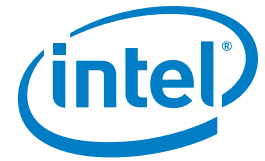


PLATFORM BRIEF

Intel® Xeon® Processor E5-2600 v2 Product Family
and Intel® Communications Chipset 89xx Series
Communications Infrastructure



Intel® Xeon® Processor E5-2600 v2-Based Platforms for Large-Scale Communications Infrastructure Systems

The Intel® Xeon® processor E5-2600 v2 product family, paired with the Intel® Communications Chipset 89xx series with Intel® QuickAssist Technology, provides hardware-based acceleration and the general-purpose processing needed for communications workloads.



Product Overview

Based on Intel® microarchitecture, code-name Ivy Bridge, and manufactured on industry-leading 22nm process technology with 3D Tri-Gate transistors, this is the first Intel® Xeon® processor family with extended life cycle support to offer 10-core/single-socket to 20-core/dual-socket configurations. These processors provide significant performance and power efficiency improvement over the previous-generation Intel® Xeon® processor E5-2600 product family.

When pairing these processors with the Intel® Communications Chipset 89xx series, this platform provides hardware-based acceleration and the general purpose processing needed for communications workloads. The chipset series provides hardware-based cryptographic and compression acceleration capabilities for a wide range of communications infrastructure applications, such as high-end security appliances, enterprise routers, and wireless infrastructure. The Intel® Data Plane Development Kit (Intel® DPDK) complements the platform by improving packet processing speeds to handle increasing network traffic data rates and associated infrastructure control/signaling requirements.

A range of processor options allows developers to create a family of products based on one design. Processors with ten cores (20 threads), eight cores (16 threads), and six cores (12 threads) provide not only core scalability but also a thermal design power range of 50 W to 115 W.

Robust thermal profiles make these processors ideal for thermally constrained applications such as the AdvancedTCA* form factor and solutions requiring compliance with NEBS Level 3 thermal specifications.

To deliver top performance for bandwidth-intensive applications, these processors feature Intel® Virtualization Technology¹ for flexible virtualization, two Intel® QuickPath Interconnect (Intel® QPI) links, Intel® Turbo Boost Technology,² and Intel® Hyper-Threading Technology.³

The Intel Communications Chipset 89xx series includes Intel® QuickAssist Technology for improved cryptographic and compression performance. This technology provides hardware acceleration to assist with the performance demands of securing and routing Internet traffic and other workloads such as compression and wireless 3G/4G LTE algorithm offload, thereby reserving processor cycles for application and control processing. (Please see page 3 for a detailed list of features.)

The chipset series also provides hardware offload assistance up to 50 Gbps for virtual private networks (VPNs) and helps storage and network optimization applications better handle compression and decompression tasks. Kasumi and Snow 3G functions within Intel QuickAssist Technology help with 3G and 4G LTE mobile gateway and infrastructure workloads. Four integrated 10/100/1000 GbE MACs (on select SKUs) save board real estate and BOM costs over previous-generation Intel chipsets.

Platform Highlights

Automated energy efficiency reduces idle power consumption - Integrated power gates allow idling cores to be reduced to near-zero power, independent of other cores. Automated low-power states put the processor, memory, and I/O controller into the lowest available power states that will meet the requirements of the current workload.

Embedded ecosystem support - From modular components to market-ready systems, Intel and the 250+ global member companies of the Intel® Intelligent Systems Alliance (intel.com/go/intelligentsystems-alliance), provide the performance, connectivity, manageability, and security developers need to create smart, connected systems.

Extended life cycle product support - Protects system investment by enabling extended product availability for communications customers.

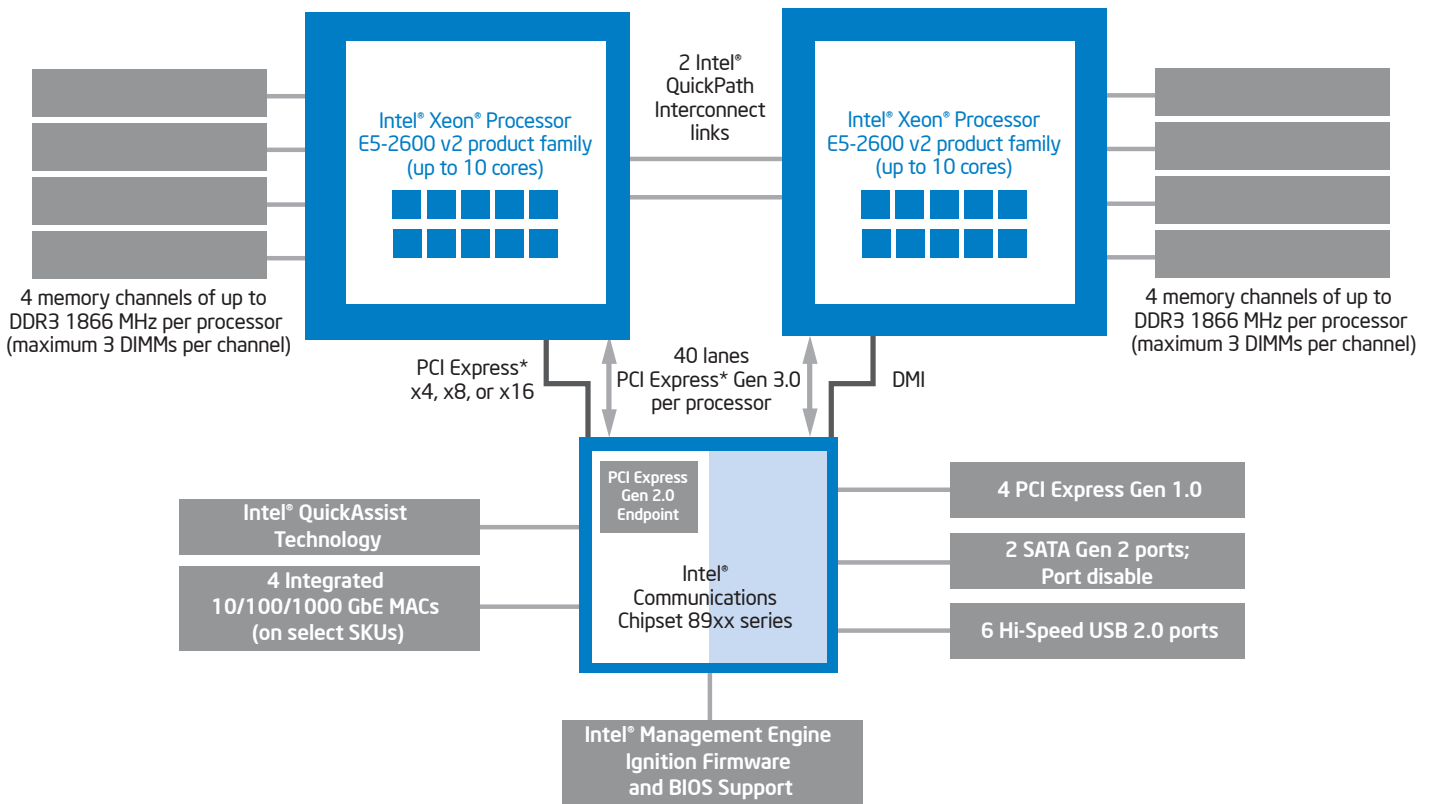


Figure 1. Dual-socket (shown) or single-socket configurations of the Intel® Xeon® processor E5-2600 v2 product family with the Intel® Communications Chipset 89xx series are ideal for large-scale communications infrastructure systems.

Software Overview

The following independent operating system and BIOS vendors provide support for this platform:

OPERATING SYSTEM

Linux* (validated with Fedora 16)

CONTACT

Intel provides drivers⁴

BIOS

American Megatrends
Insyde Software
Phoenix Technologies

Intel® Xeon® Processor E5-2600 v2 Product Family for Large-Scale Communications Infrastructure Systems

FEATURES	BENEFITS
Low-power 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).
Integrated PCI Express* Gen 3.0 on processor die	<ul style="list-style-type: none"> • Allows developer to build high-bandwidth applications that can benefit from PCI Express Gen 3.0 speeds.
Large Intel® Smart Cache (L3)	<ul style="list-style-type: none"> • 2.5 MB per core boosts performance while reducing traffic to the processor cores.
Intel® Turbo Boost Technology ²	<ul style="list-style-type: none"> • Boosts performance for specific workloads by increasing processor frequency.
Intel® QuickPath Interconnect	<ul style="list-style-type: none"> • Supports up to 8.0 GT/s⁷ to enable high-performance, dual-socket designs.
Intel® Hyper-Threading Technology ³	<ul style="list-style-type: none"> • Helps boost performance for parallel multi-threaded applications.
Intel® Advanced Vector Extensions (Float 16)	<ul style="list-style-type: none"> • Accelerates integer/matrix compute performance for signal- and image-processing applications. • Supports Float 16 half-precision data type; improves AVX performance for applications that convert to or from 16-bit and 32-bit floating point.
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.
Intel® Data Protection Technology ⁵ with Secure Key	<ul style="list-style-type: none"> • Provides faster and more secure encryption to help protect media, data, and assets from loss.
Intel® Platform Protection Technology ⁶ with OS Guard	<ul style="list-style-type: none"> • Enhances protection against malware by preventing execution of calls to the OS from compromised applications in the user mode or code pages.
Intel® Virtualization Technology ¹ (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)	<ul style="list-style-type: none"> • 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.

Intel® Communications Chipset 89xx Series

FEATURES	BENEFITS
PCI Express* Interface	<ul style="list-style-type: none"> • Provides up to 2.5 GT/s⁵ 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 (AES, DES, 3DES, ARC4); wireless (Kasumi, Snow 3G); hash/authenticate operations (SHA-1, MD5; SHA-2 [SHA-224, SHA-256, SHA-384, SHA-512]); authentication (HMAC, 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 (Lempel-Ziv-Stac).
Intel® QuickAssist Technology software support	<ul style="list-style-type: none"> • Provides support for multiple operating systems: Linux*, KVM, open source framework patches, Yocto Project* BSPs, and Wind River Linux* 5.0 BSPs.
Four integrated 10/100/1000 GbE MACs (on select SKUs)	<ul style="list-style-type: none"> • Simplifies reuse; compatible with standard Intel® Ethernet drivers.
SATA Gen 2 ports (3 Gb/s)	<ul style="list-style-type: none"> • 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® Management Engine Ignition Firmware	<ul style="list-style-type: none"> • Supports essential platform functionality such as thermal reporting.

Intel® Xeon® Processor E5-2600 v2 Product Family for Large-Scale Communications Infrastructure Systems

PRODUCT NAME ^A	INTEL® XEON® PROCESSOR E5-2680 v2	INTEL® XEON® PROCESSOR E5-2658 v2	INTEL® XEON® PROCESSOR E5-2648L v2	INTEL® XEON® PROCESSOR E5-2640 v2	INTEL® XEON® PROCESSOR E5-2628L v2	INTEL® XEON® PROCESSOR E5-2630 v2	INTEL® XEON® PROCESSOR E5-2618L v2
Cores	10	10	10	8	8	6	6
CPU Core Frequency	2.8 GHz	2.4 GHz	1.9 GHz	2.0 GHz	1.9 GHz	2.6 GHz	2.0 GHz
Intel® Smart Cache (L3)	25 MB	25 MB	25 MB	20 MB	20 MB	15 MB	15 MB
Thermal Design Power	115 W	95 W	70 W	95 W	70 W	80 W	50 W
Robust Thermal Profile (High Tcase)	Standard	87° C ⁹	92° C ⁹	Standard	92° C ⁹	Standard	93° C ⁹
DDR3 Memory	1866	1866	1866	1600	1600	1600	1333
DDR3 Memory Channels	4	4	4	4	4	4	4
PCI Express* Gen 3.0 Lanes	40	40	40	40	40	40	40
Intel® Turbo Boost Technology	Yes	Yes	Yes	Yes	Yes	Yes	No
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intel® QuickPath Interconnect Link Speed ⁷	8.0 GT/s	8.0 GT/s	8.0 GT/s	7.2 GT/s	7.2 GT/s	7.2 GT/s	6.4 GT/s
Intel® QuickPath Interconnect Links	2	2	2	2	2	2	2
Package	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011	LGA 2011

Intel® Communications Chipset 89xx Series

PRODUCT NUMBER	8955	8950	8925	8920	8910	8903	8900
Intel® QuickAssist Technology	Up to 50 Gbps	Up to 50 Gbps	Up to 25 Gbps	Up to 20 Gbps	Up to 10 Gbps	Up to 5 Gbps	None
▪ RSA 2K-bit exponent	Up to 40 K operations per second						None
▪ Compression	Up to 24 Gbps						None
Thermal Design Power	20 W	20 W	17 W	12 W	11 W	9.5 W	8.5 W
PCI Express* Gen 2.0 Endpoint	x16	x16	x16	x16	x8	x4	x4
PCI Express Gen 1.0	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4	4x1, 2x2, 1x2/2x1, or 1x4
SATA Gen 2 ports (3 Gb/s)	2	2	2	2	2	2	2
Hi-Speed USB 2.0 ports	6	6	6	6	6	6	6
Integrated Gigabit Ethernet Controller (MAC)	None	None	None	4	4	4	4
GPIO pins (multiplexed or dedicated)	68	68	68	68	68	68	68
Package	FCBGA: 27mm x 27mm with 0.7mm variable pitch						

Intel in Communications: intel.com/go/commsinfrastructure

^A Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families: Go to: http://www.intel.com/products/processor_number.

¹ 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>.

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 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>.

⁴ Drivers available at: downloadcenter.intel.com (enter chipset name).

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 GT/s = Giga Transfers/second.

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 Intel® Advanced Encryption Standard Instructions (AES-NI).

⁹ Not to exceed 360 hours per year.

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