivers an enormous performance advantage for big datasets and In-Memory applications, and the total available memory slots provide expandability for unpredictable BI application needs.
- Reliability and Uptime**—Intel® Run Sure Technology⁴ includes the advanced reliability, availability, and serviceability features in the Intel Xeon processor E7-8800/4800/2800 v2 product families and builds upon Intel's long-standing tradition of technology innovation. ITIC'S July 2013 RAS report supports that Intel Xeon processor-based solutions maintain uptime comparable to RISC/UNIX⁵.
- Scalability**—The Intel® Xeon® E7 processor v2 family has the scalability to handle data-intensive workloads, with native CPU scaling across 2, 4, and 8 sockets. Organizations can even scale beyond 8 sockets by using a third-party node controller.

Faster, More Meaningful BI with Intel Xeon Processors

Recognizing the opportunities to be gained from real-time analysis of big data, organizations across a variety of industries rely on Intel Xeon processors to capture their data's value, improving business and growing profits. See case studies on the following page. To learn more about performance, reliability and uptime and scalability please see the Intel® Xeon® E7 processor v2 family [product brief](#).

Conclusion

Organizations around the globe are working to increase their competitive edge through improved BI with real-time analytics. To keep up with the need for data-intensive systems—those that are available today and those that have yet to be conceived—explore the Intel® Xeon® E7 processor v2 family and see how Intel can make business intelligence your competitive advantage.

Case Studies

Yunnan Telecom

Location: China

Industry: Telecom

Yunnan Telecom is the largest basic network operator and comprehensive information provider in China's Yunnan province. Rapid growth of the company's user base and service offerings made it challenging for internal systems to maintain high-quality service to customers. The company uses a business operations support system (B/OSS) to take service orders, process bills, collect payments, and perform other critical CRM functions. The B/OSS relied on a RISC-based server running on a closed system, but Yunnan Telecom wanted to modify the architecture to share workloads and improve scalability, so it deployed Intel Xeon processor E7 family-based servers and used Oracle Real Application Clusters (RAC). The two database nodes joined the RAC environment through load balancing to achieve high database reliability while taking advantage of server resources to enhance overall database performance.

After analyzing system performance over a full data cycle, Yunnan Telecom determined that the database server based on the Intel Xeon processor E7 family can assume 30% to 40% of the high-end RISC-based server workloads. Analysis also revealed that the server's CPU and memory usage remained low, giving the company flexibility and support for business growth. **"We hope to continue working with Intel to try newer and better technology and to discover effective, high-performance, low-cost approaches for Yunnan Telecom,"** says Cheng Zhongji, General Manager of Enterprise Information for Yunnan Telecom.⁷

"Performance was our top-most criterion, and we saw that we could meet our objectives using the Intel Xeon processor E7 family."

Vladimir Bulov, IT Development
Department Head, AutoVAZ

AutoVAZ

Location: Russia

Industry: Manufacturing

AutoVAZ is one of Russia's largest car manufacturers and a worldwide player in the automotive market segment. The company formed an alliance with Renault and Nissan in which all three manufacturers would have equal access to each other's product platforms and engine specifications. The reality of sharing that level and quantity of information meant that AutoVAZ needed to improve its server infrastructure to increase system reliability and support consistent IT approaches. The infrastructure included hundreds of servers running ERP software and earlier Intel Xeon processors. AutoVAZ assessed the performance and reliability of the Intel Xeon processor E7-4860 through a pilot project and found that the performance of ERP workloads for online transaction processing and online analytical processing improved by a factor of six to one.

AutoVAZ implemented HP servers powered by the Intel Xeon processor E7 family. Up to 12,000 users now benefit from much faster response times when sharing data through the ERP system. **"Performance was our top-most criterion, and we saw that we could meet our objectives using the Intel Xeon processor E7 family,"** says Vladimir Bulov, IT Development Department Head at AutoVAZ.⁸

Learn more about the Intel Xeon Processor E7-8800/4800/2800 v2 Product Families [here](#).

Learn more about new RAS features in Intel Xeon E7 processor v2 family [here](#).

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+ Software and workloads used in performance tests may have been optimized for performance only on Intel(r) 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. Harvard Business Journal "Big Data: The Management Revolution" by Andrew McAfee and Erik Brynjolfsson" October 2012; <http://hbr.org/2012/10/big-data-the-management-revolution>

2. <http://mozy.com/blog/misc/how-much-is-a-petabyte/>

3. Intel internal measurements as of November 2013

Configuration Details

- OLTP brokerage workload results using Microsoft SQL Server* (transactions per second) – Intel Technical Report (TR) #1371.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 64x 8 GB DDR3-1066 memory (512 GB) scoring 3008 with SQL Server* 2012.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 16 GB DDR3-1333 (running at 2666MHz) memory (1 TB) scoring 5216 with SQL Server* 2012 (+1.73x).
- OLTP warehouse workload results using Oracle* 11g R2 (transactions per minute) – Intel Technical Report (TR) #1346.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 64x 8 GB DDR3-1066 memory (512 GB) scoring 2740K.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 16 GB DDR3-1333 (running at 2666MHz) memory (1 TB) scoring 4789K (+1.75x).
- Commercial General Purpose Throughput (Integer Compute) using SPECint*_rate_base2006 benchmark results compiled with Intel Compiler Parallel Studio XE 2014.1 – Intel Technical Report (TR) #1339.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 64x 8 GB DDR3-1066 memory (512 GB) scoring estimated 1100 baseline.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 8 GB DDR3-1333 (running at 2666MHz) memory (1TB) scoring estimated 2288 baseline (+2.08x).
- HPC Application Throughput (Floating-Point Compute) using SPECfp*_rate_base2006 benchmark results compiled with Intel Compiler Parallel Studio XE 2014.1 – Intel Technical Report (TR) #1339.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 64x 8 GB DDR3-1066 memory (512 GB) with Intel Compiler Fortran 13.1 scoring estimated 741 baseline.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 8 GB DDR3-1333 (running at 2666MHz) memory (1TB) Intel Compiler Fortran 14.0 scoring estimated 1675 baseline (+2.26x).
- Memory bandwidth using STREAM_OMP TRIAD benchmark results – Intel Technical Report (TR) #1344.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 32x 8 GB DDR3-1066 memory (256 GB) scoring 101 GB/s.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 8 GB DDR3-1333 (running at 2666MHz) memory (512 GB) scoring 243 GB/s (+2.41x).
- Matrix multiplication using LINPACK_MP benchmark results based on Intel Math Kernel Library (MKL) (GFLOPs) – Intel Technical Report (TR) #1157b and 1372.
 - Baseline configuration: 4-Socket Intel® 7500 Chipset-based Server with four Intel® Xeon® processors E7-4870 (30M Cache, 2.40 GHz, 10 Cores) using 64x 4 GB DDR3-1066 memory (512 GB), Intel MKL 10.3.0 scoring 353.6 GFLOPs.
 - New Intel configuration: 4-Socket Intel® C602] Chipset-based Server with four Intel® Xeon® processors E7-4890 v2 (37.5M Cache, 2.80 GHz, 15 Cores) using 64x 8 GB DDR3-1333 (running at 2666MHz) memory (1TB) scoring 1235 GFLOPs (+3.50x).

4. No computer system can provide absolute reliability, availability or serviceability. Requires an Intel® Run Sure Technology-enabled system, including an enabled Intel processor and enabled technology(ies). Built-in reliability features available on select Intel® processors may require additional software, hardware, services and/or an Internet connection. Results may vary depending upon configuration. Consult your system manufacturer for more details.

5. ITIC "Intel Xeon Processor E7 Family Reaches Reliability Parity with RISC/UNIX, Delivers 99.999% Reliability, Availability and Serviceability" July 2013; <http://www.intel.com/content/dam/www/public/us/en/documents/white-papers/xeon-e7-ras-itic-paper.pdf>

6. IBM Systems and Technology Case Study, "Alleviating performance problems with IBM System x and BladeCenter solutions", January 2012. <http://public.dhe.ibm.com/common/ssi/ecm/en/xsc03111usen/XSC03111USEN.PDF>

Intel case study video link: <http://www.intel.com/content/www/us/en/data-center-efficiency/data-center-efficiency-xeon-e7-musc-cloverleaf-video.html?wapkw=musc>

7. Intel Case Study, "High-Performance Billing System", 2012.

<http://www.intel.com/content/dam/www/public/us/en/documents/case-studies/performance-xeon-e7-yunnan-billing-study.pdf>

8. Intel Case Study, "Motoring on", 2011.

<http://www.intel.com/content/www/us/en/mission-critical/mission-critical-xeon-e7-4860-autovaz-motoring-on-study.html>

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