Intel® Xeon® Processor E7-8800/4800 v4 Product Family
ISV Optimizations Fact Sheet

UNLOCK THE POTENTIAL OF TIMELY, ACTIONABLE INSIGHTS

The power to turn raw data into actionable insight lies at the center of today's successful businesses, and the opportunity is growing every day. Intel's enablement and co-engineering relationships with global, enterprise-focused Independent Software Vendors (ISVs) delivers advantages across industries. The Intel® Xeon® processor E7 v4 product family delivers excellent performance, scalability, reliability, and security for mission-critical computing.

Amazing Performance

Performance for workloads that range from analytics to manufacturing makes the Intel Xeon processor E7 v4 product family ideal for the most demanding enterprise software. Intel® Transactional Synchronization Extensions (Intel® TSX), virtualization improvements, and new optimizations for Intel® Advanced Vector Extensions 2.0 (Intel® AVX2) help applications do more with less as you accelerate operations, rapidly deliver new services, and improve customer experiences.

Scalability for Large-Capacity Workloads

A massive memory footprint (up to 24 TB[1]) enables very large in-memory databases to be held entirely in RAM, for accelerated, large-scale analytics and transaction processing (OLTP and OLAP) in real time. Because the Intel Xeon processor E7 v4 product family has more cores than its predecessors, multi-threaded software applications can take advantage of these capabilities to scale to multi-terabyte and even petabyte data sets, for broader insights that help you make more-informed decisions.

Reliability to Help Protect Operations

The Intel Xeon processor E7 v4 product family is designed to increase mission-critical system uptime. Software optimizations for new reliability features help enterprise applications reduce the frequency of server downtime, helping minimize business losses due to lost productivity and associated maintenance and support costs. At the same time, these features help software protect the integrity of your vital data.

Security Features for Critical Data

Using new security features on the Intel Xeon processor E7 v4 product family, enterprise applications take advantage of combined hardware and software measures to protect corporate data from being compromised. The software benefits from cryptography-acceleration instructions and an improved random-number generator to implement encryption more broadly. Customers get excellent protection for their sensitive data, which helps minimize business losses.

Solid Performance Gains

The Intel® Xeon® processor E7 v4 product family has demonstrated outstanding performance gains across a variety of enterprise applications, the highlights of which are captured below. (Note: Performance improvements depend on specific processors and platform ingredients used in test configurations, which vary among the reported benchmarks.)

- **Big data analytics (up to 1.26X faster than the previous generation[2])**. Deep insights produced from big data are reshaping business opportunities, with advanced research, improved products and services, and better customer experiences. Massive memory enables the Intel Xeon processor E7 v4 product family to hold large databases in RAM. For example, in-memory data management solutions can provide up to a 3.2X performance gain with the latest generation processor, compared to one from about five years ago,[3] expanding your ability to generate actionable, real-time insights. Watch the video.

- **Enterprise database (up to 1.27X faster than the previous generation and 1.78X faster than two generations ago[4])**. Data is emerging as the most important asset to many organizations, and the databases that handle it need rapid, dependable OLTP/OLAP capabilities. The Intel Xeon processor E7 v4 product family is ready for the job, with massive memory capacity, headroom for growth, and added performance potential from Intel® Transactional Synchronization Extensions (Intel® TSX) and the Intel® Solid State Drive (Intel® SSD) Data Center Family. Read the AsiaInfo solution brief.

- **Core business, telecommunications, and cloud (up to 1.32X faster than the previous generation[5])**. Vendors all over the world have optimized their software for the Intel Xeon processor E7 v4 product family. As a result, your business has the potential to handle larger workloads with less capital investment, for tasks that range from enterprise resource planning to managing applications, data, and cloud infrastructure. Software security enablement using new hardware-accelerated encryption capabilities can boost performance as well. Now you can deliver more transactions per second, better user experiences, and more innovative services.

- **Technical computing (up to 1.51X faster than the previous generation[6])**. Discovery and new understanding—from tiny cellular structures to the vast forces of the cosmos—rely on massive computations. Software optimizations that take advantage of specific features of the Intel Xeon processor E7 v4 product family put processing power that used to be reserved for supercomputers into today's data centers. Compared to the Intel® Xeon® processor E7 v2 product family, some technical computing applications can offer up to a 1.68X performance gain[7] enabling scientists in industrial R&D to perform more accurate studies while accelerating time-to-market for products.

- **Financial services (up to 1.4X faster than the previous generation[8])**. Banks and other financial institutions need to run large-scale computations quickly to support everything from analyzing risk to identifying trading opportunities. Wins often go to the trader that senses market signals first and takes action on them, and the Intel Xeon processor E7 v4 product family helps deliver those wins, with up to a 2.8X performance gain over systems from two generations ago.[9] Turn volatility into profitability by accelerating the calculations that deliver those insights, and seize opportunities that may otherwise go to your competitors. Read the Kx Systems solution brief.

Learn More

To explore the entire scope of these and many more ISV performance benchmarks, visit the **Intel® Xeon® Processor E7 v4 Product Family Software Solutions page**.

[1] Max memory capacity computed using 128 GB DDR4 3DS LR-DIMM.

[2] **SAS Business Analytics***: SAS 9.4 m2 workload. OS: Red Hat Enterprise Linux* 7.1 kernel 3.10.0-229. Testing by Intel and SAS May 2016.
BASELINE: 4S Intel® Xeon® processor E7-4890 v3, 2.5 GHz, 18 cores, turbo and HT on, BIOS 63.R00, 1024 GB total memory, 32 slots / 32 GB / 2400 MT/s / DDR4 LRDIMM, 7x 800 GB Intel® Solid State Drive Data Center (Intel® SSD DC) S3700 + 4 2TB Intel SSD DC Family for NVMe*.
NEW: 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, turbo and HT on, BIOS 338.R00, 1024 GB total memory, 32 slots / 32GB / 2400 MT/s / DDR4 LRDIMM, 7x 800 GB Intel SSD DC S3700 + 4 2TB Intel SSD DC Family for NVMe.

[3] **Software AG Terracotta* EHCache 3.0.0**: In-memory customer data access workload. OS: CentOS* 7 3.10.0-327.el7.x86_64. Testing by Intel and Software AG May 2016.
BASELINE: 4S Intel® Xeon® processor E7-4870, 2.4 GHz, 10 cores, turbo and HT on, BIOS S009.011120111500, 1 TB total memory, 32 slots / 32 GB / 1333 MT/s / DDR3LRDIMM, 1 Intel® Solid State Drive Data Center (Intel® SSD DC) S3700.
NEW: 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, turbo and HT on, BIOS BRBDXSD1.86B.0338.R00.1603162127, 6 TB total memory, 96 slots / 64 GB / 2400 MT/s / DDR4 LRDIMM, 1 Intel SSD DC S3700.

[4] **AsiaInfo ADB***: AsiaInfo ADB* Database OCS - k-tpmC workload. OS: AsiaInfo ADB on Ubuntu* 15.10, Kernel 4.2, ADB v1.1, glibc 2.21. Testing done by AsiaInfo and Intel April 2016.
BASELINE: 4S Intel® Xeon® processor E7-4890 v2, 2.8 GHz, 15 cores, turbo and HT on, 256 GB DDR3/1333, DIMM, BIOS 38R02, Intel® Solid State Drive Data Center (Intel® SSD DC) S3700 for OS, Intel SSD DC P3700 2 TB x 2, 10-Gigabit Intel® X540-AT2 network.
NEXT GEN: 4S Intel® Xeon® processor E7-8890 v3, 2.5 GHz, 18 cores, turbo and HT on, 256 GB DDR4/1600, LVDIMM, BIOS 56R01, Intel SSD DC S3700 for OS, Intel SSD DC P3700 2 TB x 2, 10-Gigabit Intel X540-AT2 network.
NEW: 4S Intel® Xeon® processor E7-8890 v4, 2.2GHz, 24 cores, turbo and HT on, 256 GB DDR4/1600, LVDIMM, BIOS: 338R00, Intel SSD DC S3700 for OS, Intel SSD DC P3700 2TB x 2, 10-Gigabit Intel X540-AT2 network.

[5] **Neusoft Aclome* 4.7**: Neusoft Aclome Cloud Management - Transactions per second (TPS) workload. OS: CentOS*. Testing done by Neusoft April 2016.
BASELINE: SaCa Aclome 5.0, 4S Intel® Xeon® processor E7-8890 v3, 2.5 GHz, 18 cores, turbo and HT on, 256 GB total memory 16 slots / 16 GB / 1600 MT/s / DDR4 LRDIMM, Intel® Solid State Drive Data Center (Intel® SSD DC) S3700 800 GB, 1 GB network speed.
NEW: SaCa Aclome 5.0; with new security features, 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, turbo and HT on, 256 GB total memory 16 slots / 16 GB / 1600 MT/s / DDR4 LRDIMM, Intel SSD DC S3700 800 GB, 1 GB network speed.

[6] **S and I Engineering Hi-FUN***: Aerospace CFD flow solver High Resolution Flow Solver on Unstructured Meshes workload. OS: Red Hat Enterprise Linux* 7.1 kernel 3.10.0-229. Testing by Intel May 2016.
BASELINE: 4S Intel® Xeon® processor E7-4890 v3, 2.5 GHz, 18 cores, turbo and HT on, 512 GB total memory, 32 slots/16 GB/1600 MT/s / DDR3 RDIMM.
NEW: 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, turbo and HT on, 512 GB total memory, 32 slots / 16 GB / 1600 MT/s / DDR3 RDIMM.

[7] **Dassault Systemes BIOVIA CASTEP/Forcite***: CASTEP 9. MKL 11.1.2. AET_NMR workload. OS: Red Hat Enterprise Linux* 7.1 kernel3.10.0-229. Testing by Intel April 2016.
BASELINE: 4S Intel® Xeon® processor E7-4890 v2, 2.8 GHz, 15 cores, 256 GB 32 slots / 8 GB / 1333 MT/s / DDR3RDIMM, 1 GB network speed.
NEW: 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, 256 GB 32 slots / 8 GB / 1333 MT/s / DDR3RDIMM, 1 GB network speed.

[8] **FIS Adaptiv***: Adaptiv Analytics 152. MKL 11.0.5. IPP 7.1.1 calculations per second workload. OS: Windows Server* 2012 R2 Standard. Testing by Intel and FIS May 2016.
BASELINE: Adaptiv Analytics 152, 4S Intel® Xeon® processor E7-8890 v3, 2.5 GHz, 18 cores, HT and C states disabled, turbo on, 256 GB total memory 32 slots / 8 GB / 1333 MT/s / DDR3 RDIMM. 1 Gb network.
NEW: Adaptiv Analytics 152 modified, 4S Intel® Xeon® processor E7-8890 v4, 2.2GHz, 24 cores, HT and C states disabled, turbo on, 256 GB total memory 32 slots / 8 GB / 1333 MT/s / DDR3 RDIMM. 1 Gb network.

[9] **Kx Systems kdb+***: STAC-M3* ß1.10T.THEOPL.TIME high-speed analytics on time series, tick-by-tick market data workload. See www.STACresearch.com/Kx for more information. Testing by STAC, April 2016.
BASELINE: Kx Systems kdb+ 3.1 software on Shasta suite tests. 4S Intel® Xeon® processor E7-4890 v2, 2.8 GHz, 15 cores, turbo and HT on, 6144 GB total memory, 96 slots / 64 GB / 1066 MT/s / DDR3 RDIMM. CentOS* Release 6.3 with ext4, 1 Gb network, 1 Gb network.
NEW: Kx Systems kdb+ 3.3 software on Shasta suite tests 4S Intel® Xeon® processor E7-8890 v4, 2.2 GHz, 24 cores, turbo and HT on, 6144 GB total memory, 96 slots / 64 GB / 1333 MT/s / DDR4 RDIMM. Red Hat Enterprise Linux 7.2-kernel 3.10.0-327, 1 Gb network.

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 more complete information visit www.intel.com/performance/datacenter.

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