PRODUCT BRIEF
DATA CENTER
AND CLOUD

POWERFUL, DENSE 4-SOCKET SERVERS FOR NEXT-GENERATION DATA CENTER AND CLOUD DEPLOYMENTS

Intel® Xeon® Processor E5-4600 v4 Product Family

Expand your computing capacity for powerful, high-density virtual machine and cloud deployments in a single four-socket server based on the Intel® Xeon® processor E5-4600 v4 product family. With up to 22 cores and 44 threads these servers offer more processing power for scaling up and out very large workloads, along with hardware-enhanced Intel® technologies that can help you monitor, secure, and orchestrate your data center resources more effectively. The value of Intel® Xeon® processor E5 v4 family-based 4-socket server platforms give you greater flexibility to scale and more control of your IT environments for growing your business.

Enhanced Performance for Demanding Workloads

The Intel Xeon processor E5-4600 v4 product family delivers up to 2.6X1 performance increase over similar servers that are at least four years old. In addition to increased core and thread counts, these new server platforms provide up to 55 MB of last-level cache, support up to 6 TB of DDR4 2400 (maximum speed) memory, and 40 lanes of PCIe* 3.0. With these advancements, you can deliver faster application response times and support more complex workloads on fewer servers.

All workloads—not just floating-point heavy workloads—benefit from the new optimized Intel® Advanced Vector Extensions 2.0 (Intel® AVX2). When Intel AVX2 operations run on a core, other cores executing non-Intel AVX2 workloads at their maximum turbo frequency are not affected, maintaining turbo performance and enhanced responsiveness for applications that need it.

Hardware-Enhanced Security Technologies Protect Your Data and Platforms

Security is more important than ever in today's virtualized data centers and clouds. The Intel Xeon processor E5-4600 v4 family includes integrated security technologies that can help you protect your data, software, and hardware more effectively. In addition to accelerated AES encryption with Intel® Advanced Encryption Standard New Instructions, you get fast public key (RSA) encryption and strong random number generation, enabling hardened, pervasive data protection while maintaining fast application response times. Intel Xeon processor E5-4600 v4 family also provides enhanced ability to detect stealthy malicious software to help prevent common attack vectors against operating environments.

Efficient Power Management for the Data Center

Minimizing power consumption is important in keeping rising utility costs under control. Intel® Intelligent Power technology dynamically optimizes power across the CPU and memory, and now supports per-core P states (PCPS), which independently optimize power for each individual processor core. You can also take advantage of Intel® Node Manager and Intel® Data Center Manager to improve power and thermal management at multiple levels, from individual servers to racks, rows, and entire data centers.

Smart, Flexible Resource Orchestration Support Increased Operational Efficiency

More and more IT organizations are engaging Software-Defined Infrastructure (SDI) to improve service levels and resource utilization. The Intel Xeon processor E5-4600 v4 product family brings advanced functionality and built-in intelligence that can help you deliver better results with less effort.

With Intel® Resource Director Technology, software-guided hardware capabilities intelligently monitor and control the allocation of key shared system resources to help ensure quality of service (QoS) and deliver monitoring insight and control where you need it.

Cache monitoring, for example, provides visibility into one of the most critical shared resources in virtualized servers. You can now identify and move "noisy neighbor" virtual machines (VMs) before they compromise performance.

You can also take advantage of integrated telemetry and Intel® Node Manager to access real-time data on server power, thermal, and utilization status, so you have better information for managing and orchestrating resources.

High-performance virtualization lays the foundation for data center agility, and the Intel Xeon processor E5-4600 v4 product family provides new virtualization features, including the following:

- VM Enter/Exit Latency Reduction—Reduces[2] overhead of VM transitions.
- Posted Interrupts—Provides fewer VM-exits and enables efficient co-migration of interrupts with virtual processors.
- Page Modification Logging—For better availability of VMs.

Higher Value through Complete Platform Solutions

Optimizing performance and utilization in today's complex data centers and clouds requires a balanced platform to avoid bottlenecks. Intel offers complete storage and networking solutions that can help you unleash the full capability of each server.

The Intel® Solid-State Drive (Intel® SSD) Data Center Family for PCIe delivers up to 5x the throughput of SATA SSDs,[3] with enterprise-class reliability, endurance, and data protection.

The Intel® Ethernet Controller XL710 (40 GbE) provides flexible, high-performance network connectivity to keep data flowing more quickly, even in dense, virtualized environments.

Intel® QuickAssist Technology offloads cryptographic and data compression workloads to dedicated accelerators to improve performance, while freeing up CPU cycles for improved scalability.

INTEL® XEON® PROCESSOR E5-4600 V4 PRODUCT FAMILY SPECIFICATIONS

Intel® Xeon® processor SKU	Frequency (GHz)	Cache	Power	Cores	DDR4 Memory Speed	Intel® Turbo Boost Technology	Intel® HT Technology	Intel® QPI Link Speed
E5-4669 v4	2.2	55M	135 W	22	2400	●	●	9.6 GT/s
E5-4667 v4	2.2	45M	135 W	18	2400	●	●	9.6 GT/s
E5-4660 v4	2.2	40M	120 W	16	2400	●	●	9.6 GT/s
E5-4655 v4	2.5	30M	135 W	8	2400	●	●	9.6 GT/s
E5-4650 v4	2.2	35M	105 W	14	2400	●	●	9.6 GT/s
E5-4628L v4**	1.8	35M	75 W	14	2133	●	●	8.0 GT/s
E5-4640 v4	2.1	30M	105W	12	2133	●	●	8.0 GT/s
E5-4620 v4	2.1	25M	105 W	10	2133	●	●	8.0 GT/s
E5-4610 v4	1.8	25M	105 W	10	1866	No Turbo	●	6.4 GT/s
E5-4627 v4	2.6	25M	135 W	10	2400	●	HT Off	9.6 GT/s

** This is a storage and comms SKU.

INTEL® XEON® PROCESSOR E5-4600 v4 PRODUCT FAMILY OVERVIEW	
FEATURES	**BENEFITS**
Advanced multi-core, multi-threaded processing	• Up to 22 cores (previously up to 18) and 44 threads (previously up to 36) per socket for running more and heavier workloads and higher density of virtual machines per server
Larger cache and faster memory	• Up to 55 MB (Previously up to 45 MB) of last level cache for fast access to frequently used data • Up to 48 DIMMS per four-socket server for memory-intensive applications • Faster maximum memory speeds with DDR4 memory (2400 versus 2133 MHz)
Higher performance for demanding workloads	• Optimized Intel® Advanced Vector Extensions 2.0 (Intel® AVX 2.0) enables applications to run at maximum "turbo" frequencies wherever possible across workloads • Intel® Turbo Boost Technology 2.0 acceleration takes advantage of power and thermal headroom
Flexible, high-performance, hardware-enhanced virtualization	• Improve overall reliability and responsiveness through new Intel® Virtualization Technology features, including New Posted Interrupts, Page Modification Logging, and VM Enter/Exit latency reduction
Advanced RAS features	• Multiple rank sparing DDR4 recovery for command and address parity errors
Strong, fast, hardened data encryption and malware protection	Intel® Data Protection Technology with: • Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) and RSA public key encryption for pervasive data encryption without sacrificing application response times • Secure Key for high-quality encryption keys that provide better protection against sophisticated side channel attacks (e.g., side channel penetration)
A better foundation for secure multitenancy infrastructure	Intel® Platform Protection Technology with: • Intel® Trusted Execution Technology (Intel® TXT) for establishing trusted infrastructure that can only launch into known good states • OS Guard and BIOS Guard for stronger platform-level security
Industry-leading energy efficiency	• Intel® Intelligent Power Technology and Per-Core P States dynamically manage CPU and memory energy states to reduce power without slowing performance
Smarter resource orchestration for enhanced IT infrastructure controls	• Intel® Resource Director Technology provides software-guided hardware capabilities to intelligently monitor and control the allocation of key shared system resources to help ensure quality of service (QoS) and deliver monitoring insight and control where you need it

4-SOCKET
Server Platforms

Intel® QuickAssist Technology

FAST
encryption and compression

HIGH MEMORY
Bandwidth

To learn more about the Intel Xeon processor E5-4600 v4 product family, **visit www.intel.com/xeonE5**.

[1] 1-Node, 4 x Intel® Xeon® Processor E5-4650 on Lizard Head Pass with 256 GB Total Memory on Red Hat Enterprise Linux* 6.2 kernel 2.6.32-220 using Workload version: SPECCPU v1.2, ic12.1.09oct2011 , speed test without numactl. Data Source: Intel Request Number: 477, SPECint*_rate_base2006 score: 1170 Higher is better.
Estimate: Results have been estimated or measured based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance. Configuration: 1-Node, 4 x Intel® Xeon® Processor E5-4669 v4, SMT enabled, Turbo enabled, Memory @ up to 2400 MHz, SPEC CPU*2006 binary (IC14.0). SPECint*_rate_base2006 estimate: 3080 Higher is better.

[2] Results have been estimated or simulated by Intel based on software, benchmark or other data of third parties and are provided for informational purposes only.
Any difference in system hardware or software design or configuration may affect actual performance.

[2] Based on the Intel® Solid-State Drive Data Center P3700 and the Intel® Solid-State Drive Data Center S3700 Series Product Specifications.
For more information, visit http://www.intel.com/ content/www/us/en/solid-state-drives/intel-ssd-dc-family-for-pcie.html
For more complete information visit http://www.intel.com/performance/datacenter.

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