9TH GENERATION INTEL® CORE™ DESKTOP PROCESSORS

The Most Powerful Generation of Intel® Core™ Processors

Introducing the NEW 9th Gen Intel® Core™ desktop processors - the most powerful generation of Intel® Core™ desktop processors. Whether you are a gamer looking for a fantastic in-game experience with the performance headroom for smooth live streaming and seamless highlights recording or you are a creator that is ready to do more creating and sharing, less time waiting, this new generation of processors is ready to take you to that new level.

A NEW LEVEL OF PERFORMANCE

The 9th Gen Intel® Core™ processor takes mainstream desktop PC performance to a whole new level. At the top of the stack, our mainstream flagship, the new i9-9900K. The first Intel® Core™ i9 desktop processor for the mainstream users. Best in class, the i9-9900K with 16MB of cache[1] and Intel® Turbo Boost 2.0 technology cranks maximum turbo frequency up to blazing 5.0 GHz. Throw in high performing 16-way multitasking support powered by 8 cores with Intel® Hyper-Threading Technology to conquer the most demanding workloads. Want to reach for even greater levels of performance? — Overclock confidently with new and enhanced features like Solder Thermal Interface Material (STIM) and improved overclocking customizations to tweak the processor performance to its unleashed potential. [2]

The NEW 9th Generation of Intel® Core™ desktop processor delivers:

• A range of processors including the first unlocked Intel® Core™ i9 mainstream desktop processor.

• Data acceleration when paired with Intel® Optane™ memory to retrieve that data you use the most for fast system responsiveness.[1]

• DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds.

• Intel Z390 chipset support which includes unprecedented connectivity to all of your devices with integrated USB 3.1 Gen 2, Intel® Wireless-AC and support for Gigabit Wi-Fi speed.

• Compatible with Intel ® 300 series chipset.

GAME ON A WHOLE NEW LEVEL

Game, Record, Stream without compromise on a system powered by a 9th generation Intel® Core™ i9 processor.

Utilize Intel® Quick Sync Video technology to live-stream, capture, and multitask without interruption. Power up and customize your gaming rig with up to 40 platform PCIe lanes giving you the outstanding flexibility.

Pair it with Intel® Optane™ memory technology to accelerate the loading and launching of the games you play the most.

CREATE WITHOUT LIMITS

Unlock your creative potential with the power you need to create, edit and share. Let your creativity flow as the 9th generation Intel® Core™ processor renders and encodes in the background so you don't miss a beat. Minimize the wait time between inspiration and creation with Intel® Optane™ memory accelerating the loading of your most used applications.

ULTRA-HIGH DEFINITION ENTERTAINMENT

Desktop computers based on the 9th Generation Intel® Core™ processors integrate advanced media technologies that bring premium, high-quality content to your desktop, including:

- HEVC 10-bit encode/decode, VP9 10-bit decode:
  - Delivering smooth streaming of premium 4K UHD entertainment to your PC from leading online providers.
  - Providing full-size, screen-immersive viewing experiences with 4K video and 360-degree viewing.
- High Dynamic Range (HDR) and Rec. 2020 (Wide Color Gamut) for life-like luminesces to provide enhanced image and video viewing experiences.

HARDWARE BASED SECURITY[1]

9th Generation Intel® Core™ processors integrate hardware level technologies that help strengthen the protection of your enabled security[1] software. Hardware-based security helps you experience online and offline activities with added peace of mind, enabled by features that include:

• Intel® Software Guard Extensions (Intel® SGX)[1] to help applications protect your system and your data.

• Intel® BIOS Guard and Intel® Boot Guard to help protect your system during startup.
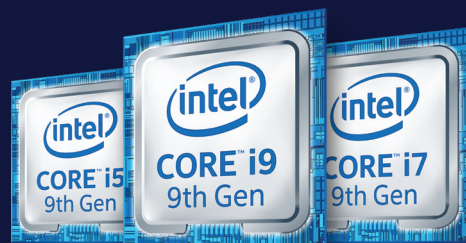
SCALABLE PORTFOLIO OF PROCESSORS

A 9th Generation Intel® Core™ processor is a great investment in your desktop experiences — whether for gaming, creating, entertainment, or general purpose computing — wherever your life takes you.

From the bar-raising performance of the 9th Generation Intel® Core™ i9-9900K processor with up to 5GHz and 16-way multitasking to great value entry-level performance options down the stack, our latest generation of desktop processors offers a range of options for your budgets and needs.
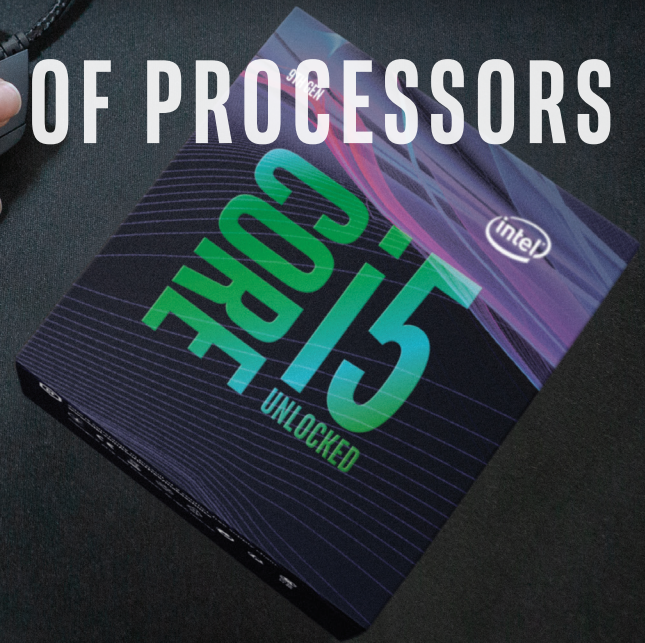
STEP UP TO THE NEXT LEVEL WITH 9TH GEN INTEL® CORE™ DESKTOP PROCESSORS

9th Gen is the most powerful generation of Intel® Core™ desktop processors, with features and enhancements to evoke excitement in what you love to do. Step up to a 9th Gen Intel® Core™ processor-powered PC and experience the difference.

9TH GENERATION INTEL® CORE™ DESKTOP PROCESSOR - FEATURES AT A GLANCE

FEATURES[1]	BENEFITS
Intel® Turbo Boost Technology 2.0	Dynamically increases the processor's frequency, as needed, by taking advantage of thermal and power headroom when operating below specified limits.
Intel® Hyper-Threading Technology	Delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.
Intel® Smart Cache	Dynamically allocates shared cache to each processor core, based on workload, reducing latency and improving performance.
Integrated Memory Controller	Offers stunning memory read/write performance through efficient pre-fetching algorithms, lower latency, and higher memory bandwidth.
Intel® UHD Graphics	Play 4K UHD videos with exceptional clarity, view and edit even the smallest details of photos, and play today's modern games.
Intel® Quick Sync Video	Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring.
Processor Core/Memory/ Graphics Overclocking[2]	When unlocked processors are paired with select chipset SKUs, processor core, graphics, and memory can be set to run at frequencies above the specification frequency of the processor resulting in higher performance.[2]
PCI Express* 3.0 Interface	Offers up to 8 GT/s for fast access to peripheral devices with up to 16 lanes.[4] The lanes can be configured as 1x16, 2x8, or 1x8 and 2x4 depending on motherboard designs.
Intel® Optane™ Memory Support	Smart memory technology that accelerates computers' responsiveness. It accesses your computer's frequently used documents, pictures, videos and applications quickly and remembers them after you power off — enabling you to create, game, and produce with less waiting.
Intel® Power Optimizer and Processor C-States	Intel® Power Optimizer increases periods of silicon sleep state across the platform ingredients, including the processor, chipset, and third-party system components, to reduce power. Processor C-states (C8-C10) provide low idle power.
Intel® Virtualization Technology	Allows one hardware platform to function as multiple "virtual" platforms. Offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions.
VMCS Shadowing	VMCS shadowing allows a Virtual Machine Manager (VMM) running in a guest (nested virtualization) to access a shadow VMCS memory area using the normal VMRead/VMWrite instructions. This technology reduces overhead for a more natural and responsive user experience. It also allows users to take control of their personal and professional data and apps while being protected by game-changing security.
Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)	A set of instructions that can be used to accelerate a variety of encryption apps, including whole disk encryption, file storage encryption, conditional access of 4K UHD content, Internet security, and VoIP. Consumers benefit from internet and email content protection, plus fast, responsive disk encryption.
Intel® Transactional Synchronization Extensions (Intel® TSX)	A set of instructions focused on enterprise-level multi-threaded performance scaling, making parallel operations more efficient via improved control of software threads and locks. This offers performance benefits for enterprise-level big data analytics/business intelligence and visualization apps, which involve multi-user collaboration.
Intel® Advanced Vector Extensions 2 (Intel® AVX2)[3]	A set of 256-bit instructions to deliver enhanced performance on floating point- and integer-intensive apps. Includes instructions for FMA (Fused Multiply Add) which can deliver better performance on media and floating point computations, including face recognition, professional imaging, high-performance computing, consumer video and imaging, compression, and encryption.
Intel® Software Guard Extensions (Intel® SGX)	A collection of instructions, APIs, libraries, and tools to help protect select code and data from disclosure or modification through the use of enclaves, which are protected areas of execution in memory.
Intel® BIOS Guard	An augmentation of existing chipset-based BIOS flash protection capabilities targeted to address the increasing malware threat to BIOS flash storage. It helps protect the BIOS flash from modification without platform manufacturer authorization, helps defend the platform against low-level DOS (denial of service) attacks, and helps restore BIOS to a known good state after an attack.
Intel® Boot Guard	Hardware-based boot integrity protection that helps prevent unauthorized software and malware takeover of boot blocks critical to a system's function, thus providing added level of platform security based on hardware. Configurable boot types include: Measured Boot – measures the initial boot block into the platform storage device such as a trusted platform module (TPM) or Intel® Platform Trust Technology. Verified Boot – cryptographically verifies the platform initial boot block using the boot policy key.
Intel® OS Guard	A hardware-based security feature that protects the OS (operating system) kernel. OS Guard helps prevent use of malicious data or attack code located in areas of memory marked as user mode pages from taking over or compromising the OS kernel. OS Guard is not application-specific and protects the kernel from any application.
Intel® Identity Protection Technology	Protect your one-time-password (OTP) credentials and public key infrastructure (PKI) certificates and add a layer of encrypted, second factor authentication for online transactions.
Intel® Secure Key	Security hardware-based random number generator that can be used for generating high-quality keys for cryptographic (encryption and decryption) protocols. Provides quality entropy that is highly sought after in the cryptography world for added security.

9TH GENERATION INTEL® CORE™ DESKTOP PROCESSOR COMPARISONS[1]

	CORE i9	CORE i7	CORE i5
Maximum Processor Frequency (GHz)	Up to 5.0	Up to 4.9	Up to 4.6
Number of Processor Cores/Threads	8/16	8/8	6/6
Intel® Turbo Boost Technology 2.0	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	No	No
Intel® Smart Cache Size (MB)	16	12	9
Memory Type Support	DDR4-2666	DDR4-2666	DDR4-2666
Number of Memory Channels	2	2	2
Intel® UHD Graphics	630	630	630
Graphics Dynamic Frequency (MHz)	Up to 1200	Up to 1200	Up to 1200
Intel® Quick Sync Video	Yes	Yes	Yes
Processor Core/Graphics/Memory Overclocking[2]	Yes (with select SKUs)	Yes (with select SKUs)	Yes (with select SKUs)
Intel® Optane™ Memory Support	Yes	Yes	Yes
Intel® Virtualization Technology	Yes	Yes	Yes
Intel® AES-NI	Yes	Yes	Yes
Intel® TSX	Yes	Yes	Yes
Intel® AVX2[3]	Yes	Yes	Yes
Intel® SGX	Yes	Yes	Yes
Intel® BIOS Guard	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes

9th Generation Intel® Core™ desktop processors require a motherboard based on the Intel® 300 Series chipset.

For more information on the new 9th Generation Intel® Core™ desktop processor family, visit **www.intel.com/products/desktop/processors.**