

The New Intel® Core™ X-series Processor Family - Featuring the Intel® Core™ i9 Extreme Edition Processor

Extreme Platform for Gaming and Content Creation

Aug. 7, 2017 — Creating rich, immersive experiences and bringing them to life takes a lot of compute power. Creators, gamers and enthusiasts have an insatiable demand for more power, more performance and more capability that lets them focus on what they want to do, not on whether their computer is up to the task. Intel is committed to continue giving them that extreme platform.

Introducing the new Intel® Core™ X-series processor family: Intel's most scalable, accessible and powerful desktop platform ever. Ranging from 4 to 18 cores, it offers unprecedented scalability. With price points to match, there is an Intel Core X-series processor that is sure to meet the needs for the widest range of enthusiast customers ever.



We're also introducing the entirely new Intel Core i9 processor brand, representing Intel's highest performance for advanced gaming, VR and content creation. At the top of the lineup is the new Intel Core i9 Extreme Edition processor – the first consumer desktop CPU with 18 cores and 36 threads of power.

Select SKUs of the Intel Core X-series processor family brings extreme performance to enthusiasts with Intel® Turbo Boost Max Technology 3.0 creating new levels of single-threaded and dual-threaded performance. The Intel Core X-series processor family also delivers the first teraflop desktop CPU from Intel. And install Intel® Optane™ memory, a smart system accelerator to improve system responsiveness with large storage drives. Intel Core X-series processors use more cores and more threads to do more simultaneous workloads, like extreme mega-tasking (game + stream + record + encode). For our enthusiasts, we have new overclocking features including Intel® Advanced Vector Extensions 512 ratio offset, memory controller trim voltage control, and PEG/DMI overclocking to get more performance.

Extreme Performance for Single-Thread and Multithread Computing

- Up to 15 percent faster multithread performance¹ over previous generation
- Up to 15 percent faster single-thread performance² over previous generation
- Massive 36-thread performance and quad-channel memory for content creation and extreme mega-tasking
- Up to 68 lanes of PCIe 3.0 on the platform to expand your system with fast SSDs, multiple discrete graphics cards and ultrafast Thunderbolt™ 3 technology

Key Features:

- New! Intel Core i9 Extreme Edition processor featuring 18 cores and 36 threads
- New! Intel's most scalable high-end desktop platform ever with 18, 16, 14, 12, 10, 8, 6, and 4-core options
- New! Intel X299 chipset with improved I/O capabilities
- New! LGA 2066 socket for Intel Core X-series processor family

- New! Additional system performance and amazing responsiveness with Intel® Optane™ memory support
- Improved Intel® Turbo Boost Max Technology 3.0 (select SKUs) for up to 2-core/4-thread workloads
- Up to 44 lanes of PCIe 3.0 directly connected to the CPU, with up to 24 connected to the PCH
- Up to 4 channel DDR4-2666 memory support, support for the Intel® Extreme Memory Profile (Intel® XMP) specification, revision 2.0 for DDR4
- Fully unlocked for performance tuning
- Rebalanced smart cache hierarchy
- Intel® Hyper-Threading Technology

Availability

- Systems and boxed processors are available at launch via online retail and through channel partners in all geographies.

Family Lineup

- Scalability with 18, 16, 14, 12, 10, 8, 6, and 4 cores.

Core i9 Processors

Processor Name	Intel® Core™ i9-7980XE X-series processor	Intel® Core™ i9-7960X X-series processor	Intel® Core™ i9-7940X X-series processor	Intel® Core™ i9-7920X X-series processor	Intel® Core™ i9-7900X X-series processor
Cores/ Threads	18/36	16/32	14/28	12/24	10/20
Base Clock Speed (GHz)	2.6	2.8	3.1	2.9	3.3
Intel® Turbo Boost Max Technology 3.0	Enabled	Enabled	Enabled	Enabled	Enabled
Intel® Turbo Boost Max Technology 3.0 Frequency (GHz)	Up to 4.4	Up to 4.4	Up to 4.4	Up to 4.4	Up to 4.5
L3 Cache	24.75MB	22MB	19.25MB	16.5MB	13.75MB
Memory Support	4 channels DDR4-2666	4 channels DDR4-2666	4 channels DDR4-2666	4 channels DDR4-2666	4 channels DDR4-2666
PCIe Lanes off CPU	44	44	44	44	44
TDP	165W	165W	165W	140W	140W
Socket (LGA)	2066	2066	2066	2066	2066
1KU Pricing	\$1,999	\$1,699	\$1,399	\$1,199	\$999

Core i7 & i5 Processors

Processor Name	Intel® Core™ i7-7820X X-series processor	Intel® Core™ i7-7800X X-series processor	Intel® Core™ i7-7740X X-series processor	Intel® Core™ i5-7640X X-series processor
Cores/ Threads	8/16	6/12	4/8	4/4
Base Clock Speed (GHz)	3.6	3.5	4.3	4
Intel® Turbo Boost Max Technology 3.0	Enabled	Enabled	Enabled	Enabled
Intel® Turbo Boost Max Technology 3.0 Frequency (GHz)	Up to 4.5	N/A	N/A	N/A
L3 Cache	11MB	8.25MB	8MB	6MB
Memory Support	4 channels DDR4-2666	4 channels DDR4-2400	2 channels DDR4-2666	2 channels DDR4-2666
PCIe Lanes off CPU	28	28	16	16
TDP	140W	140W	112W	112W
Socket (LGA)	2066	2066	2066	2066
1KU Pricing	\$599	\$389	\$339	\$242

Intel® X299 Chipset: Unprecedented System Performance and Scalability

Intel is also introducing the new Intel® X299 chipset with improved I/O capabilities, providing the ultimate in flexibility – supporting 30 total high-speed I/O lanes, up to three Intel® Rapid Storage Technology PCIe 3.0 x4 storage support, and support for Intel® Ethernet Connection I219 (Jacksonville LAN PHY). The Intel X299 chipset also provides the ultimate in scalability with the new LGA 2066 socket – compatible with all new Intel Core X-series processors (4C–18C). For increased system responsiveness, the Intel X299 chipset is Intel Optane memory ready and provides faster throughput times with DMI 3.0.

For more information, visit us at Intel.com

- Intel® Core™ X-series Processor Family: www.intel.com/content/www/us/en/products/processors/core/x-series.html?cache=true
- Intel® X299 Chipset: www.intel.com/content/www/us/en/products/chipsets/desktop-chipsets/x299.html
- Intel® Turbo Boost Max Technology 3.0: www.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-max-technology.html
- Intel® Optane™ Memory: www.intel.com/optanememory

Intel® X299 Chipset Specifications:

Chipset Name	Intel® X299 Chipset
Chipset PCI Express 3.0 Lanes	Up to 24
SATA 3.0 (6 Gb/s) Ports	Up to 8
USB 3.0 Ports	Up to 10
Total USB Ports (USB 2.0 + 3.0)	14
Intel® RST for PCIe 3.0 Storage Ports (up to x4 M.2)	3
Enhanced SPI	✓
Processor PCI Express 3.0 Lanes Configuration Support	N/A – CPU PCIe not PCH dependent
DMI Speed	3.0
Intel® Management Engine 11.6	Consumer
Intel® Platform Trust Technology 3.0	✓
Overclocking	✓
Independent Display Support	3
System Memory Support	DDR4
System Memory Channels/SPC	Up to 4/2

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

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/.

Testing Information:

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. For more complete information about performance and benchmark results, visit <http://www.intel.com/benchmarks>.

Benchmark Information

Compute Intensive Application Performance. SPEC* CPU2000/2006 is a benchmark from the SPEC consortium that measures device performance and throughput using compute intensive application subtests. SPECint*_base2000/2006 measures how fast a device completes a single integer compute task. SPECint*_rate_base2000/2006 measures throughput, or how many integer compute tasks a device can accomplish in a given amount of time. OS support: Desktop Windows*, UNIX*/Linux* and Mac* OS.

Configurations

Intel® Core™ i7-6950X Processor (3.0GHz up to 3.5GHz, 10C/20T, 25MB, 140W TDP) measured on - Motherboard: ASRock X99M Extreme4, Memory: 4x8GB DDR4-2400, Storage: Intel 750 PCIe SSD -400GB, OS: Windows* 10 (RS2) , Graphics: Nvidia GTX 1080Ti (Driver 22.21.13.8205), BIOS:BIOS P3.20 , Intel® Turbo Boost Max Driver Version 1.0.0.1029, System Power Management Policy: Balanced

Intel Core™ i9-7900X Processor (3.3GHz up to 4.5GHz, 10C/20T, 13.75MB, 140W TDP) measured on – Motherboard: Gigabyte X299, Memory: 4x8GB DDR4-2666, Storage: Intel 750 PCIe SSD- 400GB, OS: Windows* 10 (RS2), Graphics: Nvidia GTX 1080Ti (Driver 22.21.13.8233), BIOS:BIOS F5H , Intel® Turbo Boost Max Driver Version 1.0.0.1029, System Power Management Policy: High Performance

1 Based on SPEC*int_rate_base2006 (n copy) comparing Intel® Core™ i9-7900X X-series processor (10C20T) vs. Intel® Core™ i7-6950X Processor (10C/20T).

2 Based on SPEC*int_rate_base2006 (1 copy) comparing Intel® Core™ i9-7900X X-series processor (10C20T) vs. Intel® Core™ i7-6950X Processor (10C/20T)

Note: Performance estimates are preliminary based on pre-silicon projections and are subject to +/- 5% error.

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