NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

May 2017

MARKET GROWTH

UP TO **20%**

YEAR OVER YEAR*

*2015 to 2016 year-over-year change based on Intel® desktop unlocked processor revenue units

INTRODUCING INTEL'S®

MOST POWERFUL, MOST SCALABLE

DESKTOP PROCESSOR

NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

The new Intel® Core™ X-series processor family is the ultimate desktop platform, delivering extreme mega-tasking power for today's demanding enthusiasts and creatives.

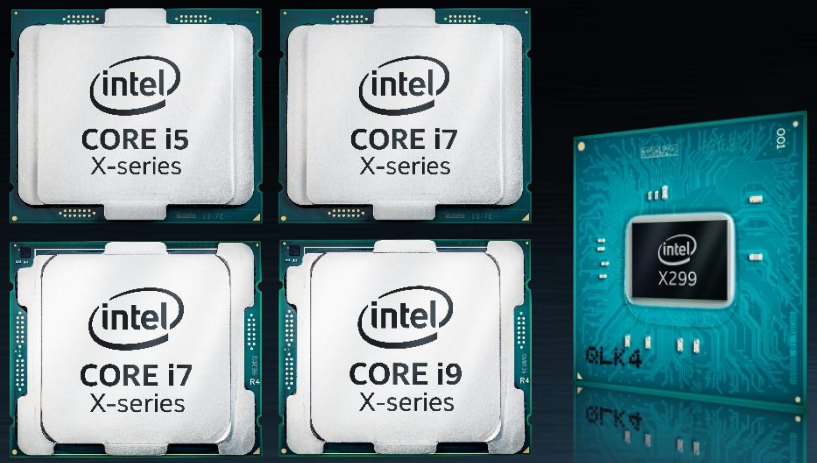
EXTREME PERFORMANCE

EXTREME MEGA-TASKING

THE ULTIMATE PLATFORM

NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

(Codename: Basin Falls)



NEW and improved Intel® Core™ X-series processors for extreme enthusiasts

- Introducing the first Intel® Core™ Extreme Edition processor with 18 cores
- Most scalable high-end desktop platform ever with options for 18, 16, 14, 12, 10, 8, 6, and 4 cores
- Updated Intel® Turbo Boost Max Technology 3.0
- Rebalanced smart cache hierarchy
- Intel Core® X-series™ processor on new LGA 2066 socket
- Intel® X299 chipset with improved I/O capabilities

EXTREME performance for single-thread and multithread computing

- Up to 10 percent faster multithread performance[1] than previous generation
- Up to 15 percent faster single-thread performance[2] than previous generation
- Massive 36-thread performance and quad-channel memory for content creation and extreme megatasking

ULTIMATE platform for gaming, VR, content creation and overclocking

- Up to 44 lanes of PCIe 3.0 directly connected to the CPU, so systems can be expanded with fast SSDs, multiple discrete graphics cards, and ultrafast Thunderbolt™ 3 technology
- Additional system performance and amazing responsiveness with Intel® Optane™ memory and Intel® Optane™ SSDs
- Fully unlocked processors deliver tuning flexibility for additional performance headroom

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 +/- 7% error
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 visit http://www.intel.com/benchmarks.

NEW INTEL® CORE™ I9 EXTREME EDITION PROCESSOR

Intel's first 18-core desktop processor

Intel's highest-performance processor for advanced gaming, VR and content creation

- New! 18 cores, 36 threads
- New! Teraflop CPU
- New! Support for Intel® AVX-512
- Improved Intel® Turbo Boost Max Technology 3.0
- Support for LGA 2066 socket
- 44 PCIe* 3.0 lanes
- Four-channel DDR4-2666 memory support
- Fully unlocked for performance tuning
- Rebalanced Intel® Smart Cache hierarchy
- Intel® Optane™ memory
- Intel® Hyper-Threading Technology (Intel® HT Technology)

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

IMPROVED INTEL® TURBO BOOST MAX TECHNOLOGY 3.0

Updated Intel® Turbo Boost Max Technology 3.0 improves single- and dual-core performance in the new Intel® Core™ X-series processors[1]

1. Only available on SKUs **7820X, 7900X, 7920X, 7940X, 7960X, 7980XE**

NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

Intel's most powerful desktop processors for a new world of gaming and creation

CREATIVITY WITHOUT COMPROMISE

UNRIVALED PC GAMING EXPERIENCES

FREEDOM TO PUSH THE LIMIT

THE ULTIMATE PLATFORM FOR CONTENT CREATION

New Intel® Core™ X-series processor family

EXTREME MEGA-TASKING

- Spend more time creating and less time waiting
- Edit, animate, render, transcode and more – simultaneously

UNLEASH YOUR CREATIVITY

- The ideal platform for editing and rendering high-resolution 4K and VR video and effects
- Fast video transcode, image stabilization, 3D effects rendering and animation

A FULL STUDIO IN YOUR PC

- Create and design on a bank of 4K monitors
- Enjoy multiple options for capture and input
- Output options include 3D and large-format printers

MONSTER PLATFORM FOR PC GAMING

BOOST PERFORMANCE

- Intel's best 4K gaming performance
- Support for two, three or four graphics cards
- Amazing single-threaded game play with the updated **Intel® Turbo Boost Max Technology 3.0**

EXTREME MEGA-TASKING

- Game, stream, record and encode simultaneously
- Play your favorite game in 4K while broadcasting HD live streams around the world on **Twitch* and YouTube***
- Record with the highest quality 4K encode and post highlights in stunning 4K resolution

IMMERSE YOURSELF

- Surround yourself with a cockpit of monitors, with support for up to four discrete GFX cards
- Power up to experience highly demanding virtual reality games

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

*Other names and brands may be claimed as the property of others

OVERCLOCKING

New Intel® Core™ X-series processor family

UNLEASH THE BEAST

New overclocking features:

- Intel® Advanced Vector Extension-512 (AVX-512) ratio offset
- Memory controller trim voltage control
- PEG/DMI overclocking

Continued support for:

- Per-core overclocking
- Per-core voltage
- Enhanced memory overclocking

EXTREME TUNING

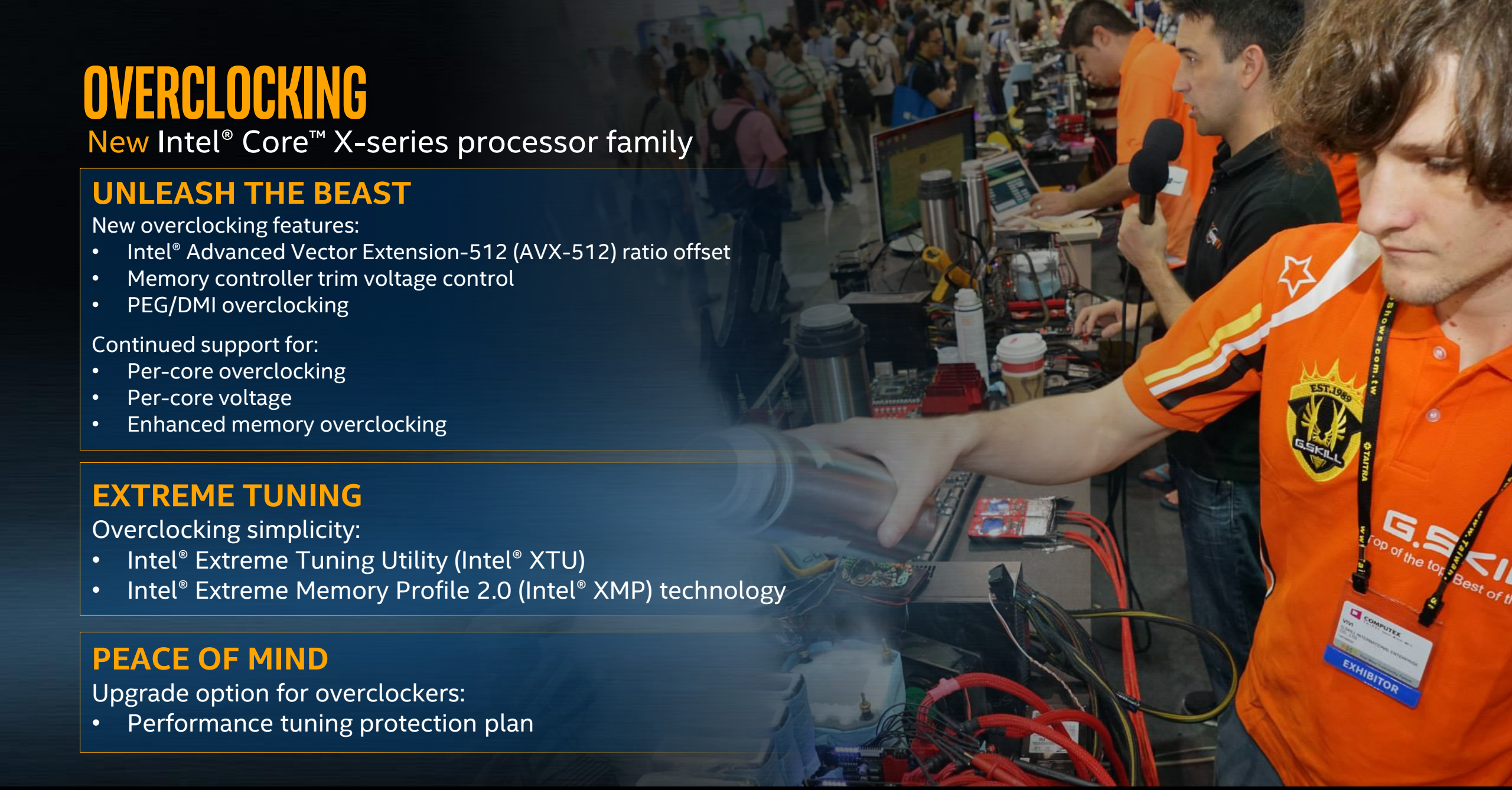
Overclocking simplicity:

- Intel® Extreme Tuning Utility (Intel® XTU)
- Intel® Extreme Memory Profile 2.0 (Intel® XMP) technology

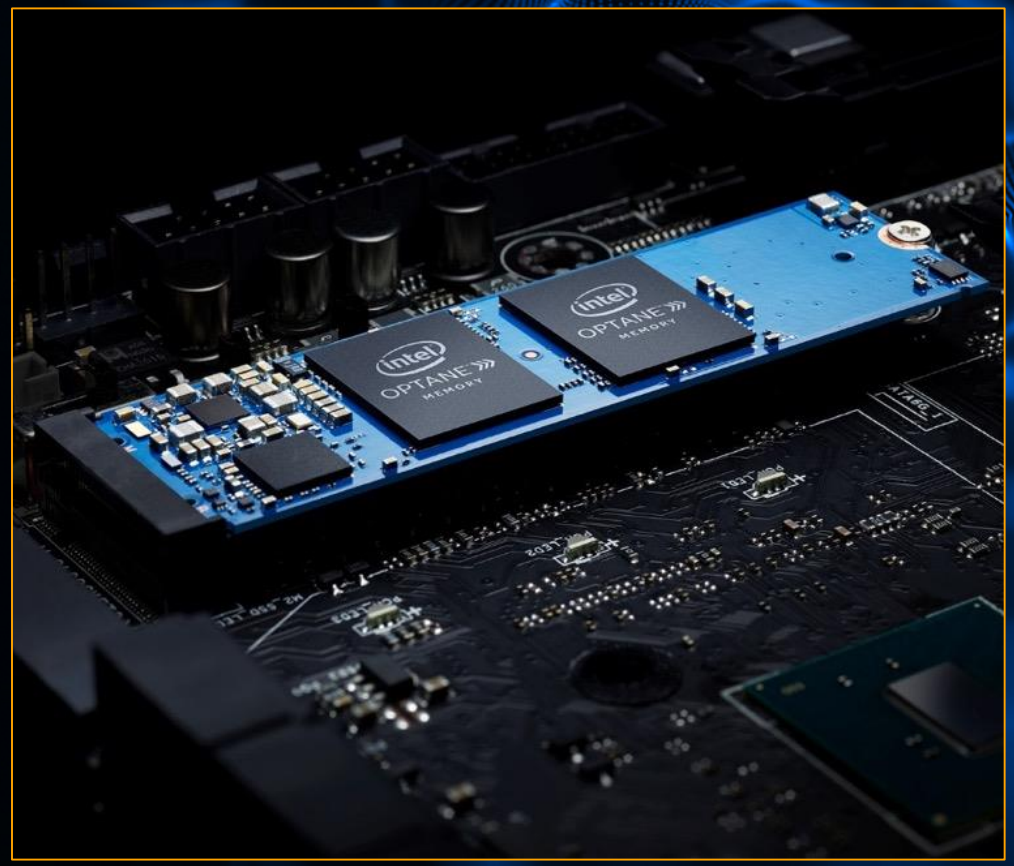
PEACE OF MIND

Upgrade option for overclockers:

- Performance tuning protection plan



INTEL® TECHNOLOGIES WORK TOGETHER FOR OPTIMAL PERFORMANCE



THUNDERBOLT™

PCI EXPRESS®

SUPERSPEED USB

DisplayPort

More **protocols**

More **speed**

40 Gbps – fastest connection[1]

More **pixels**

Dual 4K displays
60 Hz

More **power**

100W charging

15W device

Other names and brands may be claimed as the property of others

1 As compared to any other connection to the PC

INTEL® LIQUID COOLING TS13X

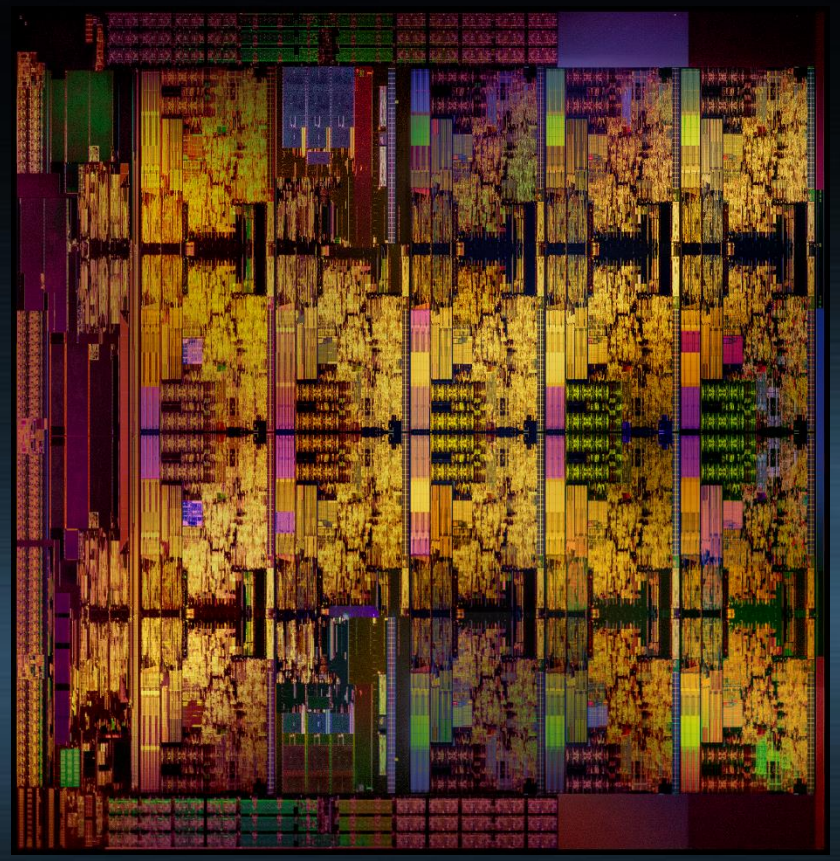
HIGH-PERFORMANCE THERMAL SOLUTION FOR ENTHUSIASTS

Separate boxed SKU available from distribution and at retail

Fan speed	800–2,200 RPM (four-wire PWM)
Fan dimensions	120 mm x 120 mm x 25 mm
Fan CFM	73.84 CFM
Unit noise level	21 dBA @ 800 RPM 35 dBA @ 2,200 RPM
Radiator dimensions	150 mm x 118 mm x 37 mm
Pump Z height	31 mm
Total thermal solution weight	820 grams
Cooling liquid	Propylene glycol
Thermal interface material	Dow Corning* TC-1996

Compatible with socket 2011/1366/115X
Estimated retail pricing $85–$100

NEW DIE MAP FOR INTEL® CORE™ X-SERIES PLATFORM



INTEL® CORE™ I9-7980XE
PROCESSOR DIE MAP

14 nm tri-gate 3D transistors

NEW INTEL® CORE™ X-SERIES PROCESSOR

More core options:
18, 16, 14, 12, 10, 8, 6, and 4

Rebalanced Intel® Smart Cache hierarchy[1]

Intel®
Turbo Boost Technology

Intel® Hyper-Threading Technology
(Intel® HT Technology)

Skylake-X and Kaby Lake-X processors

Intel® X299 Chipset

Update: Intel® Turbo Boost Max Technology 3.0[2]

Support for overclocking with extreme edition and "X" SKUs

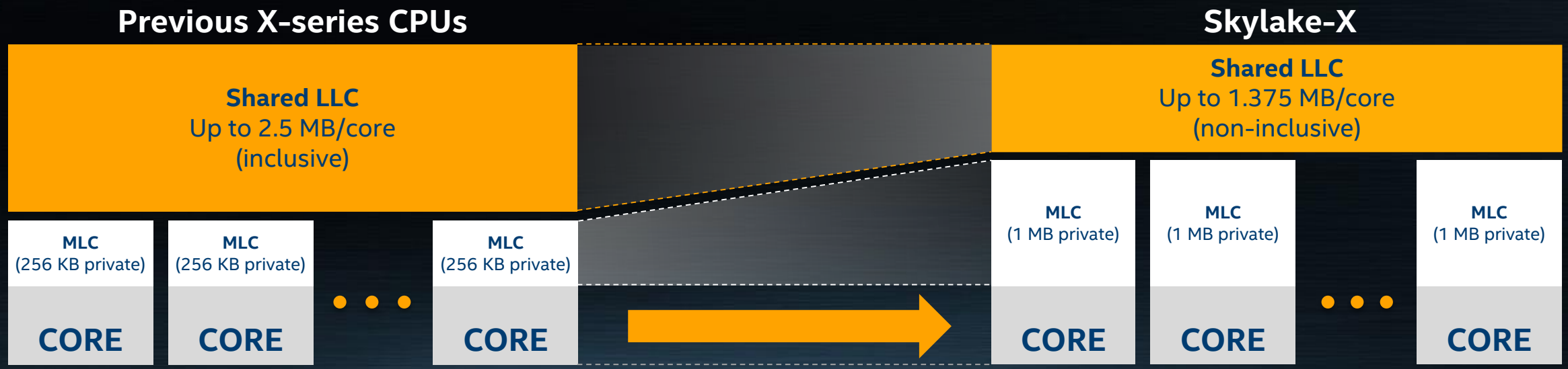
Integrated memory controller:
Up to four channels DDR4 2666[2]

Up to 44 lanes PCIe* 3.0

Power = 140W[3]
Socket: LGA 2066

See product specifications for features supported on the SKUs
1. Rebalanced cache hierarchy. See next slide for details
2. Only available on SKUs **7820X, 7900X, 7920X, 7940X, 7960X, 7980XE**
3. On SKUs 7800X, 7820X and 7900X. 7640X and 7740X SKUs have 112W TDP

REBALANCING THE CACHE HIERARCHY[1]



- Shift cache balance from shared-distributed to private-local by enlarging MLC
- Shared LLC retained to benefit shared data and to enable capacity balancing

High hit rate on low-latency MLC increases performance

LLC= Last-level cache; MLC = Midlevel cache

1. Not available with SKUs 7640X and 7740X

INTEL® X299 CHIPSET

Redefines the enthusiast desktop experience

INCREASED SYSTEM RESPONSIVENESS

Intel® Optane™ memory ready[1]

Faster throughput times with DMI 3.0[2]

IMPROVED I/O CAPABILITIES

30 total high-speed I/O lanes with increased port flexibility:

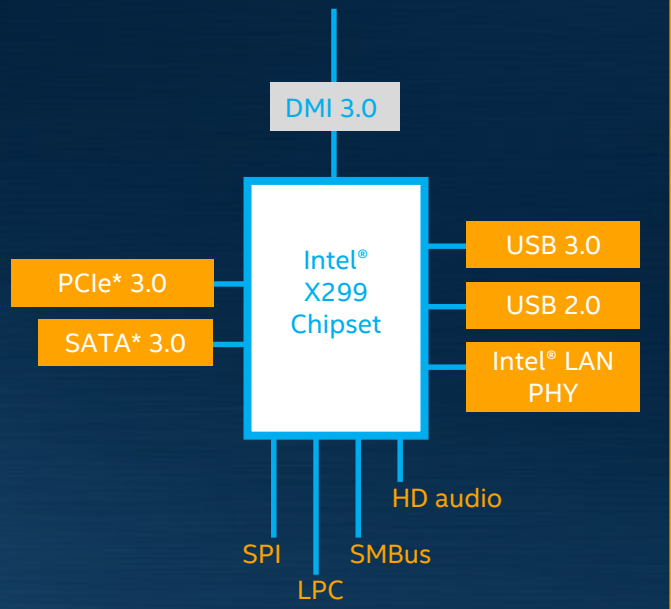
- Up to 24 PCIe* 3.0 lanes
- Up to eight SATA* 3.0 ports
- Up to 10 USB 3.0 ports

Up to three Intel® Rapid Storage Technology PCIe 3.0 x4 storage support

Supports Intel® Ethernet Connection I219 (Jacksonville LAN PHY)

ULTIMATE SCALABILITY

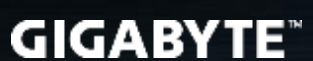
New Socket R4 (LGA 2066)—compatible with all new Intel® Core™ X-series processors (4C–18C)



1. Compared to HDD alone.
2. Compared to Intel® X99 Chipset.

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 information go to http://www.intel.com/performance.

INTEL® CORE™ X-SERIES PROCESSOR PARTNERS



Not a comprehensive list of customers and partners

UNLOCKED INTEL® CORE™ X-SERIES PROCESSOR FAMILY

	Processor number[1]	Base clock speed (GHz)	Intel® Turbo Boost Technology 2.0 frequency[2] (GHz)	Intel® Turbo Boost Max Technology 3.0 frequency[3] (GHz)	Cores/ threads	L3 cache	PCI Express* 3.0 lanes	Memory support	TDP	Socket (LGA)	RCP pricing (USD 1K)
NEW	**Intel® Core™ i9-7980XE**	-	-	-	18/36	-	-	-	-	2066	$1,999
NEW	**Intel® Core™ i9-7960X**	-	-	-	16/32	-	-	-	-	2066	$1,699
NEW	**Intel® Core™ i9-7940X**	-	-	-	14/28	-	-	-	-	2066	$1,399
NEW	**Intel® Core™ i9-7920X**	-	-	-	12/24	-	-	-	-	2066	$1,199
NEW	**Intel® Core™ i9-7900X**	3.3	4.3	4.5	10/20	13.75 MB	44	Four channels DDR4-2666	140W	2066	$999
NEW	**Intel® Core™ i7-7820X**	3.6	4.3	4.5	8/16	11 MB	28	Four channels DDR4-2666	140W	2066	$599
NEW	**Intel® Core™ i7-7800X**	3.5	4.0	NA	6/12	8.25 MB	28	Four channels DDR4-2400	140W	2066	$389
NEW	**Intel® Core™ i7-7740X**	4.3	4.5	NA	4/8	8 MB	16	Two channels DDR4-2666	112W	2066	$339
NEW	**Intel® Core™ i5-7640X**	4.0	4.2	NA	4/4	6 MB	16	Two channels DDR4-2666	112W	2066	$242

1. Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See intel.com/products/processor_number for details.
2. Refers to the maximum dual-core frequency that can be achieved with Intel® Turbo Boost Technology 2.0.
3. Refers to the maximum dual-core frequency that can be achieved with Intel® Turbo Boost Max Technology 3.0.

INTEL® CORE™ X-SERIES GENERATIONAL PLATFORM COMPARISON

Brand	New Intel® Core™ X-series processor/ Intel® X299 chipset		Intel® Core™ X-series processor/ Intel® X99 chipset	Intel® Core™ X-series processor/ Intel® X99 chipset
Processor family (year)	**SKL-X 2017**	**KBL-X 2017**	**BDW-E 2016**	**HSW-E 2014**
CPU cores	18, 16, 14, 12, 10, 8, and 6	4	10, 8, and 6	8 and 6
Intel® Turbo Boost Max technology 3.0	Yes[1]	No	Yes	No
Shared cache	Up to 16.5 MB[2]	Up to 8 MB	Up to 25 MB	Up to 20 MB
PCIe lanes off of processor	Up to 44 (7800X & 7820X have 28)[3]	16	Up to 40 (6800K has 28)[3]	Up to 40 (6800K has 28)[3]
Discrete GFX configurations	2x16/4x8[4] of gen. 3 on processor	1x16/2x8 of gen. 3 on processor	2x16/4x8[4] of gen. 3 on processor	2x16/4x8[4] of gen. 3 on processor
Memory	Four-channel DDR4 2666[1]	Two-channel DDR4 2666	Four-channel DDR4 2400	Four-channel DDR4 2133
TDP	140W	112W	140W	140W
Socket	LGA 2066	LGA 2066	LGA 2011-v3	LGA 2011-v3
Unlocked	Yes	Yes	Yes	Yes

1. Not available on all SKUs.
2. See rebalancing cache hierarchy slide for details.
3. Motherboards must be Thunderbolt™ technology ready.
4. Requires additional system clocks to be provided by third-party components.

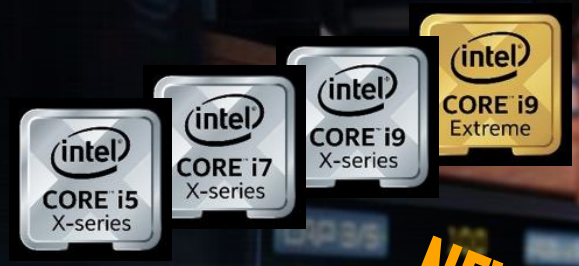
DESKTOP FAMILY FOR ENTHUSIAST EXPERIENCES

MAINSTREAM PERFORMANCE

- 77xx/76xx/75xx
- Four cores
- Up to 24 PCIe* lanes
- Two memory channels
- Premium UHD/4K content
- Intel® Optane™ memory ready and support for Intel® Optane™ SSDs

UNLOCKED PERFORMANCE

- 7700K/7600K
- Four cores
- Up to 24 PCIe lanes
- Two memory channels
- Premium UHD/4K content unlocked
- Intel® Optane™ memory ready and support for Intel Optane SSDs



EXTREME PERFORMANCE

NEW!

- 7980XE/7960X/7940X/ 7920X/7900X/7820X/ 7800X/7740X/7640X
- Core options: 18, 16, 14, 12, 10, 8, 6, and 4
- Up to 44 PCIe lanes
- Up to four memory channels unlocked
- Updated Intel® Turbo Boost Max Technology 3.0
- Intel® Optane™ memory ready and support for Intel Optane SSDs

SOLUTIONS FOR A RANGE OF USAGES

		Performance (KBL-S non K-series)	Unlocked performance (KBL-S K-series)	Extreme performance (X-series)[1]	Details
GAMING	1080P gaming	■	■	■	1x16 single graphics card on X-series
	QHD gaming		■	■	2x16 dual graphics card on X-series
	4K gaming or VR gaming		■	■	2x16 dual graphics card on X-series
	12K gaming			■	3x8 triple or 4x8 quad graphics cards on X-series
	4K/12K gaming and live streaming			■	CPU core count and native PCIe 3.0 lane usage
	4K/12K VR gaming and live streaming			■	CPU core count and native PCIe 3.0 lane usage
CONTENT CREATION	Photo editing	■	■	■	CPU core count (up to 18-core on X-series)
	1080P video editing	■	■	■	CPU core count (up to 18-core on X-series)
	360-degree video editing (VR content)	■	■	■	CPU core count (up to 18-core on X-series)
	4K video editing		■	■	CPU core count (up to 18-core on X-series)
	360-degree 4K video editing (VR content)			■	CPU core count (up to 18-core on X-series)
MUSIC CREATION	16 tracks	■	■	■	Up to 32 GB memory
	> 16 tracks			■	Beyond 32 GB
3D MODELING AND ANIMATION	3D SFX			■	CPU core count (up to 18-core on X-series)
	CAD design			■	CPU core count (up to 18-core on X-series)

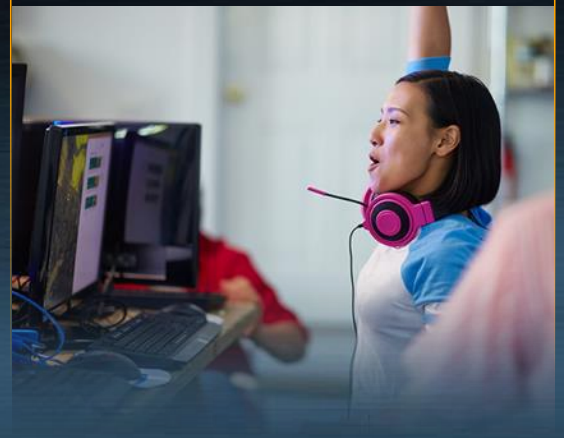
1. On select SKUs only: 6 cores to 18 cores.

NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

What's new …

UNPRECEDENTED SCALABILITY

EXTREME PERFORMANCE



EXTREME MEGA-TASKING

NEW OVERCLOCKING FEATURES

UNLOCKED INTEL® CORE™ X-SERIES PROCESSOR FAMILY

RETAIL PACKAGING

Intel® Core™ i9 X-series processor
Intel® Core™ i7 X-series processor
Intel® Core™ i5 X-series processor

Intel® Core™ i9 Extreme Edition processor

LEGAL DISCLAIMERS

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- All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest Intel product specifications and road maps.
- Intel processors of the same SKU may vary in frequency or power as a result of natural variability in the production process.
- 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.
- Warning: Altering PC clock or memory frequency and/or voltage may (i) reduce system stability and use life of the system, memory and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel assumes no responsibility that the memory, included if used with altered clock frequencies and/or voltages, will be fit for any particular purpose. Check with memory manufacturer for warranty and additional details.
- Tests measure performance of components on a particular test, in specific systems. Differences in hardware, software or configuration will affect actual performance. Consult other sources of information to evaluate performance as you consider your purchase. For more complete information about performance and benchmark results, visit intel.com/benchmarks.
- Results have been estimated 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.
- "Conflict-free" refers to products, suppliers, supply chains, smelters, and refiners that, based on our due diligence, do not contain or source tantalum, tin, tungsten or gold (referred to as "conflict minerals" by the U.S. Securities and Exchange Commission) that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo or adjoining countries.

All data measured on version: v1.0.0.1025 driver software and subject to change.


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