



PRODUCT BRIEF

Intel® Xeon® Processor D-1500 Product Family

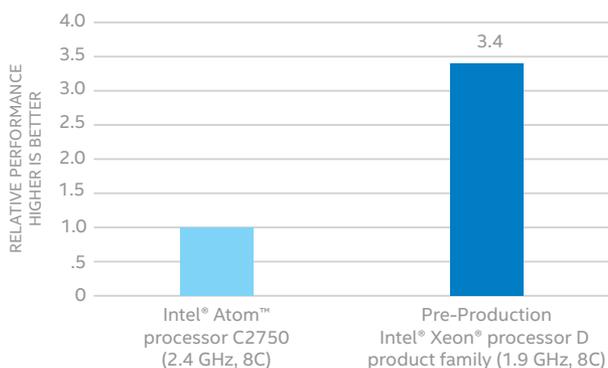


Extending Intelligence to the Edge

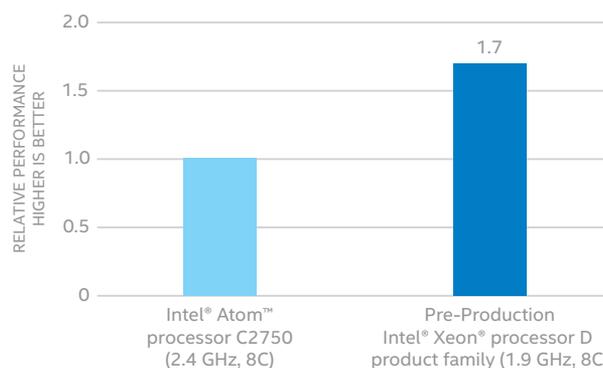
As cloud, telecommunications service providers, and hosters seek to speed new service delivery and handle exponential growth in the number of users accessing their services, it is essential that they optimize infrastructure for density and cost, both in the data center and at the network edge. Inefficient data center scaling drives up space and cost and increases environmental impact, while fixed function, proprietary devices at the network edge hinder the ability of IT to rapidly deploy and manage new services.

The Intel® Xeon® processor D family offers new options for infrastructure optimization, by bringing the performance and advanced intelligence of Intel® Xeon® processors into a dense, lower-power system-on-a-chip. The Intel Xeon processor D product family is Intel's 3rd generation 64-bit SoC and the first based on Intel Xeon processor technology. It can be deployed for a variety of workloads including dynamic web serving, dedicated web hosting, warm storage, network routing, and more.

Performance Dynamic Web Serving



Performance per Watt Dynamic Web Serving



UP TO 1.7X BETTER PERFORMANCE PER WATT THAN INTEL® ATOM™ PROCESSOR C2750 FAMILY

The Intel® Xeon® processor D-1500 product family provides up to 3.4x the performance^{1,3} of the Intel® Atom™ processor C2750 with up to 1.7x the performance per watt^{2,3}.

Based on Intel's industry-leading 14 nm silicon technology, the Intel® Xeon® processor D-1500 product family is the first offering of a line of processors that will address a broad range of low-power, high-density infrastructure needs. Currently available with 4 or 8 cores and 128 GB of addressable memory, this system on a chip (SoC) has an integrated platform controller hub (PCH), integrated I/O, two integrated 10 Gigabit Intel® Ethernet ports, and a thermal design point (TDP) of ~20 watts to 45 watts. It can run the same instruction set as more robust Intel Xeon processors to provide software consistency from the data center to the network edge. It also provides advanced server-class capabilities, including:

- **Intel x86 64-bit Software Support** for scalable performance and broad application compatibility.
- **Enhanced Reliability, Availability, and Serviceability (RAS) features**, including support for error-correcting code (ECC) memory and platform-level error management and resilience.
- **Intel® Platform Storage Extensions** to enable smarter and more cost-effective storage solutions through integrated technologies that accelerate data movement, protect data, and simplify data management.
- **Built-in Hardware Virtualization** to enable dynamic provisioning of services as telco service providers extend network functions virtualization (NFV) to the network edge.
- **Fast Encryption and Decryption** Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI) accelerates data encryption and decryption for secure web sites.

Extending Intelligence to the Network Edge

As Network traffic volume and complexity increases, operators must both optimize their infrastructure and increase value-added services to drive revenue. This requires more compute capability at all points of the network including the edge. These highly scalable, compact, and energy efficient SoCs are an ideal solution for TEMs and OEMs seeking the best performance per watt. The high level of integration including two integrated 10 GbE Ethernet ports and support for hardware-assisted virtualization makes this a very attractive option for wireless base stations, routers and switches, security and network appliances, as well as the build-out of Software Defined Networking (SDN) and Network Functions Virtualization (NFV).

Ideal for Lightweight Hyperscale Workloads

The Intel Xeon processor D family provides excellent performance and software compatibility in a low-power SoC, for microservers that can efficiently process lightweight, hyperscale workloads in cloud service provider data centers and dedicated hosting company data centers. These SoCs offer a significant step up from the Intel® Atom™ processor C2750 SoC, delivering up to 3.4 times the performance per node^{1,3} and up to 1.7x estimated better performance per watt.^{2,3} With exceptional node performance, up to 12 MB of last level cache, and support for up to 128 Gigabytes of high-speed DDR4 memory, these SoCs are ideal for emerging lightweight hyper-scale workloads, including memory caching, dynamic web serving, and dedicated hosting.

Intelligent, High-Efficiency Storage for the Data Center and Beyond

With Intel® Platform Storage Extensions, the Intel Xeon processor D family offers new intelligence for dense, low-power storage solutions that can be deployed in or out of the data center. Non-transparent bridging (NTB) enables high-speed connectivity among Intel Xeon processor-based platforms for failover support; Asynchronous DRAM Self-Refresh (ADR) helps to protect data in the event of a power outage; and Intel® QuickData technology offloads memory accesses to the SoC for fast data movement with low processor overhead.

More to Come

The 4- and 8-core SoCs of the Intel Xeon processor D-1500 product family are available today and a more comprehensive lineup is planned for release in the second half of 2015. These powerful, intelligent SoCs will provide a range of options to address the growing need for low-power, high density infrastructure solutions in both data centers and edge networks. Cloud and telecommunications service providers will have an increasing range of options for expanding capability and reducing costs without limiting software compatibility.

INTEL® XEON® PROCESSOR D PRODUCT FAMILY OVERVIEW

Intel® Xeon® Processor Intelligence in a Low-Power SoC	Up to 3.4x higher performance per node ^{1,3} versus Intel® Atom™ processor C2750-based solutions. Includes up to 8 cores, two integrated ports of 10 Gigabit Intel® Ethernet, plus support for up to 128 GB of memory. Also includes Intel® 64-bit software support ⁴ , L1 cache (32K data, 32K instructions per core), L2 cache (256K per core), LLC cache (1.5 MB per core), Intel® Turbo Boost Technology ⁴ , and Intel® Hyper-Threading Technology ⁴ .
Industry-Leading 14 nm Process Technology	Enables dense, low power system designs with thermal design points of ~20W to 45W and system level performance per watt of up to 1.7x that of Intel Atom processor C2750-based solutions ^{2,3} .
Server-Class Reliability, Availability, and Serviceability (RAS)	Provides high system reliability and data integrity with support for error correction code (ECC) memory, single device data correction (SDDC), memory demand and patrol scrubbing, and much more.
Built-In Intel® Virtualization Technology	Delivers near-native compute and I/O performance in virtualized data centers, network infrastructure, and cloud computing, with advanced monitoring of cache and memory bandwidth for better service level and infrastructure management.
Hardware-Enhanced Security and Compliance	Intel Advanced Encryption Standard New Instructions (Intel AES-NI) provide integrated support for fast, low-overhead encryption and Intel® Trusted Execution Technology (Intel® TXT) provides platform verification (through authenticated boot) to enable strong security with reduced performance impact.
Server-Class Manageability	Includes Intel® Node Manager Base for adaptive power management.
Intel® Platform Storage Extensions	Enables fast data movement and high availability through integrated support for non-transparent bridging (NTB), asynchronous DRAM self-refresh (ADR), and Intel® QuickData technology, which provides a direct memory access (DMA) engine within the SoC.

INTEL® XEON® PROCESSOR D-1500 PRODUCT FAMILY

	INTEL® XEON® PROCESSOR D-1540	INTEL® XEON® PROCESSOR D-1520
Thermal Design Point	45W	45W
Frequency	2.0 GHz	2.2 GHz
Cores	8	4
Memory Channels	2	2
DIMMS per Channel	2	2
DRAM Interface	ECC (DDR4)	ECC (DDR4)
Max. Memory Speed	2133 MT/s	2133 MT/s
Max. DRAM Capacity	128 GB	128 GB
Integrated I/O	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3	24 PCIe 3.0* 8 PCIe 2.0* x4 USB 3.0 x4 USB 2.0 x6 SATA 3
Network Interface	2 x 1/2.5/10 GbE Intel Ethernet	2 x 1/2.5/10 GbE Intel Ethernet
Built-In Intel® Virtualization Technology	VT-x, VT-d, and Cache QoS	VT-x, VT-d, and Cache QoS
Cache Hierarchy	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)	L1 (32K data, 32K instructions per core) L2 (256K per core) LLC (1.5 MB per core)



FOR MORE INFORMATION

on the Intel® Xeon® processor D product family, visit www.intel.com/xeond.

¹ Up to 3.4x better performance on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 1.9GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBBase-T X552, 3x S3700 SATA SSD, Fedora® 20 (3.17.8-200.fc20.x86_64, Nginx® 1.4.4, Php-fpm® 15.4.14, memcached® 1.4.14, Simultaneous users=43844 Supermicro SuperServer® 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBBase-T X520, 2x S3700 SATA SSD, Ubuntu® 14.10(3.16.0-23 generic), Nginx® 1.4.4, Php-fpm® 15.4.14, memcached® 1.4.14, Simultaneous users=12896.

² Up to 1.7x (estimated) better performance per watt on Dynamic Web Serving Intel® Xeon Processor D-based reference platform with one Xeon Processor D (8C, 1.9GHz, 45W, ES2), Turbo Boost Enabled, Hyper-Threading enabled, 64GB memory (4x16GB DDR4-2133 RDIMM ECC), 2x10GBBase-T X552, 3x S3700 SATA SSD, Fedora® 20 (3.17.8-200.fc20.x86_64, Nginx® 1.4.4, Php-fpm® 15.4.14, memcached® 1.4.14, Simultaneous users=43844, Estimated wall power based on microserver chassis, power=90W, Perf/W=487.15 users/W Supermicro SuperServer® 5018A-TN4 with one Intel Atom Processor C2750 (8C, 2.4GHz,20W), Turbo Boost Enabled, 32GB memory (4x8GB DDR3-1600 SO-DIMM ECC), 1x10GBBase-T X520, 2x S3700 SATA SSD, Ubuntu® 14.10 (3.16.0-23 generic), Nginx® 1.4.4, Php-fpm® 15.4.14, memcached® 1.4.14, Simultaneous users=12896. Maximum wall power =46W, Perf/W=280.3 users/W

³ 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.

⁴ Intel technologies may require enabled hardware, specific software, or services activation. Check with your system manufacturer or retailer.

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