

Introducing New 13th Gen Intel® Core™ Processor Family

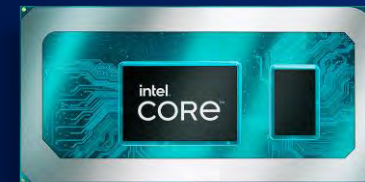
Desktop

S-series 35/65/125W



Mobile

U, P, H, HX-series



The World's Fastest Desktop Processor

13th Gen Intel® Core™ i9-13900K

Fastest
P-Cores

5.8GHz

Double
E-Cores

24C / 32T

Larger
L2 Caches

2MB per P-core
4MB per E-core cluster

Delivering up to **15% ST** and **41% MT** Performance

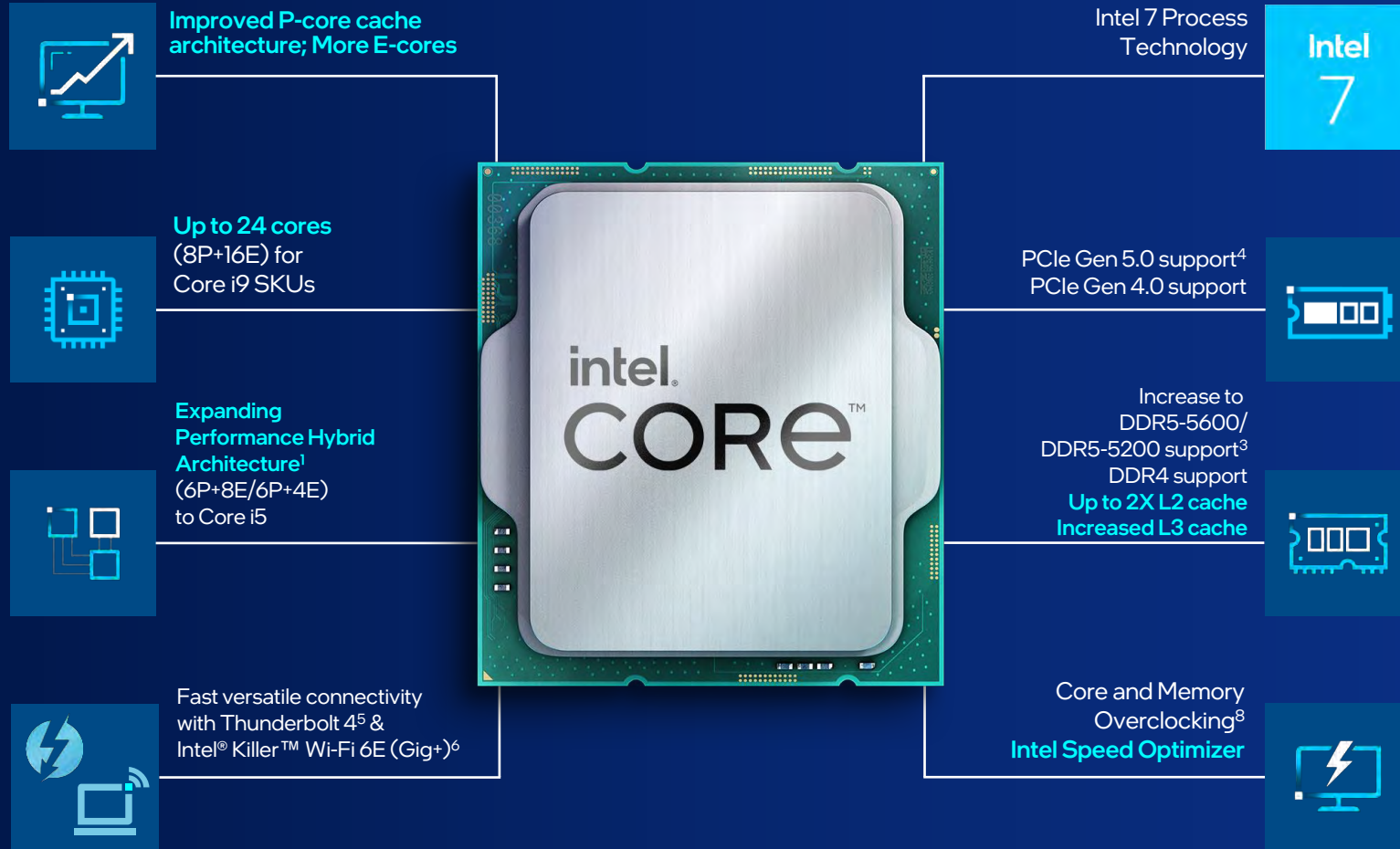
Source Intel: As estimated by measurements made using SPECint_rate_base2017_IC2022.1(1-copy & n-copy) using Intel validation Platforms comparing Core i9 13900K versus Core i9 12900K



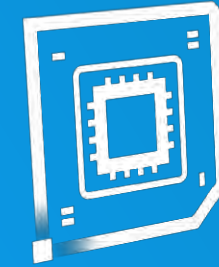
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For all workloads and configuration see www.intel.com/PerformanceIndex. Results may

13th Gen Desktop Processors: Unleashing the Ultimate Gaming Platform



intel



CHIPSET
Z790

Increased
Chipset
PCIe
Gen 4.0

Increased
USB 3.2
Gen 2x2
20Gbps

World's Best Overclocking Experience

Enhanced Experiences

- New Per Core Tuning Visualizations with Intel® Extreme Tuning Utility
- Easy 1-Click Overclocking with the Intel® Speed Optimizer feature and new simplified "Compact View"
- Robust Memory OC with Extreme Memory Profile 3.0 technology (XMP) offers 1-click automatic memory overclocking experiences with both DDR4 and DDR5

Extreme Tuning Utility

The screenshot displays the Intel Extreme Tuning Utility (XTU) interface. It is divided into two main sections: "Performance Cores" and "Efficient Cores".

Performance Cores: Shows a grid of 8 cores (P-Core 0 to P-Core 7) with a "Ratio" column set to 60x for all. A "Selected Core" panel for "Performance Core 0" shows settings: Ratio Multiplier (60.000 x), Voltage Mode (Static), Voltage Override (1.449 V), Voltage Offset (0.000 V), Intel Thermal Velocity Boost (disabled), Temperature (0.000 °C), Ratio Offset (Disable), Temperature #2 (0.000 °C), and Ratio Offset #2 (Disable).

Efficient Cores: Shows a grid of 16 cores (E-Core 0 to E-Core 15) with a "Ratio" column set to 45x for all. A "Selected Core" panel for "Efficient Core 0" shows settings: Ratio Multiplier (45.000 x), Voltage Mode (Static), Voltage Override (1.449 V), and Voltage Offset (0.000 V).

Intel® Speed Optimizer

The screenshot displays the Intel Speed Optimizer interface. It features a prominent "Automatic Overclock" button at the top. Below it, the "Manual Tuning" section is visible, showing sliders for:

- Performance Core Ratio: 47x
- Efficient Core Ratio: 36x
- Core Voltage Offset: 0.000 V

At the bottom, there are buttons for "Advanced View", "Apply", and "Discard".

Based on enhanced overclocking ability enabled by Intel's comprehensive tools and unique architectural tuning capabilities. Your results may vary. Overclocking may void warranty or affect system health. For details see [intel.com/overclocking](https://www.intel.com/overclocking). For all workload and configuration see www.intel.com/PerformanceIndex. Results may vary.

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Huge Generational Gains Across the Stack

Intel Core
i5-13600K
14-core up to 5.1 GHz



+4 cores, +4 threads
+200 MHz Turbo

Intel Core
i7-13700K
16-core up to 5.4 GHz



+4 cores, +4 threads
+400 MHz Turbo

Intel Core
i9-13900K
24-core up to 5.8 GHz



+8 cores, +8 threads
+600 MHz Turbo

Raptor Lake

The Fastest Performance Core

Upgraded Intel 7 Process

3rd gen Intel SuperFin transistor
Significantly better channel mobility

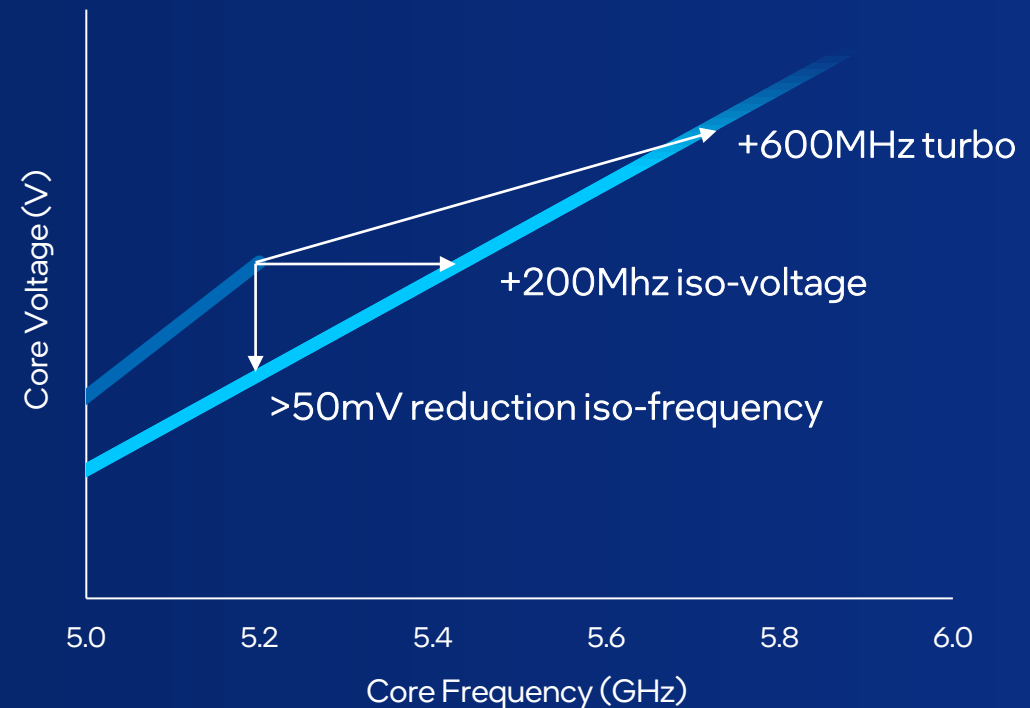
Faster 'Raptor Cove' Core

Updated design with improved speed paths
Up to 600MHz faster

Larger L2 Cache

2MB L2 cache per core
New dynamic prefetcher algorithm "L2P"

Shifting the V-F Curve



Raptor Lake

Double the Efficient-Cores¹

Wider

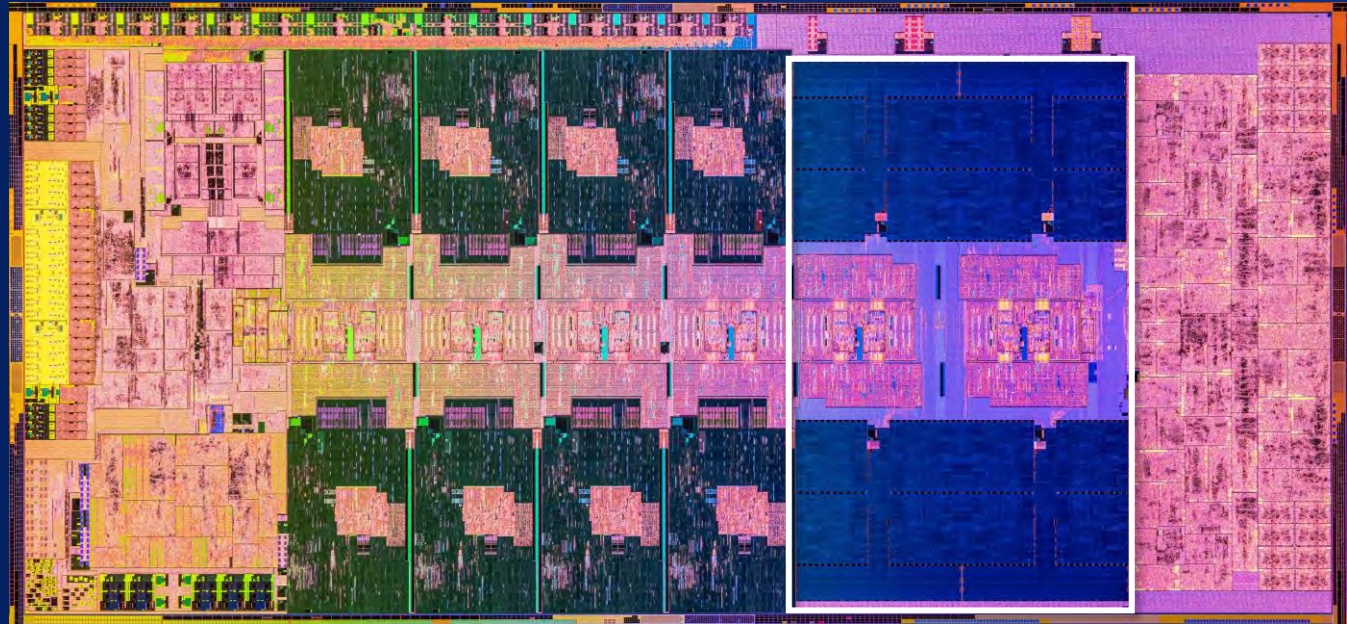
Up to 16 E-cores
4MB L2 per cluster

Faster

Up to 600MHz faster (ACT)
Up to 4.3GHz turbo

Smarter

Significantly optimized
prefetcher algorithm



Raptor Lake

Better Memory Latency & Bandwidth

Faster DDR5³

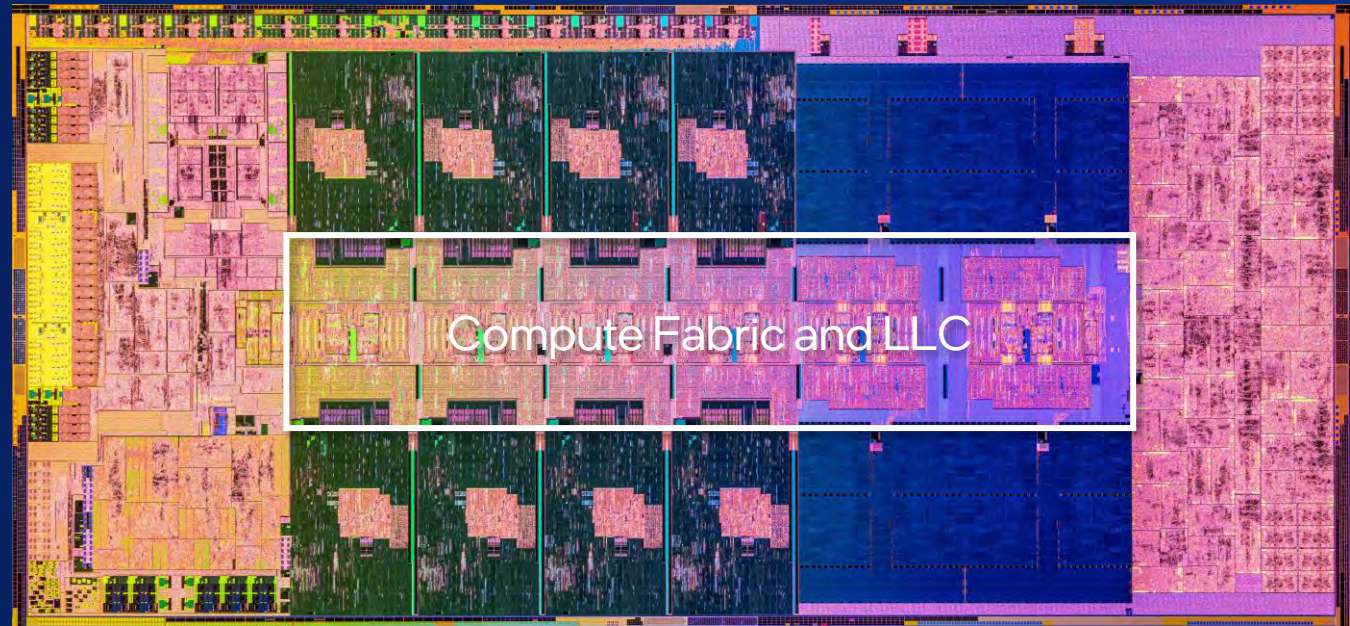
Up to 5600 MT/s with 1DPC
Up to 4400 MT/s with 2DPC

Faster Fabric

Up to 900MHz faster (ACT)
Up to 5.0GHz max turbo

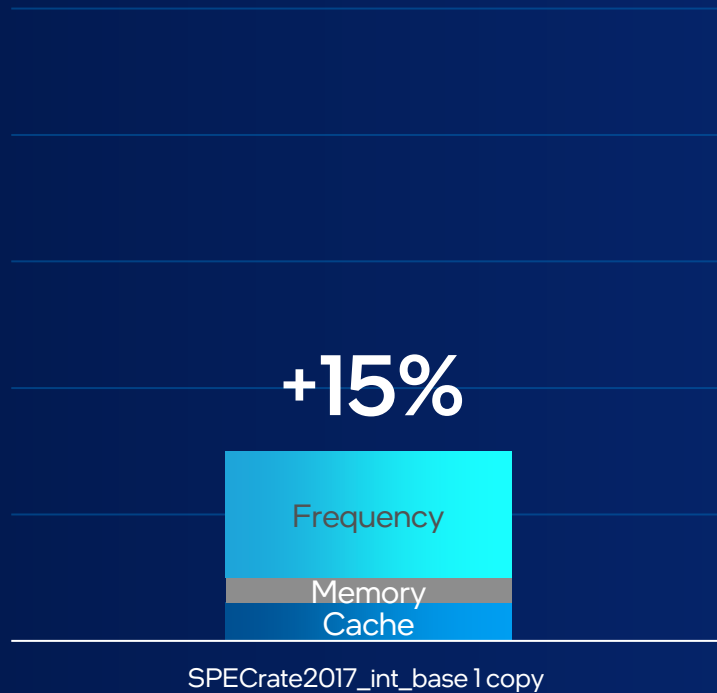
Larger LLC

Up to 36MB shared L3
New dynamic inclusive/non-inclusive "INI"

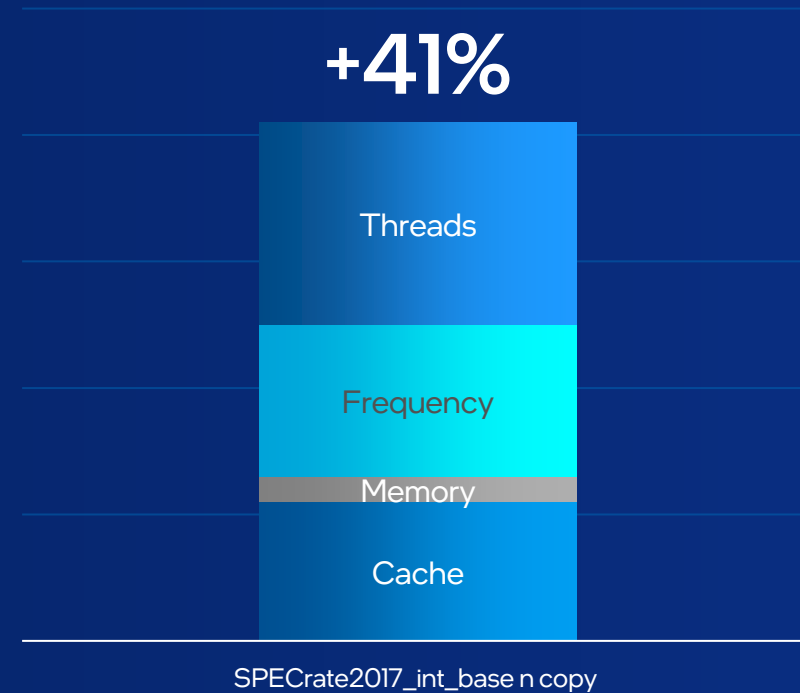


Raptor Lake Leading Performance

Single Thread Performance



Multi Thread Performance



Source Intel: As estimated by measurements made using SPECint_rate_base2017_IC2022.1 (1-copy & n-copy) using Intel validation Platforms comparing Core i9 13900K versus Core i9 12900K. Frequency includes enhancements to the CPU and the Fabric.

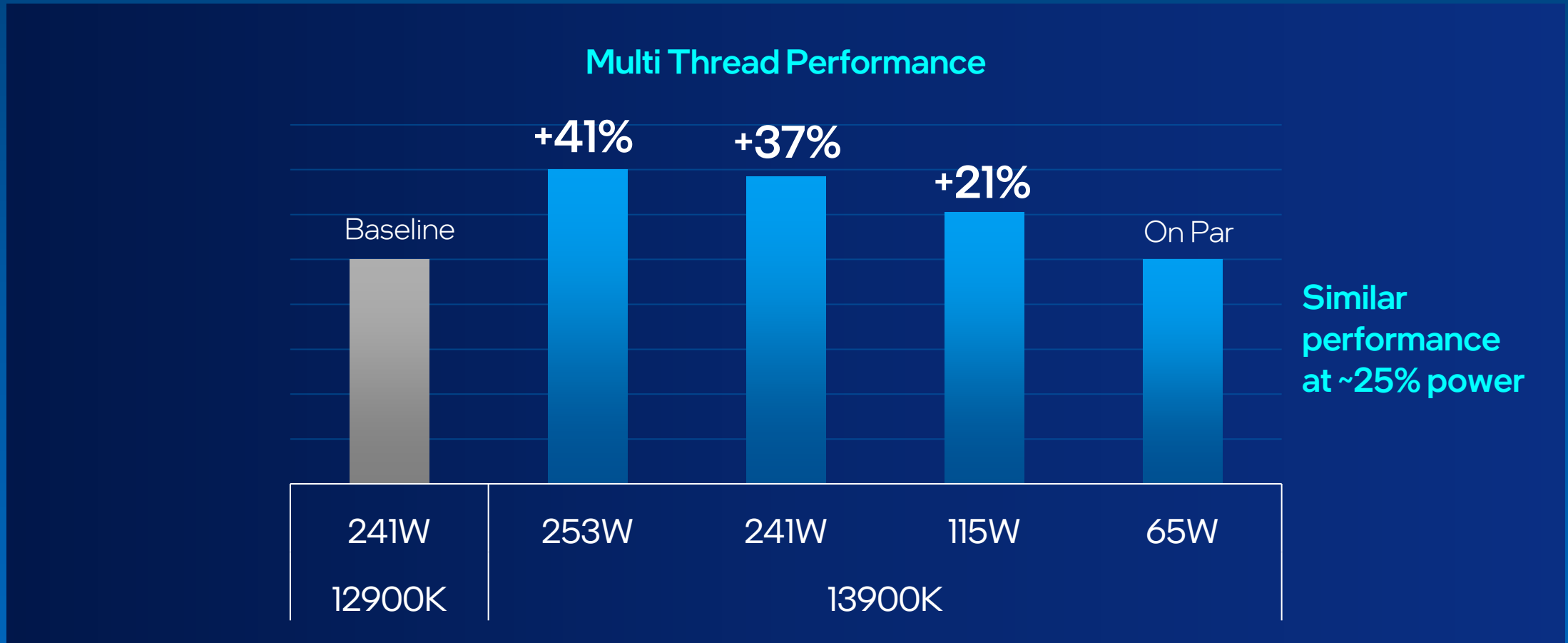


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Raptor Lake

Scalable Performance per Watt



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Raptor Lake

Software Improvements

Intel Thread Director²

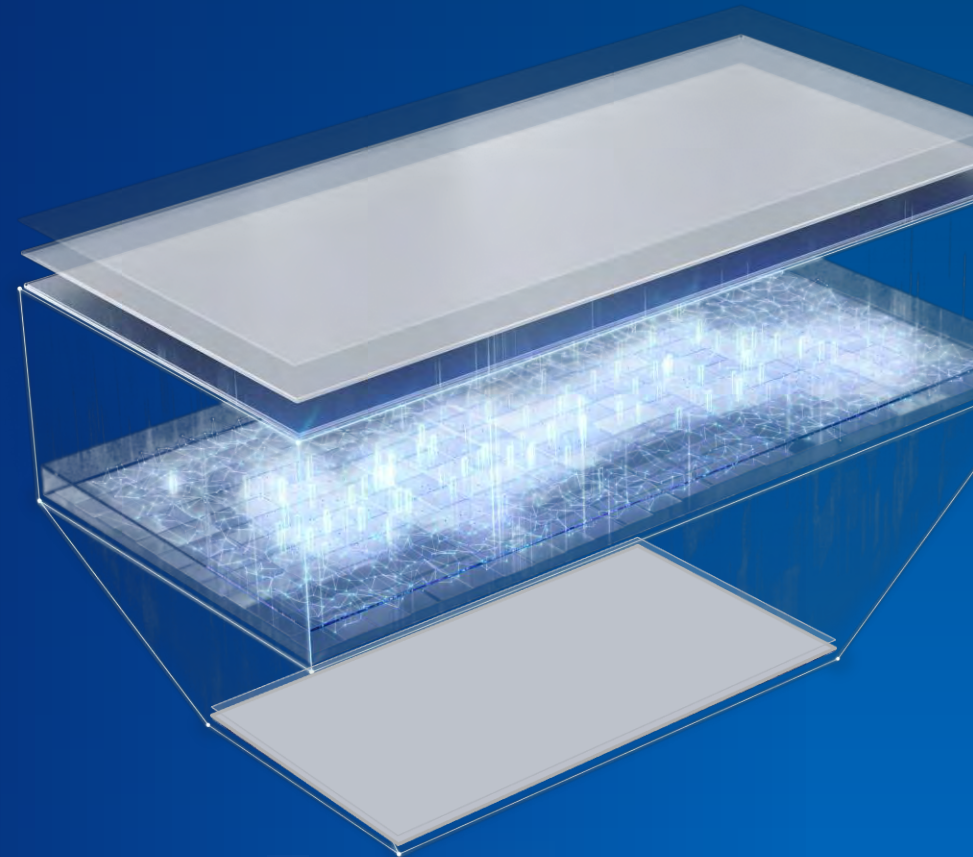
Updated thread class boundaries (0,1,2,3)
via machine learning techniques

Windows 11 22H2

Optimized handling of background services (utility QoS)
vs. user-initiated background tasks (low QoS)

Dynamic Tuning Technology

Coming soon to mobile ... new core parking techniques



13th Gen Intel® Core™ Unlocked Desktop Processors

Processor Number	Processor Cores (P+E)	Processor Threads	Intel® Smart Cache (L3)	Total L2 Cache	P-core Max Turbo Frequency (GHz)	E-core Max Turbo Frequency (GHz)	P-core Base Frequency (GHz)	E-core Base Frequency (GHz)	Unlocked	Processor Graphics	Total CPU PCIe Lanes	Max Memory Speed (MT/S)	Memory Capacity	Processor Base Power (W)	Max Turbo Power (W)	RCP (USD)
i9-13900K	24 (8+16)	32	36MB	32MB	Up to 5.8	Up to 4.3	3.0	2.2	√	Intel® UHD Graphics 770	20	DDR5 5600 DDR4 3200	128GB	125	253	\$589
i9-13900KF	24 (8+16)	32	36MB	32MB	Up to 5.8	Up to 4.3	3.0	2.2	√	n/a	20	DDR5 5600 DDR4 3200	128GB	125	253	\$564
i7-13700K	16 (8+8)	24	30MB	24MB	Up to 5.4	Up to 4.2	3.4	2.5	√	Intel® UHD Graphics 770	20	DDR5 5600 DDR4 3200	128GB	125	253	\$409
i7-13700KF	16 (8+8)	24	30MB	24MB	Up to 5.4	Up to 4.2	3.4	2.5	√	n/a	20	DDR5 5600 DDR4 3200	128GB	125	253	\$384
i5-13600K	14 (6+8)	20	24MB	20MB	Up to 5.1	Up to 3.9	3.5	2.6	√	Intel® UHD Graphics 770	20	DDR5 5600 DDR4 3200	128GB	125	181	\$319
i5-13600KF	14 (6+8)	20	24MB	20MB	Up to 5.1	Up to 3.9	3.5	2.6	√	n/a	20	DDR5 5600 DDR4 3200	128GB	125	181	\$294

Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families.

The frequency of cores and core types varies by workload, power consumption and other factors. Visit <https://www.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-technology.html> for more information. Max Turbo Frequency for P-cores may include Intel® Thermal Velocity Boost and/or Intel Turbo Boost Max 3.0.

All SKUs listed above support up to DDR5 (5600 MT/S)/DDR4 (3200 MT/S) memory. See ark.intel.com for more specification details



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The World's Fastest Desktop Processor

13th Gen Intel® Core™ i9-13900K

Up to

5.8 GHz

15% better ST

41% better MT

Up to

**24% Better
Gaming
Performance**

Up to

**34% Faster
Creator
Workflow**

The World's Best Gaming Experience
A Leap in Content Creation
Unmatched Overclocking Experience
Platform Innovation & Flexibility

Claims as of Sept. 7, 2022. Intel Core i9-13900K is the world's fastest desktop processor at 5.8 GHz. World's Best Gaming Experience based on performance and unique features of unlocked 13th Gen Intel Core processors, including in comparison to 12th Gen Intel Core, AMD Ryzen 9 5950X and AMD Ryzen 7 5800X3D.

Subject to Embargo Lift – Sept. 27th, 2022 @ 9:20 AM PT

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