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Latest Intel Xeon Processors Accelerate Data Center Transformation for the Digital Services Era

New Technologies Provide a Range of Capabilities and Are Central to Enabling a Software Defined Infrastructure

NEWS HIGHLIGHTS

- New monitoring and management features aid rapid, automated deployment of workloads, increase efficiency and improve service quality.
- Provides leadership performance for compute, storage and network workloads to enable efficient and dynamic operation in cloud environments.
- Twenty-seven new performance world records[1], with increases up to 3x compared with previous generation[2].
- Up to 50 percent more cores and cache[3] than the previous generation, and first-ever server platform supporting DDR4 memory for improved application performance.

SANTA CLARA, Calif.--(BUSINESS WIRE)-- Intel Corporation today introduced the Intel® Xeon® processor E5-2600/1600 v3 product families to address the requirements of diverse workloads and the rapidly evolving needs of data centers. The new processor families include numerous enhancements that provide performance increases of up to 3x over the previous generation[2], world-class energy efficiency and enhanced security. To facilitate the explosive demand for software defined infrastructure (SDI), the processors expose key metrics, through telemetry, which enable the infrastructure to deliver services with the best performance, resilience and optimized total cost of ownership.

The processors will be used in servers, workstations, storage and networking infrastructure to power a broad set of workloads such as data analytics, high-performance computing, telecommunications and cloud-based services, as well as back-end processing for the Internet of Things.

"The digital services economy imposes new requirements on the data center, requirements for automated, dynamic and scalable service delivery," said Diane Bryant, senior vice president and general manager of the Data Center Group at Intel. "Our new Intel processors deliver unmatched performance, energy efficiency and security, as well as provide visibility into the hardware resources required to enable software defined infrastructure. By enabling the re-architecture of the data center, Intel is helping companies fully exploit the benefits of cloud-based services."

Intel® Xeon® Processor E5-2600/1600 v3 Product Family (Photo: Business Wire)

Enabling Software Defined Infrastructure

Software defined infrastructure (SDI) is the foundation for cloud computing. The digital services economy requires agility and scale that demands all infrastructure resources be programmable and highly configurable. These abilities, coupled with telemetry, analytics, and automated actions, allow the data center to become highly optimized. Intel continues to invest in delivering this vision of an automated data center, and with the new Xeon E5-2600 v3 product family, the company has introduced key sensors and telemetry that further enhance SDI.

The Intel Xeon processor E5-2600 v3 product family introduce new features that provide greater visibility into the system than ever before. A new cache monitoring feature provides data to enable orchestration tools to intelligently place and rebalance workloads resulting in faster completion times. This also provides the ability to conduct analysis of performance anomalies due to competition for cache in a multitenant cloud environment where there is little visibility into what workloads consumers are running.

The new processors also include platform telemetry sensors and metrics for CPU, memory and I/O utilization. With the addition of thermal sensors for airflow and outlet temperature, the visibility and control has increased significantly from the prior generation. The processors offer a holistic set of sensors and telemetry for any SDI orchestration solution to more closely monitor, manage and control system utilization to help maximize data center efficiency for a lower total cost of ownership.

Increased Performance and Energy Efficiency

With up to 18 cores per socket and 45MB of last-level cache, the Intel Xeon E5-2600 v3 product family provides up to 50 percent more cores and cache compared to the previous generation processors. In addition, an extension to Intel® Advanced Vector Extensions 2 (Intel AVX2)[4] doubles the width of vector integer instructions to 256 bits per clock cycle for integer sensitive workloads and delivers up to 1.9x higher performance gains[5].

The Xeon E5-2600 v3 product family also increases virtualization density, allowing support for up to 70 percent more VMs per server compared to the previous generation processors[6], which helps to reduce data center operational expenses. Memory bandwidth constrained workloads will gain up to 1.4x higher performance compared to the previous generation[7] with the support of next-generation DDR4 memory. Intel Advanced Encryption Standard New Instructions (Intel® AES-NI) have also been enhanced to accelerate data encryption and decryption by up to 2x without sacrificing application response times[8].

The processors are built using Intel's industry-leading and energy-efficient 22nm, 3-D Tri-Gate technology, cutting power consumption while boosting performance of transistors. The new "per-core" power states dynamically regulate and adjust power in each processor core for more power-efficient workload processing.

Combining both record performance and advanced efficiency features, the Intel Xeon processor E5-2600 v3 product family sets a new world record for server energy efficiency[9] based on performance per watt.

Creating Open, Flexible Networks with Intel Xeon E5-2600 v3 Processors

Intel Xeon E5-2600 v3 processors can be paired with the Intel® Communications Chipset 89xx series featuring Intel® Quick Assist Technology to enable faster encryption and compression performance[10] to improve security in a wide range of workloads. Service providers and networking equipment providers can use the platform to consolidate multiple communications workloads onto a single, standardized and flexible architecture to speed up services deployment, reduce costs, and create a more consistent and secure user experience.

In addition, the new Intel® Ethernet Controller XL710 family helps address the increasing demands on networks with capabilities to enable better performance for virtualized servers and networks. The flexible 10/40 gigabit Ethernet controller provides twice the bandwidth while consuming half the power compared with the previous generation[11].

Extensive industry support

Starting today, system manufacturers from around the world are expected to announce hundreds of Intel® Xeon® processor E5 v3 family-based platforms. These manufacturers across servers, storage and networking include Bull*, Cray*, Cisco*, Dell*, Fujitsu*, Hitachi*, HP*, Huawei*, IBM*, Inspur*, Lenovo*, NEC*, Oracle*, Quanta*, Radisys*, SGI*, Sugon* and Supermicro*, among many others.

Pricing details

The Intel Xeon processor E5-2600 v3 product family will be offered with 26 different parts that range in price from $213 to $2,702 in quantities of 1,000. Intel Xeon processor E5-1600 workstations will be offered with six different parts in prices ranging from $295 to $1,723. Complete pricing details can be found in the Intel Newsroom. For more details on these new Intel Xeon processors, visit the online press kit.

About Intel

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[1]Twenty-seven performance world records based on two-socket configurations. Source as of Sept. 8, 2014. Full details available at: http://www.intel.com/content/www/us/en/benchmarks/server/xeon-e5-2600-v3/xeon-e5-2600-v3-summary.html.

[2]Source as of Sep. 8, 2014. New configuration: Hewlett-Packard Company HP ProLiant ML350 Gen9 platform with two Intel Xeon Processor E5-2699 v3, Oracle Java Standard Edition 8 update 11, 190,674 SPECjbb2013-MultiJVM max-jOPS, 47,139 SPECjbb2013-MultiJVM critical-jOPS. Source. Baseline: Cisco Systems Cisco UCS C240 M3 platform with two Intel Xeon Processor E5-2697 v2, Oracle Java Standard Edition 7 update 45, 63,079 SPECjbb2013-MultiJVM max-jOPS , 23,797 SPECjbb2013-MultiJVM critical-jOPS. Source.

[3]Intel® Xeon® Processor E5-2699 v3 (18C, 45M Cache) compared to Intel® Xeon® Processor E5-2697 v2 (12C, 30M Cache).

[4]Intel® Advanced Vector Extensions (Intel® AVX)* provides higher throughput to certain processor operations. Due to varying processor power characteristics, utilizing AVX instructions may cause a) some parts to operate at less than the rated frequency and b) some parts with Intel® Turbo Boost Technology 2.0 to not achieve any or maximum turbo frequencies. Performance varies depending on hardware, software, and system configuration and you can learn more at http://www.intel.com/go/turbo.

[5]Source as of August 2014 TR#3034 on Linpack*. Baseline configuration: Intel® Server Board S2600CP with two Intel® Xeon® Processor E5-2697 v2, Intel® HT Technology disabled, Intel® Turbo Boost Technology enabled, 8x8GB DDR3-1866, RHEL* 6.3, Intel® MKL 11.0.5, score: 528 GFlops. New configuration: Intel® Server System R2208WTTYS with two Intel® Xeon® Processor E5-2699 v3, Intel® HT Technology disabled, Intel® Turbo Boost Technology enabled, 8x16GB DDR4-2133, RHEL* 6.4, Intel® MKL 11.1.1, score: 1,012 GFlops

[6]Source as of Sept. 8, 2014. New configuration: Hewlett-Packard Company ProLiant DL360 Gen9 with two Intel Xeon Processor E5-2699 v3, SPECvirt_sc2013 1614 @ 95 VMs. Source**.** Baseline: IBM System x3650 M4 platform with two Intel Xeon Processor E5-2697 v2, SPECvirt_sc2013 947.0 @ 53 VMs. Source.

[7]Source as of August 2014 TR#3044 on STREAM (triad): Intel® Server Board S2600CP with two Intel® Xeon® Processor E5-2697 v2, 24x16GB DDR3-1866 @1066MHz DR-RDIMM, score: 58.9 GB/sec. New Configuration: Intel® Server System R2208WTTYS with two Intel® Xeon® Processor E5-2699 v3, 24x16GB DR4-2133 @ 1600MHz DR-RDIMM, score: 85.2 GB/sec.

[8]Source as of June 2014 on AES-128-GCM Encryption algorithm: Intel internal measurements using Intel® Server Board S2600CW2S with two Intel® Xeon® Processor E5-2658 v3, DDR4-2133, CentoOS v3.8.4, Open SSL v1.0.2-beta1. Baseline Configuration: Intel internal measurements with two E5-2658 v2, DDR3-1866, CentoOS v3.8.4, Open SSL v1.0.2-beta1.

[9]Comparison based on SPECpower_ssj2008 results published (http://www.spec.org/) as of Aug. 26, 2014. Sugon I620-G20 platform with two Intel Xeon Processor E5-2699 v3, IBM J9 VM, 10,599 overall ssj_ops/watt. Source (http://www.sugon.com/).

[10]Intel® Communications Chipset 8920 (20Gbps) compared to Intel Communication Chipset 8955 (50Gbps) capable of up to 2.5x more encryption acceleration. Intel® Communications Chipset 8920 (8Gbps) compared to Intel Communication Chipset 8955 (24Gbps) capable of up to 3x more compression acceleration. 8920 Configuration: C8920 PCIe x16 QA Driver/SDK Release 1.0.0-77 Stargo/ Gladden 4C-8T-8 MB LLC - 2GHz, 2C-4T used for peak CCK throughputs. 8955 Configuration: [8955 PCIe x16 on a Shumway development Platform with Ivy Bridge EP CPUs and QA Driver/SDK 1.00. Tests were performed using UP/8 cores; Measured by Intel].

[11]Source as of Aug 2014: Calculated Gb/Watt for 2@ Intel Ethernet CNA X520-DA2 Dual-port Twinax Typical Power 11.6W 2: 1@ Intel Ethernet CNA X710-DA4 Quad-port Twinax Typical Power 3.4W for a 222% increase in Gb/Watt (Typical).

Photos/Multimedia Gallery Available:
http://www.businesswire.com/multimedia/home/20140908005295/en/

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