



NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

August 2017

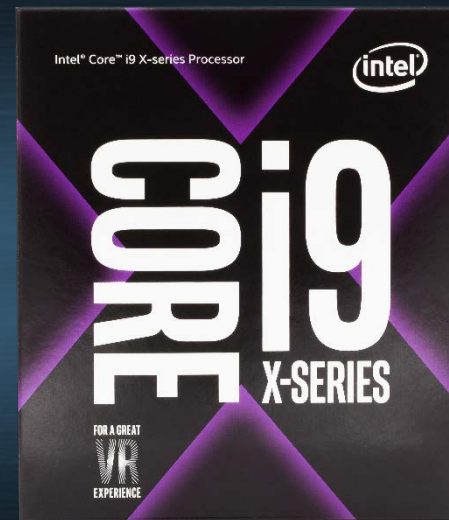
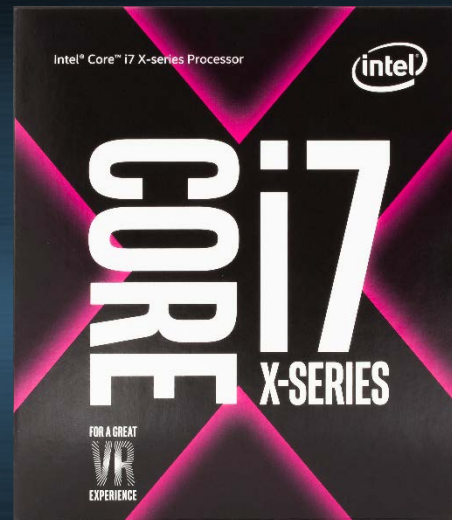
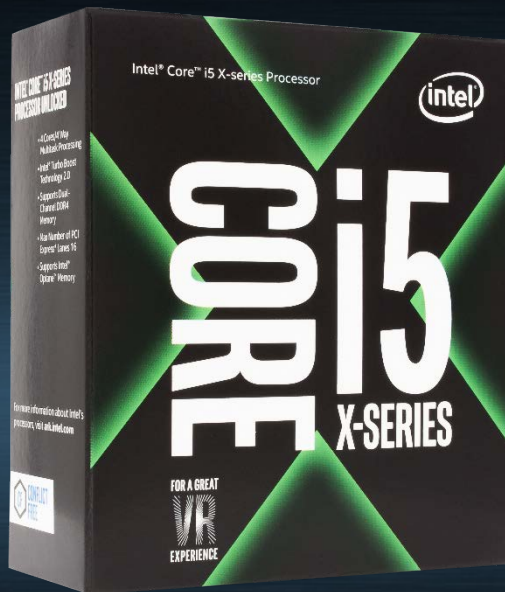


DESKTOP PROCESSOR MARKET GROWTH

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)



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

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

- Introducing the first Intel® Core™ Extreme Edition processor with 18 cores and 36 threads
- 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 15 percent faster multithread performance¹ than previous generation
- Up to 15 percent faster single-thread performance² than previous generation
- Massive 36-thread performance and quad-channel memory for content creation and extreme mega-tasking

ULTIMATE platform for gaming, VR, content creation and overclocking

- Up to 68 lanes of PCIe 3.0 on the platform to expand systems 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

NEW INTEL® CORE™ i9 EXTREME EDITION PROCESSOR

Intel's first 18-core desktop processor

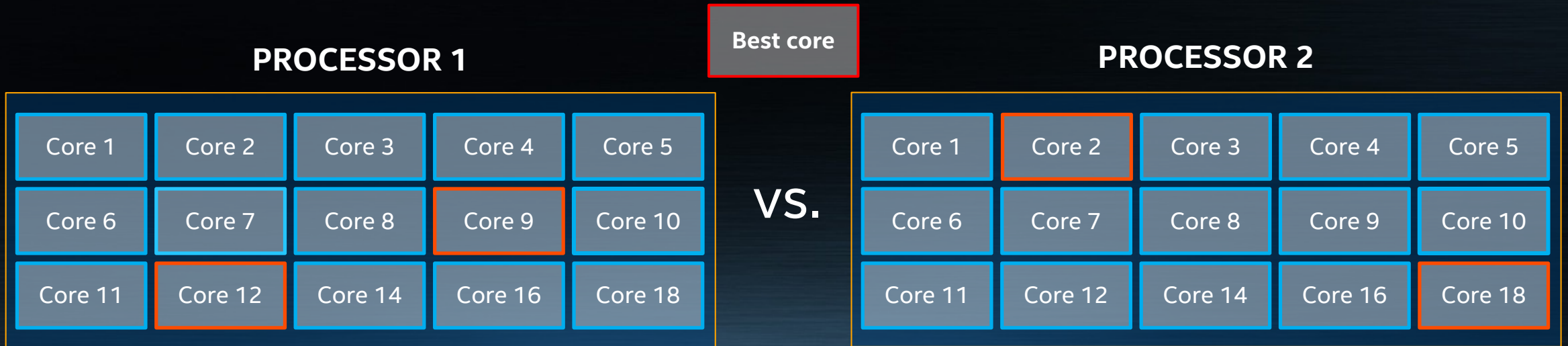
Intel's highest-performance processor for advanced gaming, VR and content creation

- New! 18 cores, 36 threads
- New! Teraflop CPU
- New! Support for Intel® Advanced Vector Extensions 512
- New! Intel® Optane™ memory
- Improved Intel® Turbo Boost Max Technology 3.0
- Support for LGA 2066 socket
- Up to 44 PCIe 3.0 lanes connected to the CPU and up to 24 connected to the PCH
- Four-channel DDR4-2666 memory support
- Fully unlocked for performance tuning
- Rebalanced Intel® Smart Cache hierarchy
- 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



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:

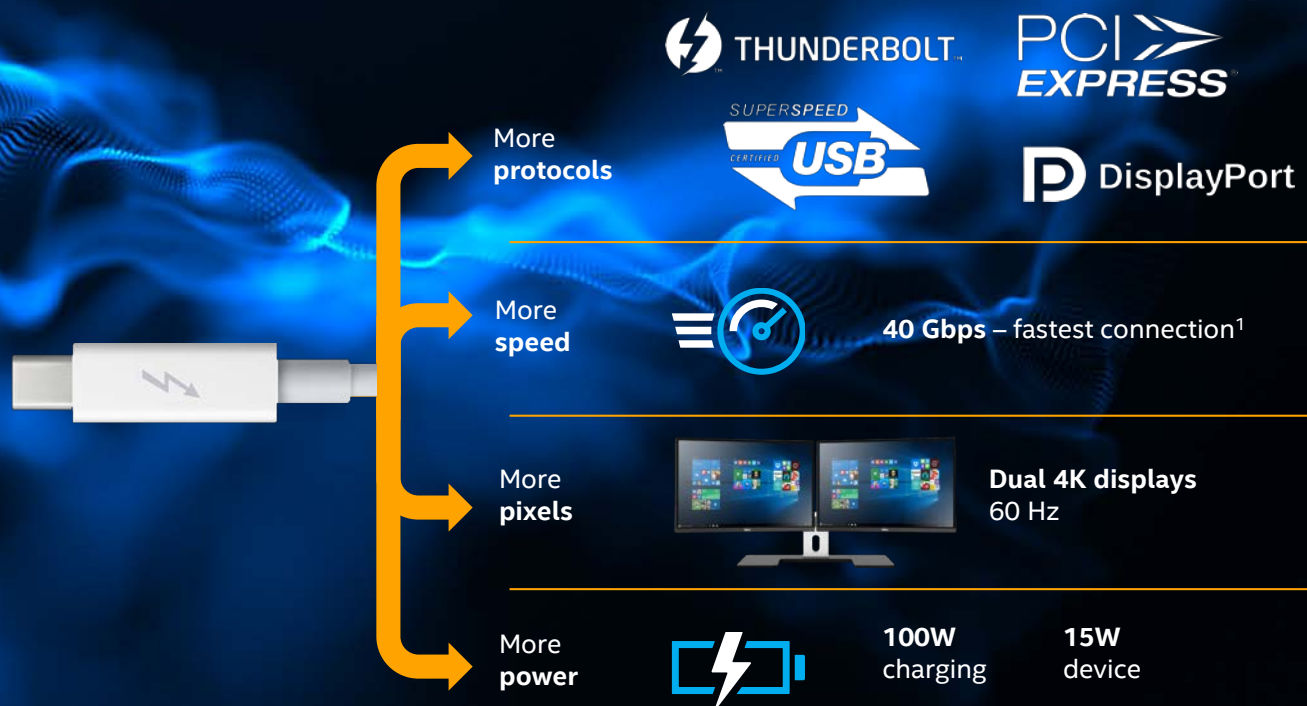
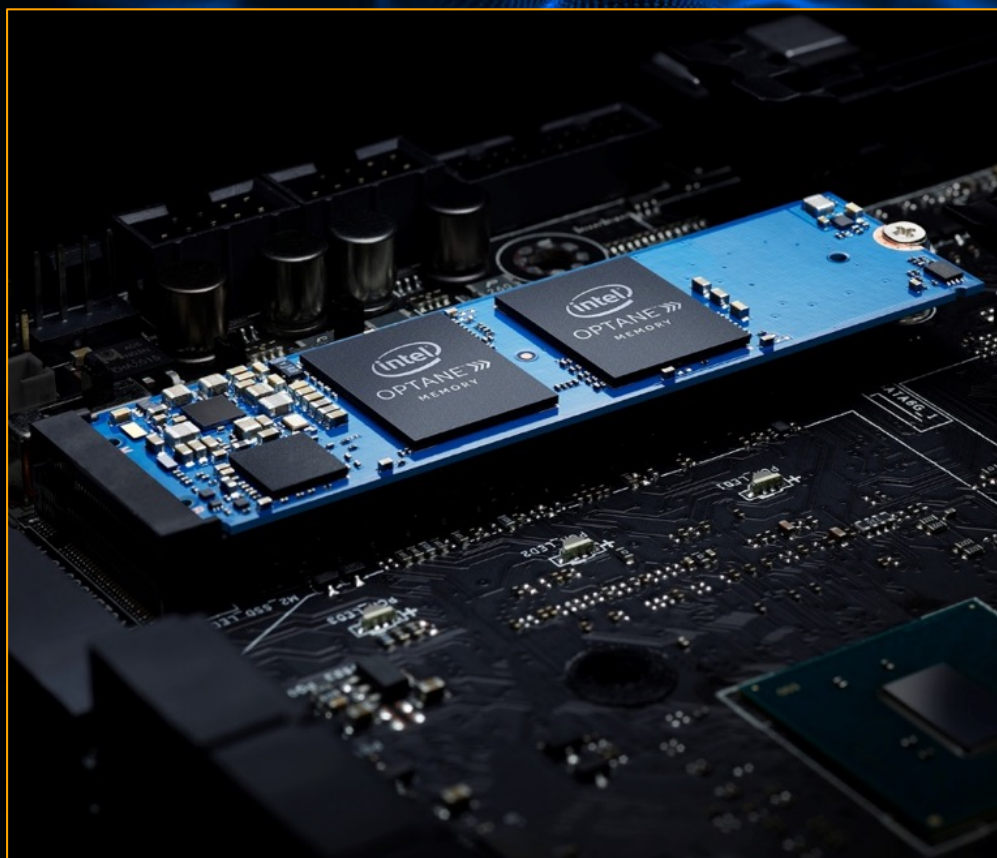
- Intel® Extreme Tuning Utility (Intel® XTU)
- Intel® Extreme Memory Profile 2.0 (Intel® XMP) technology

PEACE OF MIND

Upgrade option for overclockers:

- Performance tuning protection plan

INTEL® TECHNOLOGIES WORK TOGETHER FOR OPTIMAL PERFORMANCE



1 As compared to any other connection to the PC

INTEL® LIQUID COOLING TS13X

HIGH-PERFORMANCE THERMAL SOLUTION FOR ENTHUSIASTS

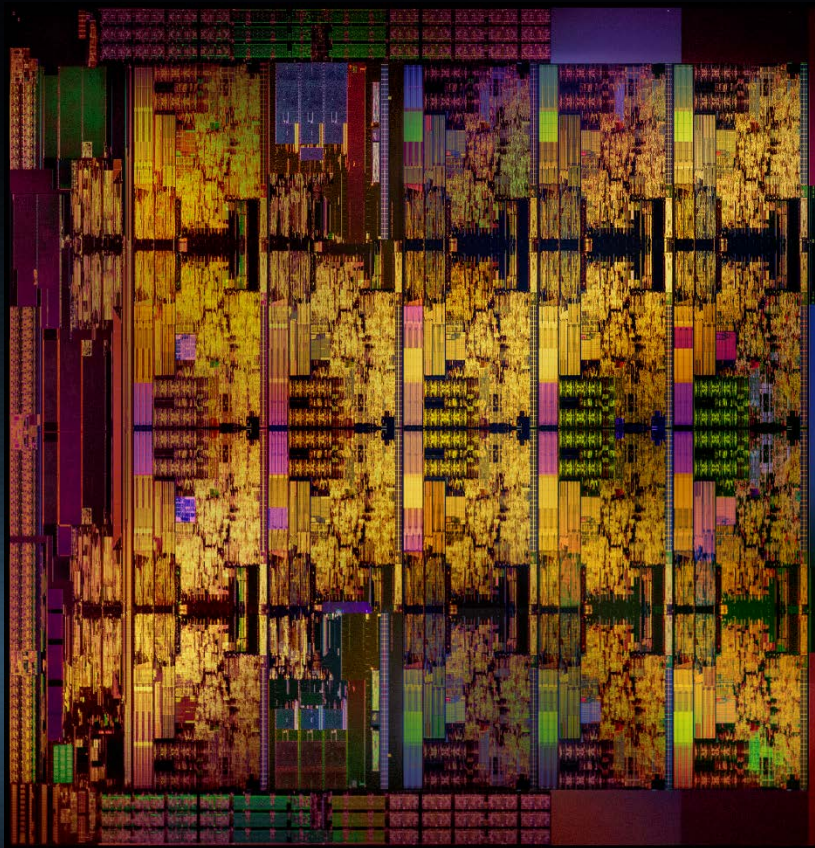
Separate boxed SKU available from distribution and at retail



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 hierarchy¹

Intel®
Turbo Boost Technology

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

Skylake-X and Kaby Lake-X
processors

Discrete
graphics

Support for
up to four-
channel DDR4



DMI



Intel® X299
Chipset

Update: Intel® Turbo Boost Max
Technology 3.0²

Support for overclocking with
extreme edition and “X” SKUs

Integrated memory controller:
Up to four channels DDR4 2666²

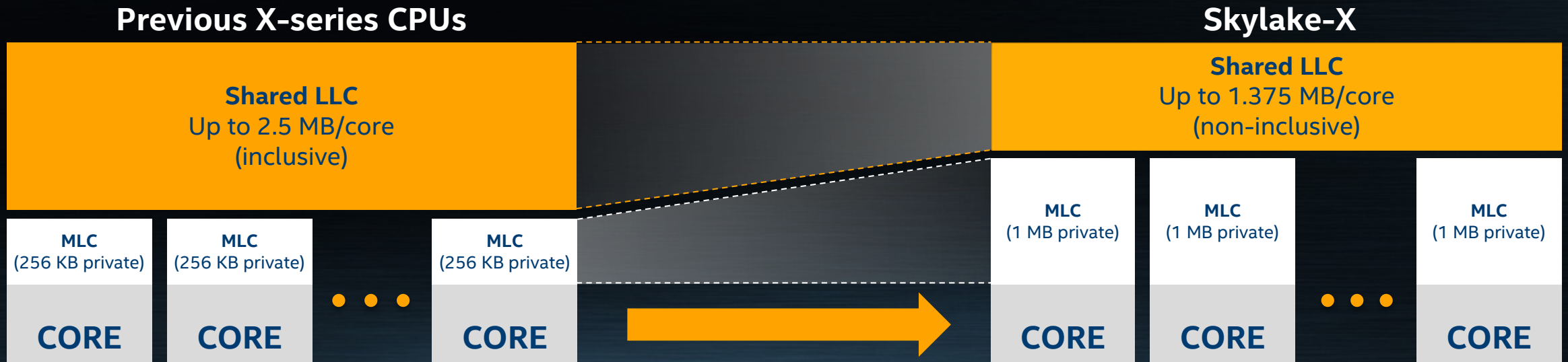
Up to 44 lanes PCIe 3.0
connected on the CPU and up to 24
connected on the PCH

Power = 140W³
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 HIERARCHY¹



- 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

INTEL® X299 CHIPSET

Redefines the enthusiast desktop experience

INCREASED SYSTEM RESPONSIVENESS

Intel® Optane™ memory ready¹

Faster throughput times with DMI 3.0²

IMPROVED I/O CAPABILITIES

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

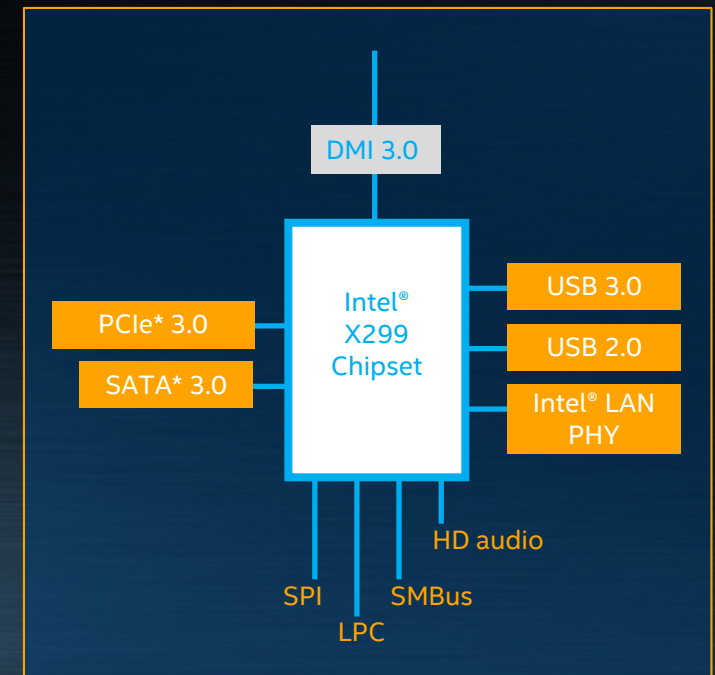
- Up to 24 PCIe 3.0 lanes
- Up to 8 SATA 3.0 ports
- Up to 10 USB 3.0 ports

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

Genuine 捷元

NCIX

DIGITALSTORM



天猫 Tmall.COM

ORIGIN

ASRock



GIGABYTE™

msi™



Komputronik



pcspecialist

ASUS®

acer



Available at
amazon



SCAN®

GTUNE | mouse

MSY Technology



ALIENWARE™



Lenovo™



EVGA

Not a comprehensive list of customers and partners

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

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 (1K USD)
i9-7980XE NEW	2.6	4.2	4.4	18/36	24.75 MB	44	Four channels DDR4-2666	165W	2066	\$1,999
i9-7960X NEW	2.8	4.2	4.4	16/32	22 MB	44	Four channels DDR4-2666	165W	2066	\$1,699
i9-7940X NEW	3.1	4.3	4.4	14/28	19.25 MB	44	Four channels DDR4-2666	165W	2066	\$1,399
i9-7920X NEW	2.9	4.3	4.4	12/24	16.5 MB	44	Four channels DDR4-2666	140W	2066	\$1,199
i9-7900X NEW	3.3	4.3	4.5	10/20	13.75 MB	44	Four channels DDR4-2666	140W	2066	\$999
i7-7820X NEW	3.6	4.3	4.5	8/16	11 MB	28	Four channels DDR4-2666	140W	2066	\$599
i7-7800X NEW	3.5	4.0	NA	6/12	8.25 MB	28	Four channels DDR4-2400	140W	2066	\$389
i7-7740X NEW	4.3	4.5	NA	4/8	8 MB	16	Two channels DDR4-2666	112W	2066	\$339
i5-7640X NEW	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](https://www.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 24.75 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	165W, 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



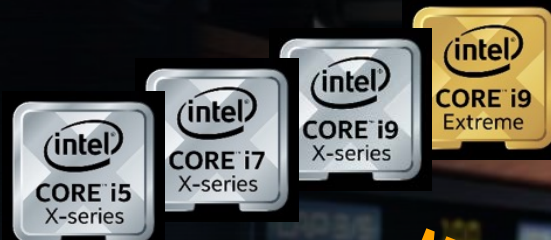
MAINSTREAM PERFORMANCE

- 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
- Intel® Optane™ memory 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



NEW INTEL® CORE™ X-SERIES PROCESSOR FAMILY

What's new ...

UNPRECEDENTED SCALABILITY



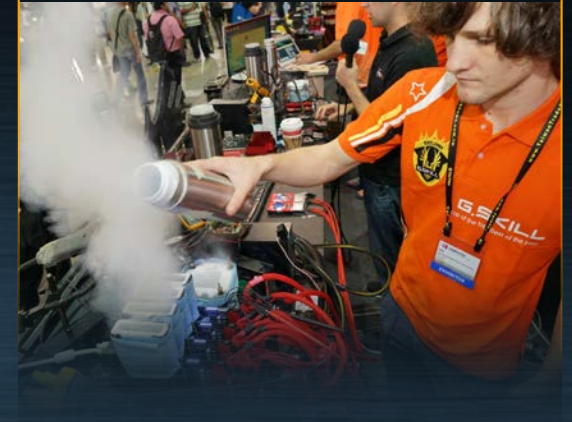
EXTREME PERFORMANCE



EXTREME MEGA-TASKING

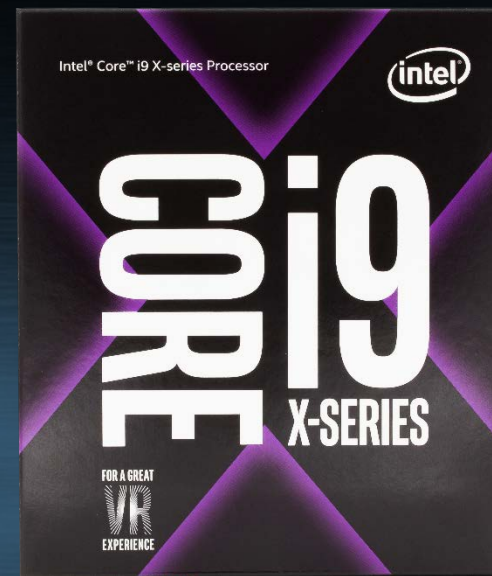
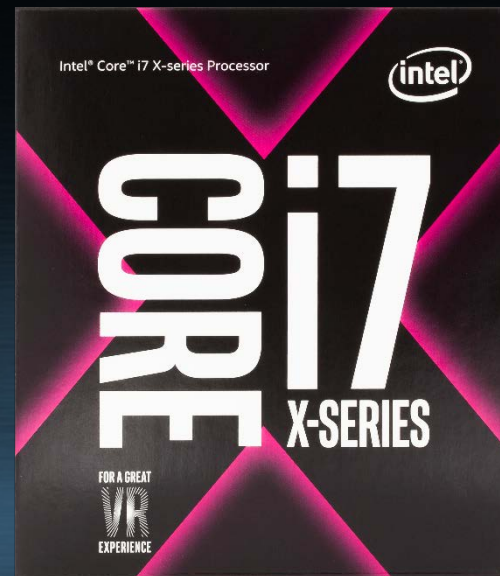
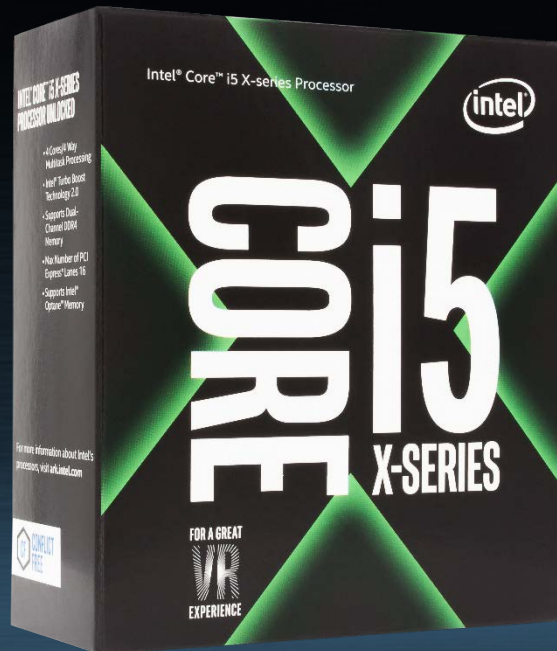


NEW OVERCLOCKING FEATURES



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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- 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](https://www.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](https://www.intel.com/benchmarks).
- 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 –and– 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

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

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