

Platform Brief

Intel® Xeon® Processor E5-2600 v3 Product Family
and Intel® Communications Chipset 89xx Series
Communications Infrastructure System



Intel® Xeon® Processor E5-2600 v3-Based Platform for Communications Infrastructure, Enterprise, Telco, and Cloud

The Intel® Xeon® E5-2600 v3 Product Family paired with the Intel® Communications Chipset 89xx Series with Intel® QuickAssist Technology, provides hardware-assisted acceleration for Security, Packet, and Compression workloads



Platform Overview

Manufactured on industry-leading 22nm process technology with 3D Tri-Gate transistors, the Intel® Xeon® E5-2600 v3 Product Family processors provide significant performance and power efficiency improvement over the previous-generation Intel® Xeon® processors E5-2600 v2 product family. Utilizing the Intel® microarchitecture, codename Haswell, it is the first Intel® Xeon® processor family with extended life cycle support to offer 12-core/ single-socket to 24-core/dual-socket configurations.

The platform provides performance, I/O, and memory capabilities for a wide range of compute-intensive applications, including Cloud (Computing/Storage/Networking), Enterprise (Web, Mail, Secure Search, VPN, Firewalls), and Telco (Software Defined Network, Network Function Virtualization, 3G, 4G LTE) and Communication Infrastructure (Routers, Gateways) applications.

The Intel® Communications Chipset 89xx Series with Intel® QuickAssist Technology, when paired with the Intel Xeon E5 v3 Product Family, offers hardware-assisted acceleration for workload optimization. Applications that use Intel QuickAssist Technology increase workload efficiency by offloading servers from having to handle compute-intensive security, compression, and packet

operations. Intel QuickAssist Technology is not only ready for today's network and communications infrastructure solutions as a chipset supporting the capability to boot the Intel® Xeon® E5 v3 Product Family, but also ready for standard Enterprise and Cloud Servers by way of the PCIe* Intel® QuickAssist Adapter Card. Both the Intel® Communication Chipset 89xx Series and the PCIe Intel QuickAssist Adapter Card support Intel QuickAssist Service virtualization for Software Defined Networking (SDN) and Network Functions Virtualization (NFV) initiatives.

Performance.

Workload Optimization for Greater Data Center Efficiency. As Enterprise IT seeks to deliver business value as fast as possible with lowest cost of ownership; as Cloud Service Providers scale and maintain SLAs in face of shifting customer demands while optimizing cost of service delivery; as Telco Service Providers seek to reduce network cost of operation and enable business innovation to drive incremental revenue; the new Intel Xeon E5 v3 Platform with Intel QuickAssist Technology is designed to optimize workloads that utilize Security, Compression, and Packet operations.

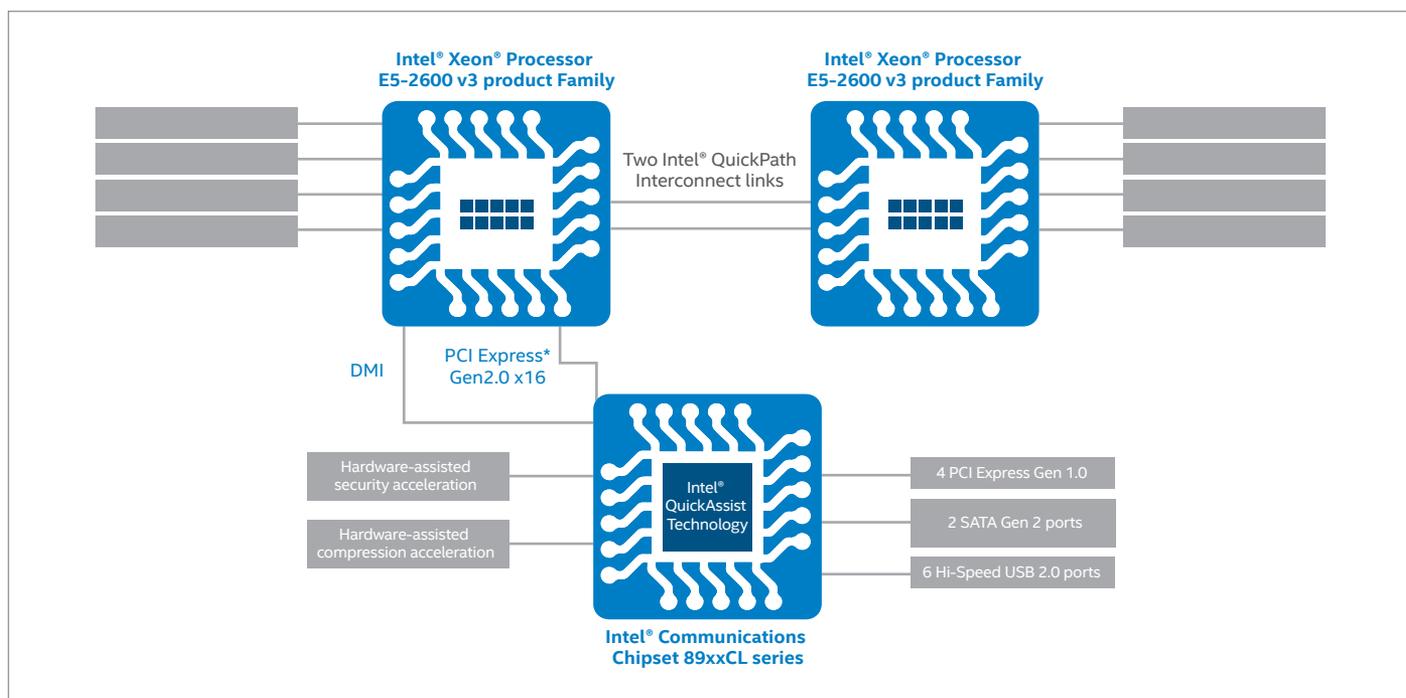


Figure 1. Dual-socket (shown) or single-socket configurations based on the Intel® Xeon® processor E5-2600 v3 product family are ideal for compute-intensive or thermally constrained embedded and communications applications.

INTEL® COMMUNICATIONS CHIPSET 89xx SERIES				
	8926	8925	8950	8955
Bulk Encryption/SSL (Gbps)	None	25G	50G	50G
IPSec (Gbps)	None	25G	43G	43G
Compression (Gbps)	20G	12G	20G	24G
Kasumi/Snow3G (Gbps)	None	Up to 30G		
RSA 2k-bit key (ops/sec)	None	20K	35K	40K
Thermal Design Power (Watt)	17W	17W	20W	20W
PCI Express Gen 2.0 Endpoint	X16	X16	X16	X16
Integrated Intel® Ethernet Gbe	None	None	None	None
PCI Express Gen 1.0	4x1	4x1	4x1	x1
SATA Gen 2/USB 2.0 ports	2/6	2/6	2/6	2/6
SR-IOV Virtual Functions	32	16	32	32
Package	FCBGA: 27mm x 27mm with 0.7 variable pitch			

SOFTWARE OVERVIEW – INTEL® QUICKASSIST TECHNOLOGY	
OPERATING SYSTEM	CONTACT
Linux* (Fedora 16 and CentOS* 6.x)	Intel provides drivers ¹

INTEL® XEON® PROCESSOR E5-2600 V3-BASED PLATFORMS

FEATURES	BENEFITS
Supports Key Embedded and Storage Platform Requirements	Ideal for compute-intensive embedded, communications, and storage applications.
Compatible with Intel® enterprise server solutions	Maximizes design reuse potential between enterprise and embedded solutions.
Extended life cycle product support	Protects system investment by enabling extended product availability for embedded, communications, and storage customers.
Low-power, high-reliability and robust thermal profile processor options	<ul style="list-style-type: none"> • Ideal for NEBS Level 3 ambient operating temperature specifications. • Ideal for applications with thermal constraints (blades), especially solutions requiring compliance with AdvancedTCA* form factor specifications (PICMG 3.0).
Ecosystem support	From modular components to market-ready systems, Intel and the 250+ global member companies of the Intel® Network Builder (networkbuilders.intel.com/) and Intel® IOT Solutions Alliance (intel.com/go/intelligentsystems-alliance), provide the performance, connectivity, manageability, and security developers need to create smart, connected systems.
Intelligent Performance	Delivers optimum efficiency by adapting performance to embedded application needs.
Large Intel® Smart Cache (L3)	Up to 30 MB cache accelerates processing by bringing and keeping more data closer to the cores and reducing memory reads.
Intel® Turbo Boost Technology ²	Boosts performance for specific workloads by increasing processor frequency.
Intel® QuickPath Interconnect	Supports up to 9.6 GT/s ³ to enable high-performance, dual-socket designs.
Intel® Hyper-Threading Technology ⁴	Helps boost performance for parallel, multi-threaded applications.
Intel® Advanced Vector Extensions Floating 2.0	<p>CPU instructions that:</p> <ul style="list-style-type: none"> • Accelerate floating point operations used in technical computing applications • Improve compute-intensive performance with Fused Multiply Add (FMA) • Accelerate integer vector operations used by storage workloads (incl. tiering and thin provisioning) • Provides instructions useful for compression and encryption
Secure Computing	Speeds performance for digital signal and image processing applications, such as radar detection, hurricane command centers, ruggedized navigation systems, and remote medical image processing.
Intel® Data Protection Technology ⁵ with Secure Key	Provides faster and more secure encryption to help protect data and assets from loss.
Intel® Platform Protection Technology ⁶ with OS Guard	Enhances protection against malware by preventing execution of calls to the OS from compromised applications in the user mode or code pages.
Intel® Trusted Execution Technology ⁷	Delivers a more secure boot and launch environment.
Intel® AES New Instructions ⁸ (Intel® AES-NI)	<ul style="list-style-type: none"> • Improves security without slowing response time and delivers more efficient cryptographic performance. • Accelerates AES encryption and decryption used in multiple communications workloads.
Automated Energy Efficiency	Reduces idle power consumption.
Integrated power gates	Allows idling cores to be reduced to near-zero power independent of other cores.
Automated low-power states	Puts processor, memory, and I/O controller into the lowest available power states that will meet the current workload requirements.
Fully Integrated Voltage Regulator (FIVR)	In the Intel® Xeon® processor E5-2600 v3 family, voltage regulation is now integrated onto the die, enabling performance and power improvements that traditional solutions cannot provide.
Flexible Virtualization	Enhances virtualization performance.
Intel® Virtualization Technology ⁹ (Intel® VT)	<ul style="list-style-type: none"> • Hardware assists boost virtualization performance by allowing OS more direct access to the hardware. • Intel® VT FlexMigration enables seamless migration of running applications among current and future Intel® processor-based servers. • Intel® VT FlexPriority improves virtualization performance by allowing guest OSs to read and change task priorities without virtual machine monitor (VMM) intervention. • Extended Page Tables provide better performance by reducing the overhead caused by page table utilization of virtual machines.
Advanced Programmable Interrupt Controller virtualization (APICv)	Decreases overhead in the handling of instruction interrupts in the core. Virtual machines (VMs) no longer need to wait for thousands of instruction cycles per every exit to the VMM.
Cache Quality of Service (QoS) Monitoring (virtualization performance improvement)	<ul style="list-style-type: none"> • Improves platform efficiency via greater insight into resource utilization • The processor assists to monitor last level cache space utilization per VM • Addresses “noisy neighbor” issues that can occur in virtualized environments • Cache Monitoring and Allocation increases deterministic behavior
Intel® Virtual Machine Control Structure (VMCS) shadowing	Enables efficient nested virtualization usages with reduced overhead by eliminating majority of nesting-induced VM exits and entries.

Intel® Xeon® Processor E5-2600 v3 Product Family
and Intel® Communications Chipset 89xx Series

	INTEL® XEON® PROCESSOR E5-2680 V3 ^a	INTEL® XEON® PROCESSOR E5-2658 V3	INTEL® XEON® PROCESSOR E5-2648L V3	INTEL® XEON® PROCESSOR E5-2640 V3	INTEL® XEON® PROCESSOR E5-2628L V3	INTEL® XEON® PROCESSOR E5-2620 V3	INTEL® XEON® PROCESSOR E5-2618L V3	INTEL® XEON® PROCESSOR E5-2609 V3	INTEL® XEON® PROCESSOR E5-2608L V3
Cores	12	12	12	8	10	6	8	6	6
CPU Core Frequency	2.5 GHz	2.2 GHz	1.8 GHz	2.6 GHz	2.0 GHz	2.4 GHz	2.3 GHz	1.9 GHz	2.0 GHz
Intel® Smart Cache (L3)	30 MB	30 MB	25MB	20 MB	25 MB	15 MB	20 MB	15 MB	15 MB
Thermal Design Power	120 W	105 W	75 W	90 W	75 W	85 W	75 W	85 W	52 W
Robust Thermal Profile (High Tcase)	Standard	87° C ¹⁰	87° C ¹⁰	Standard	87° C ¹⁰	Standard	87° C ¹⁰	Standard	88° C ¹⁰
DDR4 Memory	2133	2133	2133	1866	1866	1866	1866	1600	1866
DDR4 Memory Channels	4	4	4	4	4	4	4	4	4
PCI Express* Gen 3.0 Lanes	40	40	40	40	40	40	40	40	40
Intel® Turbo Boost Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Intel® QuickPath Interconnect Link Speed	9.6 GT/s ³	9.6 GT/s	9.6 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	8.0 GT/s	6.4 GT/s	6.4 GT/s
Intel® QuickPath Interconnect Links	2	2	2	2	2	2	2	2	2
Package	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011

INTEL® COMMUNICATIONS CHIPSET 89xx SERIES

FEATURES

BENEFITS

PCI Express* Interface	Provides up to 2.5 GT/s ³ for fast access to peripheral devices and networking with up to four PCI Express Gen 1.0 x1 ports, configurable as 4x1, 2x2, 1x2 and 2x1, or 1x4. Up to 16 lanes of PCI Express Gen 2.0 ports for access to the Intel® QuickAssist Technology
Intel® QuickAssist Technology	<ul style="list-style-type: none"> • Delivers hardware acceleration services for efficient cryptographic and compression performance. • Symmetric cryptography functions include: cipher operations (SHA-1, MD5; SHA-2 [SHA-224, SHA-256, SHA384, SHA-512]); authentication (HMAC, AES-XCBC, AES-XCBC, AES-CCM); AES-XTS (8925, 8950 and 8955 only); and random number generation. • Public Key functions include; RSA operation; Diffie-Hellman operation; digital signature standard operation; key derivation operation; elliptic curve cryptography (ECDSA and ECDH); random number generation and prime number testing. • Compression/decompression include: DEFLATE (Lempel-Ziv 77) and LZS (Lemel-Ziv-Stac).
Intel® QuickAssist Technology software support	Provides support for multiple operating systems: Linux,* KVM, open source framework patches; Yocto Project* BSPs, and Wind River Linux* 5.0 BSPs.
SATA Gen 2 ports (3 Gb/s)	Supports faster transfer rate for improved data access.
Hi-Speed Universal Serial Bus (USB) 2.0	<ul style="list-style-type: none"> • Provides greater performance enhancement with a design data rate of up to 480 Mbps. • Rate-matching hub enables lower power requirements and manages the transition of the communications data rate from the higher speed of the host controller to the lower speed of USB full-speed/low-speed devices.

Intel in Communications: intel.com/go/commsinfrastructure

Δ Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor series, not across different processor sequences. See http://www.intel.com/products/processor_number for details.

¹ Drivers available at: downloadcenter.intel.com (enter chipset name).

² Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel® Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>.

³ GT/s = Giga Transfers/second.

⁴ Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information, including details on which processors support HT Technology, visit <http://www.intel.com/info/hyperthreading>.

⁵ No computer system can provide absolute security. Requires an enabled Intel® processor and software optimized for use of the technology. Consult your system manufacturer and/or software vendor for more information.

⁶ No computer system can provide absolute security. Requires an enabled Intel® processor, enabled chipset, firmware, and software, and may require a subscription with a capable service provider (may not be available in all countries). Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. Consult your service provider for availability and functionality. For more information, visit <http://www.intel.com/go/anti-theft>. Consult your system manufacturer and/or software vendor for more information.

⁷ No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer system with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules, and an Intel TXT-compatible measured launched environment (MLE). The MLE could consist of a virtual machine monitor, an OS, or an application. In addition, Intel TXT requires the system to contain a TPM v1.2, as defined by the Trusted Computing Group and specific software for some uses. For more information, see intel.com/technology/security.

⁸ Intel® AES-NI requires a computer system with an AES-NI-enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on select Intel® processors. For availability, consult your reseller or system manufacturer. For more information, see <http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni/>.

⁹ Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, and virtual machine monitor (VMM). Functionality, performance, or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit <http://www.intel.com/go/virtualization>.

¹⁰ Not to exceed 360 hours per year.

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