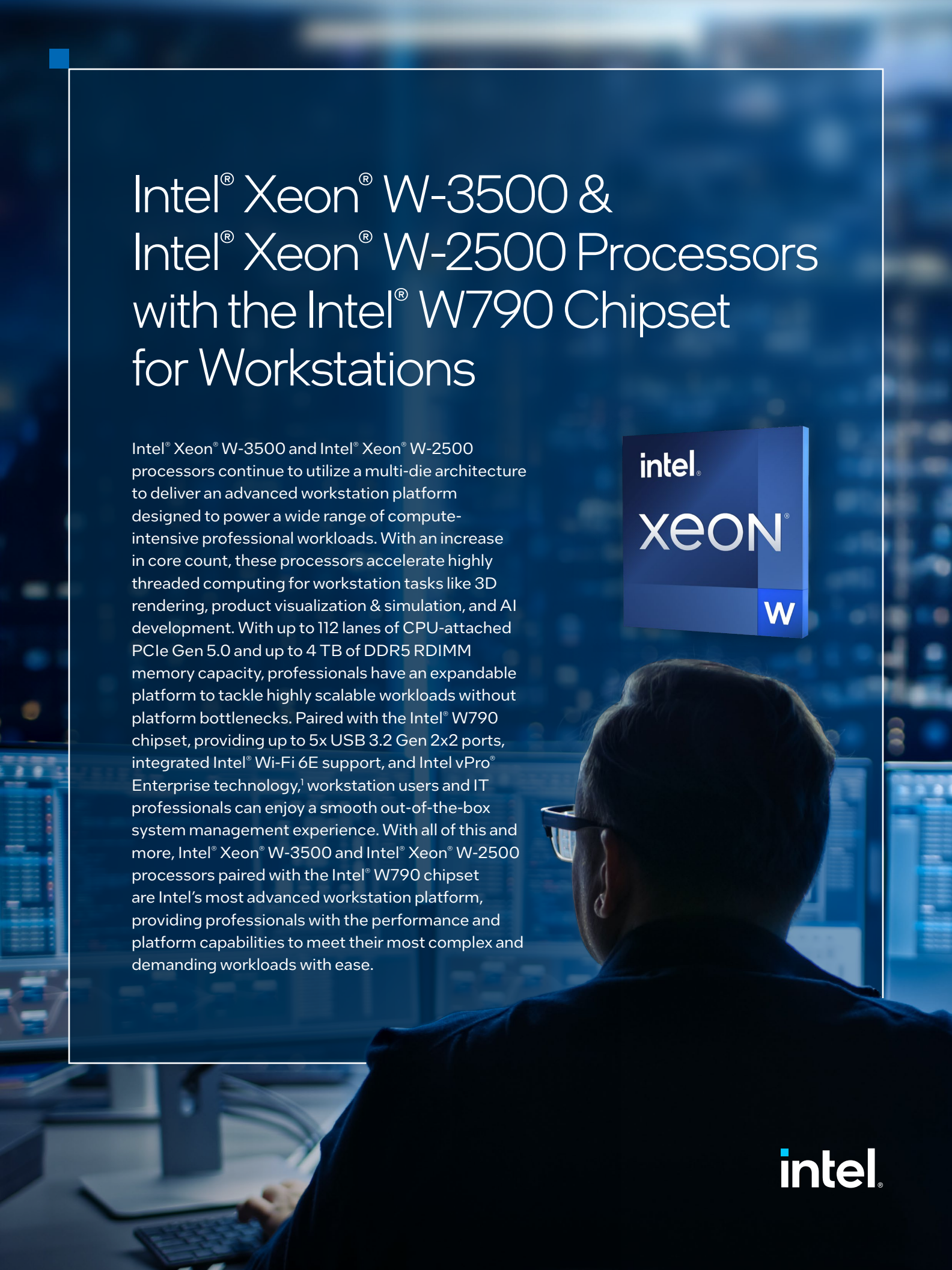
Intel® Xeon® W-3500 & Intel® Xeon® W-2500 Processors with the Intel® W790 Chipset for Workstations

Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processors continue to utilize a multi-die architecture to deliver an advanced workstation platform designed to power a wide range of compute-intensive professional workloads. With an increase in core count, these processors accelerate highly threaded computing for workstation tasks like 3D rendering, product visualization & simulation, and AI development. With up to 112 lanes of CPU-attached PCIe Gen 5.0 and up to 4 TB of DDR5 RDIMM memory capacity, professionals have an expandable platform to tackle highly scalable workloads without platform bottlenecks. Paired with the Intel® W790 chipset, providing up to 5x USB 3.2 Gen 2x2 ports, integrated Intel® Wi-Fi 6E support, and Intel vPro® Enterprise technology,[1] workstation users and IT professionals can enjoy a smooth out-of-the-box system management experience. With all of this and more, Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processors paired with the Intel® W790 chipset are Intel's most advanced workstation platform, providing professionals with the performance and platform capabilities to meet their most complex and demanding workloads with ease.



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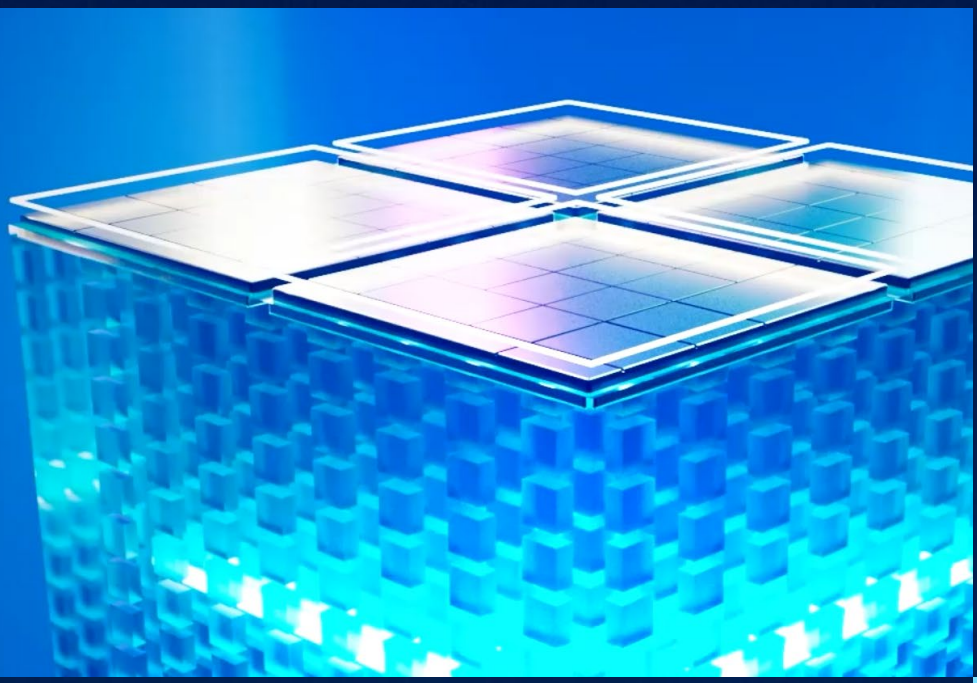
Expanded Compute Architecture

Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processors continue to deliver the performance and scalability to power professional high-end computing needs. These processors utilize an advanced CPU packaging technology featuring Embedded Multi-die Interconnect Bridge (EMIB) technology, which elegantly connects multiple heterogeneous dies in a single solution, alleviating processing bottlenecks and enabling up to 60 cores in a single socket. With increased core counts over the previous generation of Intel® Xeon® W processors, professionals can manage even more compute-intensive, highly threaded workflows. At the same time, CPU speeds of up to 4.8 GHz with Intel® Turbo Boost Max Technology 3.0 optimize core performance on-demand for lightly threaded applications, increasing system responsiveness. An expanded Intel® Smart Cache of up to 112.5 MB reduces latency in complex workloads, like code compilation or rendering, by reducing the amount of time spent swapping data between cache and memory. With this expanded compute architecture designed to optimize CPU performance across workloads, it enables creatives, engineers, and data scientists to work at their best.

Designed for AI Development

Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processors are built for AI development with advanced CPU and platform features designed to accelerate artificial intelligence (AI) and machine learning (ML) workflows. Accelerate CPU-based inferencing workloads end-to-end with accelerators built into the core architecture such as Intel® Advanced Matrix Instructions (Intel® AMX) and Intel® Advanced Vector Instructions 512 (Intel® AVX-512), which enable more efficient deep learning acceleration for preparation, training, and inferencing of AI models. Additionally, the numerous CPU-attached PCIe 5.0 lanes of the platform enable data scientists and AI researchers to experiment with multiple high-speed GPU machine learning model training and tuning ahead of AI model deployment. Data scientists can also maximize their computing with Intel® software development tools, libraries, and frameworks powered by oneAPI, which provide optimization for Intel® hardware. Thanks to these acceleration tools, in combination with world-class platform capabilities, data scientists and AI developers can experience smoother AI model development and faster data analysis.



Built for Business with Intel vPro®

Workstations based on Intel® Xeon® W-3500 and Intel® Xeon® W-2500 platforms provide a suite of professional-grade features to power a smooth system experience so that workstation professionals can dive fearlessly into their workflows. Guard against system errors to help protect and improve the integrity of critical data without workflow interruption with support for DDR5 RDIMM Error Correcting-Code (ECC) Memory. Protect system reliability and boost productivity by minimizing costly downtime with supported reliability, availability, and serviceability (RAS) features. Additionally, support for select Intel vPro® Enterprise technology[1] enables a seamless, reliable, and secure system management experience so that enterprises can operate efficiently with peace of mind. Boost security for virtualized environments with Intel® VT-Redirect Protection (Intel® VT-rp), which offers hardware-enabled protection for the Windows kernel. With Intel® Firmware Version Control (FVC), enterprises benefit from additional system stability that prevents the re-installation of older firmware. Premier system management capabilities—including Intel® Active Management Technology, Intel® Platform Trust Technology, and Intel® Boot Guard—empower IT professionals to manage and secure their enterprise systems from wherever they are. With these comprehensive platform features, Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processors elevate workflow performance to drive the future of professional excellence.

Advanced Platform Technologies

Complemented by a full range of next-generation technologies, Intel® Xeon® W-3500 and Intel® Xeon® W-2500 processor-based workstation platforms enable professionals to work, connect, analyze, and create like never before. With up to 112 lanes of CPU-attached PCIe Gen 5.0, users can equip their desired combination of high-speed network cards, graphics accelerators, and large-volume storage arrays without system bottlenecks. With up to 8 channels of DDR5 RDIMM memory[2], users can equip up to 4 TB of memory capacity to tackle a wide array of memory-intensive workloads such as data science, AI, and machine learning development or large and complex engineering simulations. Additionally, the Intel® W790 Chipset features 16 PCIe Gen 4.0 lanes for high-speed access to even more NVMe storage for commonly used reference files. Access important data on-demand to meet deadlines with integrated Intel® Wi-Fi 6E and 2.5 GbE wired network connectivity and get a productivity boost with support for up to 5 USB 3.2 Gen 2x2 (20G) ports to transfer large videos and project files or larger data sets between devices. With these technologies and other world-class platform innovations, professionals can leverage the flexibility, expandability, and performance they need to succeed.

Intel® Xeon® W-3500 and Intel® Xeon® W-2500 Processor Features at a Glance

Feature	Benefit
Expanded Core Architecture	Continuing to utilize Embedded Multi-die Interconnect Bridge (EMIB) packaging technology to deliver a scalable architecture, increasing core counts in a single socket for the next generation of workstations.
Up to DDR5 ECC RDIMM 4800 MT/s[2]	Delivers up to 4 TB of memory support for power savings, faster memory speeds, and higher memory bandwidth.
PCIe 5.0 up to 112 Lanes	Offers readiness for up to 224 GT/s for fast access to peripheral devices and networking with up to 112 PCI Express 5.0 lanes.
Increased L2 Cache and L3 Shared Intel® Smart Cache	Up to 112.5 MB for increased performance and data management by reducing time spent swapping data between cache and memory.
Intel® Deep Learning Boost[3]	Accelerates training and inferencing of AI models, enabling developers' end-to-end workflow.
Support for select Intel vPro® Enterprise Technology[1]	Give IT professionals the tools for easy system integration and management of workstation platforms into existing enterprise networks.
ECC Memory Support	Error-Correcting Code memory detects and corrects errors and improves the integrity of essential data without workflow interruption.
Intel® Turbo Boost Technology 3.0	Identifies the processor's fastest cores and directs critical workloads to them.
Intel® Turbo Boost Technology 2.0	Intelligently boosts the processor to run faster than its rated frequency as power, heat, and workload allow.

Intel® W790 Chipset Features at a Glance

Support for Intel® Xeon® W-3500 & Intel® Xeon® W-2500 Processors

Feature	Benefit
High Speed I/O Lanes	Up to 38 lanes for configuration flexibility and accelerated performance.
PCIe Express 3.0 Interface	Offers up to 8 GT/s for fast access to peripheral devices and networking with up to 12 PCI Express 3.0 lanes, configurable as x1, x2, and x4 depending on motherboard designs.
PCIe Express 4.0 Interface	Offers up to 16 GT/s for fast access to peripheral devices and networking with up to 16 PCI Express 4.0 lanes, configurable as x1, x2, and x4 depending on motherboard designs.
DMI	Supports faster data transfer with increased lanes of up to 8 Direct Media Interface Gen 4.0.
USB 3.2 Gen 2x2	Integrated USB 3.2 Gen 2x2 support provides data transfer performance with a design data rate of up to 20 Gb/s.
USB 3.2 Gen 2x1	Integrated USB 3.2 Gen 2x1 support provides data transfer performance with a design data rate of up to 10 Gb/s.
USB 3.2 Gen 1x1	Integrated USB 3.2 Gen 1x1 support provides data transfer performance with a design data rate of up to 5 Gb/s.
USB 2.0	High-Speed USB 2.0 support with a design data rate of up to 480 Mb/s.
Serial ATA (SATA) 6 Gb/s	High-speed storage interface supporting up to 6 Gb/s transfer rates for optimal data access.
Intel® Wi-Fi 6E Support	Integrated Intel® Wi-Fi 6E AX211(Gig+) CNVi solution or Intel® Wi-Fi 6E AX210(Gig+) solution allowing you to connect up to Gigabit Wi-Fi speeds.
Modern Manageability with Intel® Active Management Technology (Intel® AMT)	Remote out-of-band management for efficient proactive and reactive system maintenance over Ethernet or Wi-Fi connections.
Intel® Boot Guard	Supports cryptographically verified boot as recommended by Windows best security practices.
Intel® Platform Trust Technology	Integrated Trusted Platform Module within Intel® chipsets, supporting TPM 2.0 standard.

Intel vPro® Enterprise Technology Supported at a Glance

Feature	Benefit
Intel® Firmware Version Control (FVC)	Prevents reinstallation of older firmware.
Intel® VT-rp (redirect protection) (Formerly HLAT)	Hardware-enhanced protection for OS virtualization.
Intel® Virtualization Technology (Intel® VT-x / VT-d)	Accelerates hypervisor and virtual machine switching for OS security services.
Intel® Platform Trust Technology	Integrated Trusted Platform Module within Intel SOCs, supporting TPM 2.0 and Intel® TXT.
Intel® Trusted Execution Technology (Intel® TXT)	Provides dynamic root of trust for Windows or other system software.
Intel® Control Flow Enforcement Technology (Intel® CET)	Integrated USB 3.2 Gen 2x1 support provides data transfer performance with a design data rate of up to 10 Gb/s.
Intel® Transparent Supply Chain (Intel® TSC)	The mechanism for confirming system component and firmware authenticity via digital certificate, an As-Built report, and an Auto Verify Tool.
Intel® Boot Guard	Supports cryptographically verified boot as recommended by Windows best security practices.
Intel® BIOS Guard	Helps protect firmware residing in non-volatile memory.
Intel's Advanced Programmable Interrupt Controller with Virtualization (APIC-v)	Provides hardware support for task switching including hypervisors and Virtualization-Based Security (VBS) in Windows 10.
Intel® Active Management Technology (Intel® AMT)	Remote out-of-band management for efficient proactive and reactive system maintenance over Ethernet or Wi-Fi connections.
Intel® Endpoint Management Assistant (Intel® EMA)	Provides the ability to remotely and securely manage Intel® Active Management Technology (Intel® AMT) devices beyond the firewall.
Intel® Unique Platform ID (Intel® UPID)	Creates unique and persistent ownership credentials for Intel vPro® platform devices to facilitate the deployment of services.

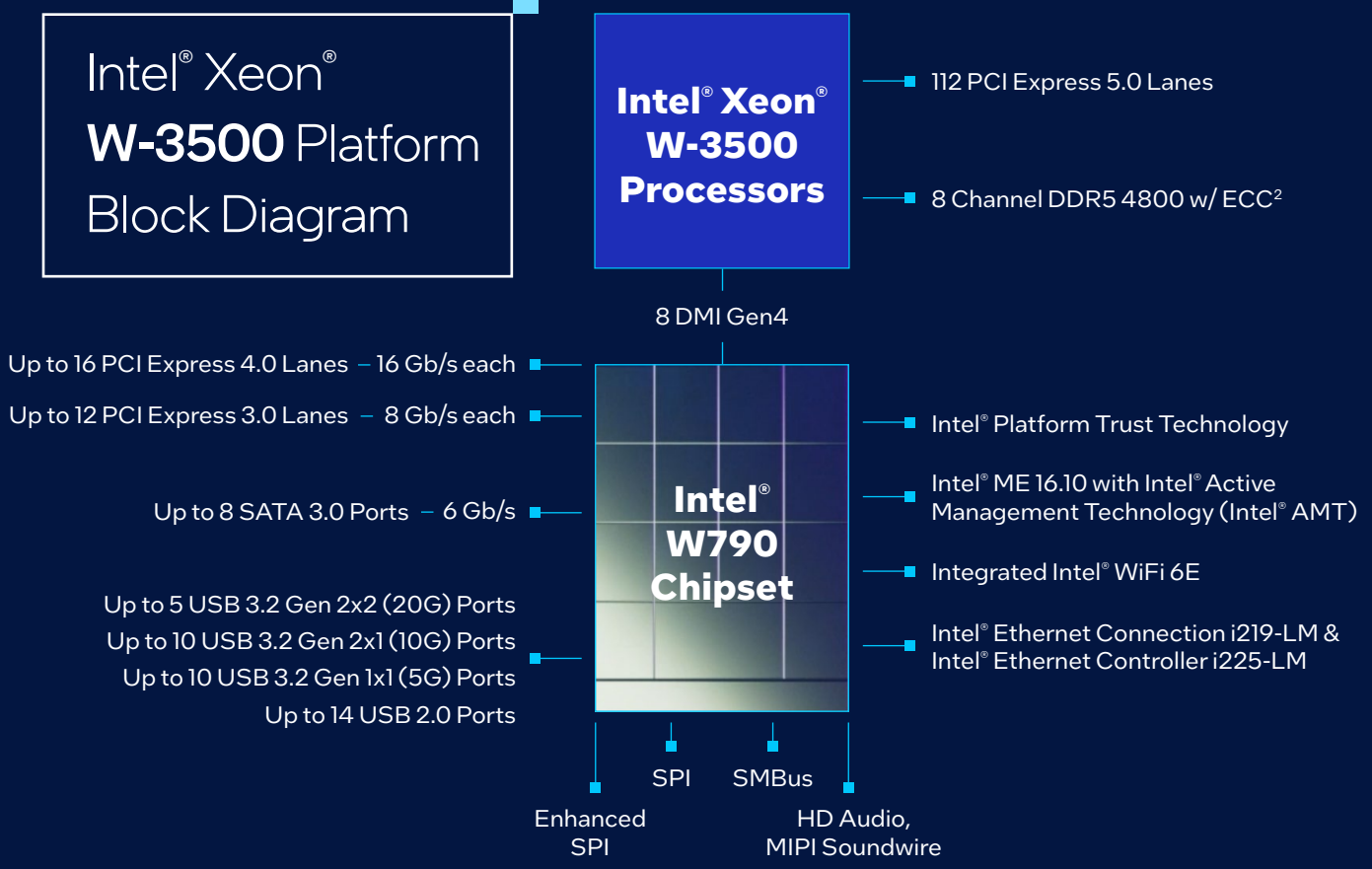
Intel® Xeon® **W-3500** Processors Comparison

	Intel® Xeon® w9 Processors	Intel® Xeon® w7 Processors	Intel® Xeon® w5 Processors
Processor Cores	Up to 60 (60P + 0E)	Up to 32 (32P + 0E)	Up to 20 (20P + 0E)
Intel® Hyper-Threading Technology	Yes		
Total Processor Threads	Up to 120	Up to 64	Up to 40
Intel® Smart Cache (L3)	Up to 112.5 MB	Up to 82.5 MB	Up to 52.5 MB
Intel® Turbo Boost Max Technology 3.0 Frequency	Up to 4.8 GHz		
Processor Base Frequency	Up to 2.2 GHz	Up to 2.7 GHz	Up to 3.2 GHz
CPU PCIe 5.0 Lanes	112		
Maximum Memory Speed[2]	DDR5 4800 MT/s		
Memory Channels	8		
Maximum Memory Capacity[2]	4 TB		
Maximum Turbo Power	Up to 462 W	Up to 402 W	Up to 360 W
Processor Base Power	Up to 385 W	Up to 335 W	Up to 300 W
Reliability, Availability, Serviceability	ECC, Standard RAS		
Intel vPro® Enterprise Technology[4]	Yes		
Intel® Boot Guard	Yes		
Intel® Platform Trust Technology	Yes		
Intel® Deep Learning Boost	Yes		
Intel® Data Streaming Accelerator (Intel® DSA)	Yes		
Intel® Advanced Matrix Extensions (Intel® AMX)	Yes		
Intel® Advanced Vector Extensions 2 (Intel® AVX2)	Yes		
Intel® Advanced Vector Extensions 512 (Intel® AVX-512)	Yes		
Intel® Advanced Vector Extensions 512 (Intel® AVX-512) FMA Units	2		

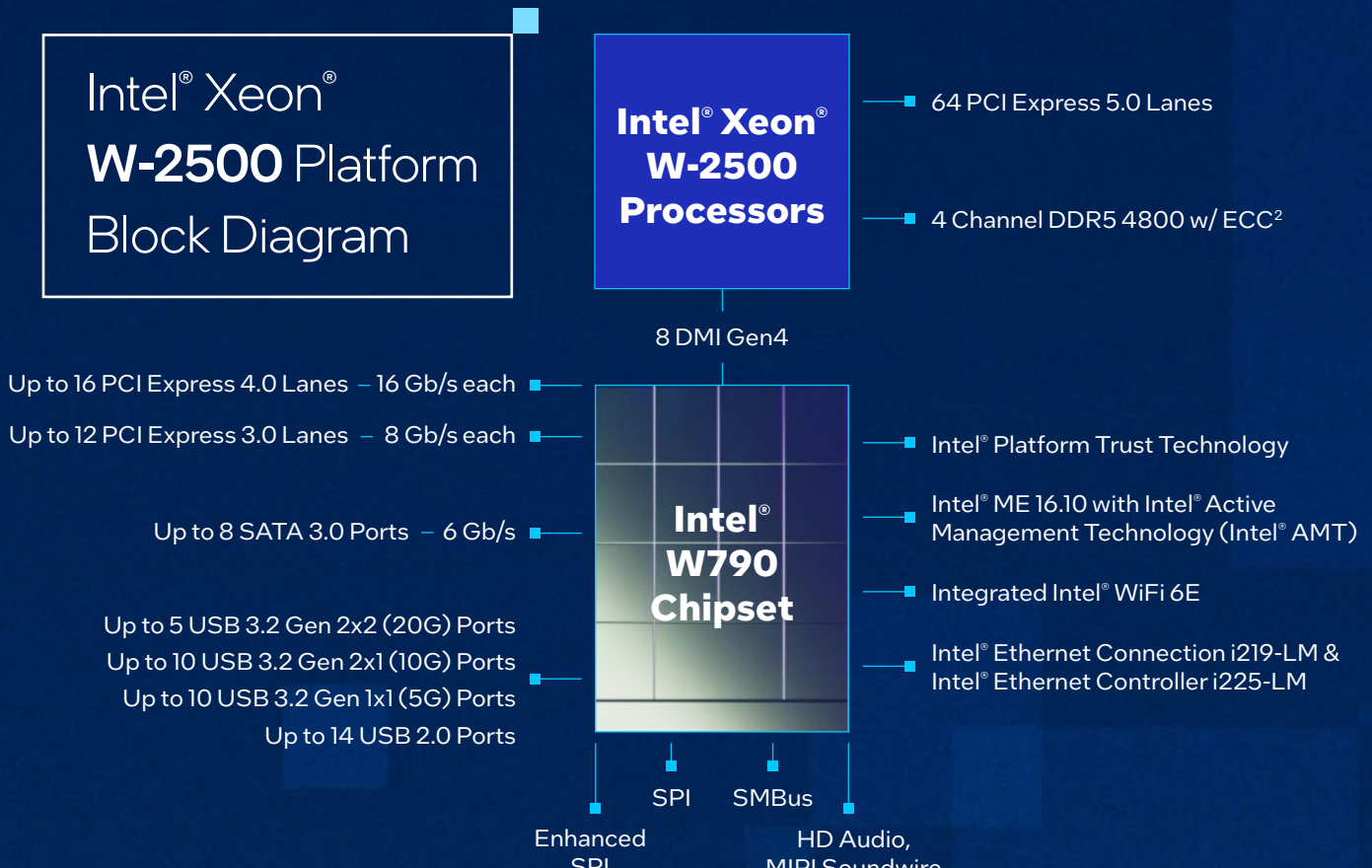
Intel® Xeon® **W-2500** Processors Comparison

	Intel® Xeon® w7 Processors	Intel® Xeon® w5 Processors	Intel® Xeon® w3 Processors
Processor Cores	Up to 26 (26P + 0E)	Up to 18 (18P + 0E)	Up to 10 (10P + 0E)
Intel® Hyper-Threading Technology	Yes		
Total Processor Threads	Up to 52	Up to 36	Up to 20
Intel® Smart Cache (L3)	Up to 48.75 MB	Up to 37.5 MB	Up to 26.25 MB
Intel® Turbo Boost Max Technology 3.0 Frequency	Up to 4.8 GHz		Up to 4.6 GHz
Processor Base Frequency	Up to 3.0 GHz	Up to 3.5 GHz	
CPU PCIe 5.0 Lanes	64		
Maximum Memory Speed[2,5]	DDR5 4800 MT/s		DDR5 4400 MT/s
Memory Channels	4		
Maximum Memory Capacity[2]	2 TB		
Maximum Turbo Power	Up to 300 W	Up to 288 W	Up to 222 W
Processor Base Power	Up to 250 W	Up to 240 W	Up to 185 W
Reliability, Availability, Serviceability	ECC, Standard RAS		
Intel vPro® Enterprise Technology[4]	Yes		
Intel® Boot Guard	Yes		
Intel® Platform Trust Technology	Yes		
Intel® Deep Learning Boost	Yes		
Intel® Data Streaming Accelerator (Intel® DSA)	Yes		
Intel® Advanced Matrix Extensions (Intel® AMX)	Yes		
Intel® Advanced Vector Extensions 2 (Intel® AVX2)	Yes		
Intel® Advanced Vector Extensions 512 (Intel® AVX-512)	Yes		
Intel® Advanced Vector Extensions 512 (Intel® AVX-512) FMA Units	2		

Intel® Xeon® **W-3500** Platform Block Diagram



Intel® Xeon® **W-2500** Platform Block Diagram



Notices & Disclaimers

All versions of the Intel vPro® platform require an eligible Intel processor, a supported operating system, Intel® LAN and/or WLAN silicon, firmware enhancements, and other hardware and software necessary to deliver the manageability use cases, security features, system performance, and stability that define the platform. See https://www.intel.com/performance-vpro/ for details.

6 GHz Wi-Fi 6E operation requires the use of Intel® Wi-Fi 6E (Gig+) products in conjunction with operating systems and routers/APs/ Gateways that support Wi-Fi 6E, together with regional spectrum allocation and required regulatory certifications. Visit https://www.intel.com/performance-wireless/ for details.

1. For a full list of Intel vPro® platform technologies by product line, visit https://www.intel.com/content/www/us/en/products/details/processors/vpro.html
2. Maximum memory speeds are associated with 1 DIMM per Channel (1DPC) configurations. Additional DIMM loading on any channel may impact maximum memory speed. Maximum memory capacity is achievable with 2DPC configurations.
3. Intel® Deep Learning boost consists of AVX-512, TMUL, and Bfloat16 instruction sets.
4. Intel vPro® Enterprise with Intel® Active Management Technology (Intel® AMT) or Intel® Standard Manageability (Intel® ISM), when paired with a motherboard with supporting hardware and software, and potential service activation.
5. DDR5 4400 MT/s memory speed supported with 1DPC and 2DPC configurations.

Performance varies by use, configuration, and other factors. Learn more at www.Intel.com/PerformanceIndex.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Your costs and results may vary.

Intel technologies may require enabled hardware, software, or service activation.

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