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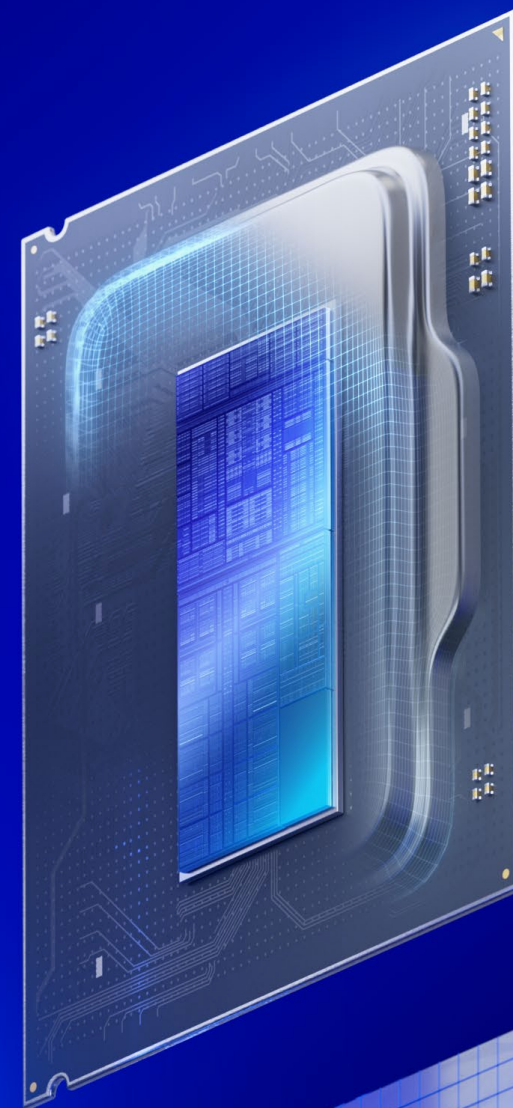
# Intel® Core™ Ultra Desktop Processors Launch Briefing

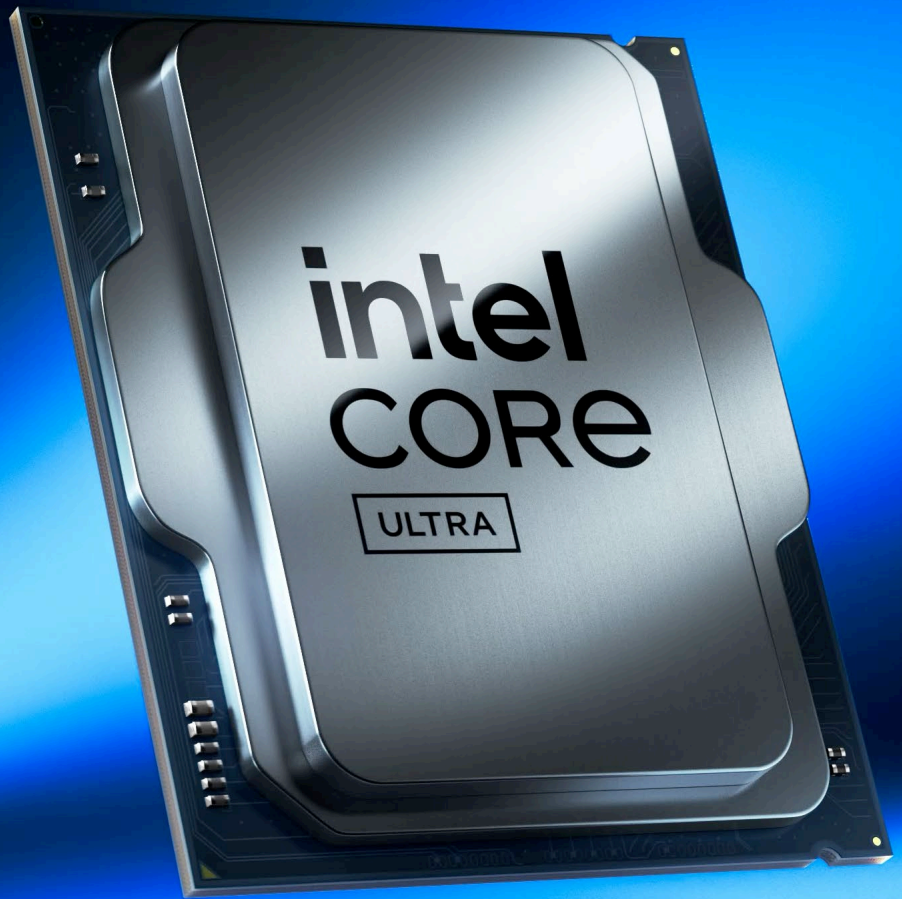
## Roger Chandler

Vice President,  
Client Computing Group  
General Manager,  
Enthusiast PC & Workstations

## Robert Hallock

Vice President,  
Client Computing Group  
General Manager,  
AI & Technical Marketing





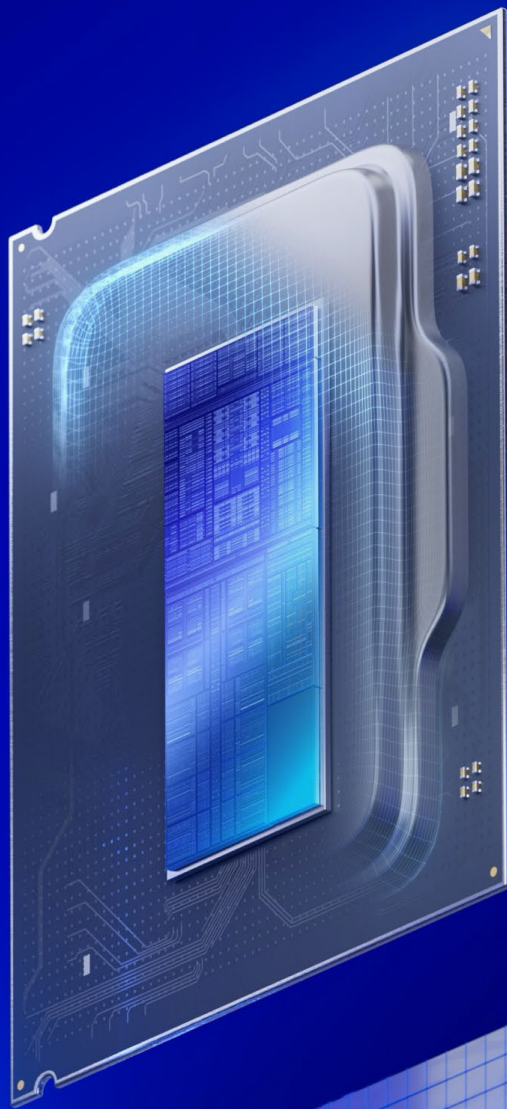
INTRODUCING

# Intel<sup>®</sup> Core<sup>™</sup> Ultra Processors

200S SERIES

# Arrow Lake

## Program Goals



Performance  
per Watt

Reduce  
package  
power by  
~40%

Deliver >15%  
generational  
multithreaded  
performance

...while  
maintaining  
gaming  
performance

User  
Experience

Expand AI  
acceleration  
to enthusiast

Integrate Xe-  
LPG for latest  
media support

Reduce  
package  
temps ~10°C  
while gaming

Arrow Lake

# The Cooler and More Efficient Gaming CPU

## Same performance at half the power of Raptor Lake-R

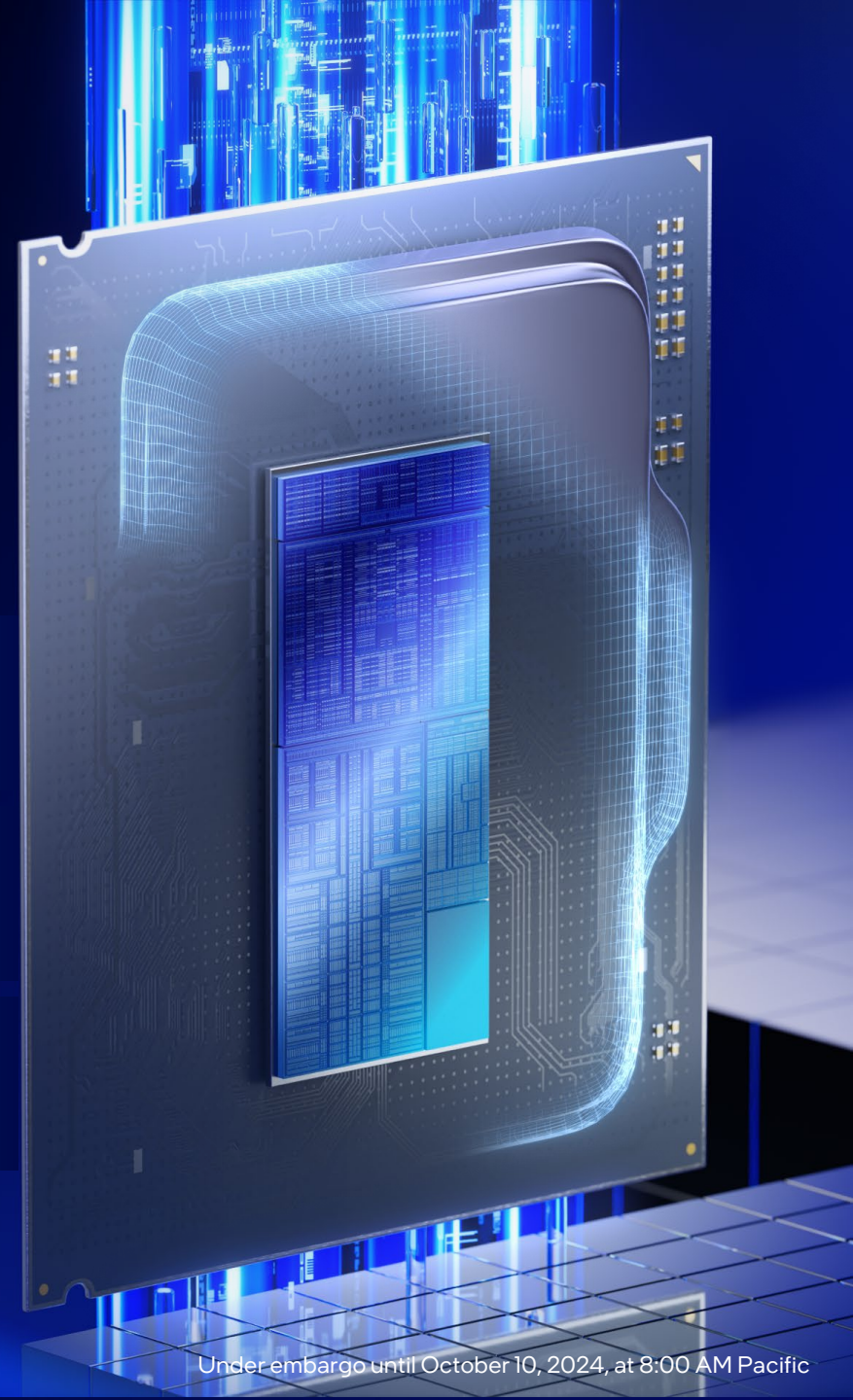
Skymont, Lion Cove, and Foveros team up for impressive perf/W gains

## Highest multithread performance

Up to 24 cores for industry-leading compute throughput on desktop PCs<sup>1</sup>

## Feature-rich enthusiast experience

Xe-LPG for new codecs; ~36 TOPS for desktop AI PC; integrated Thunderbolt™ 4



<sup>1</sup> As of October 2024, among desktop processors targeting ~125W TDP. For more information, go to [intel.com/performanceindex](https://intel.com/performanceindex). Results may vary.

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# 32%

IPC uplift over previous gen (vs. Gracemont)

# 2x

L2 cache bandwidth

## Skymont E-core

E-core efficiency meets P-core performance

## Lion Cove P-core

The fastest performance core for desktop PCs

Up to **36MB** shared LLC

# 9%

IPC uplift over previous gen (vs. Raptor Cove)



### Scalable & flexible

across multiple implementations



### Deeper queueing

for better parallelism



### AI-based power management



### Split out of order engine

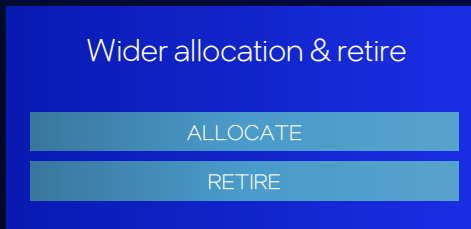


# 2x

**AI throughput**  
from 4x 128-bit FP & SIMD vector

### Enhanced prediction

to find instructions faster



# 4MB

shared L2 cache

# 16.67MHz

Finer clock intervals

# 8x

Wider predict

Wider scheduling

ALLOCATE / RENAME / MOVE ELIMINATION / ZERO IDIOM (8-WIDE)

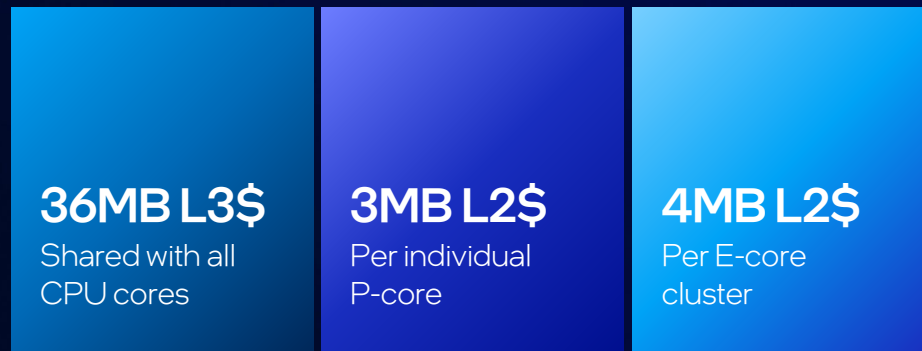
48KB L0 D-CACHE  
192KB L1 D-CACHE  
UP TO 3MB L2 CACHE

### Enhanced memory subsystem

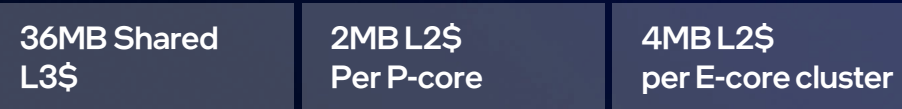
with 3MB L2 Cache

# Bringing L3\$ to Skymont

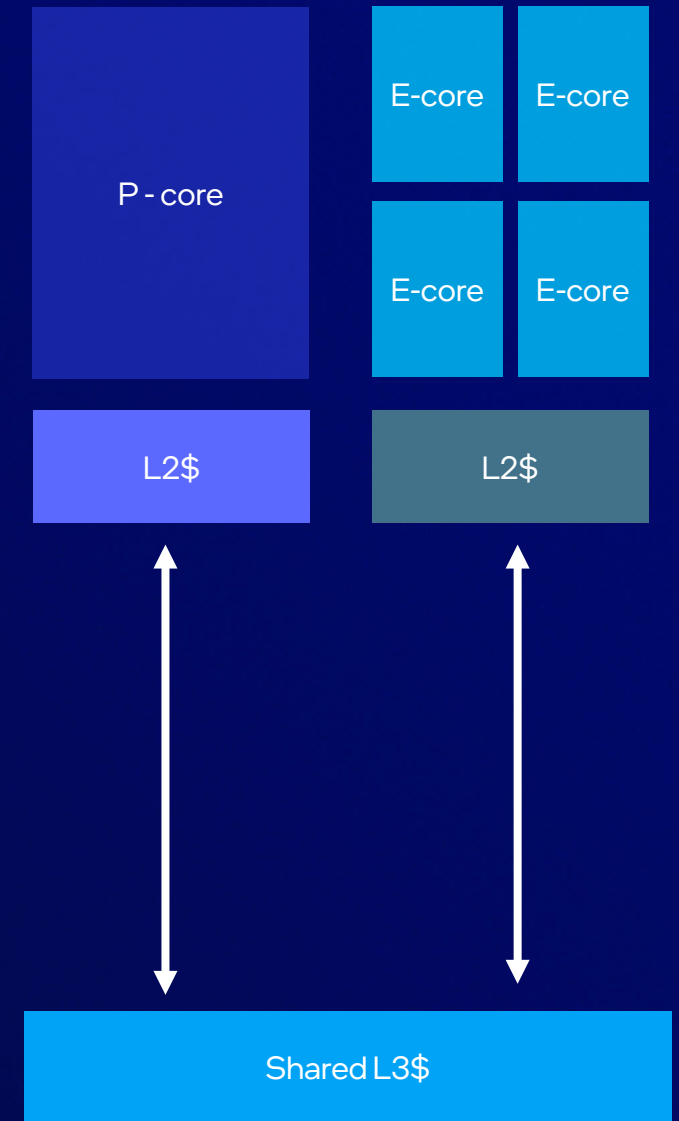
Intel® Core™ Ultra 200S Series processors cache hierarchy



Raptor Lake-R Configuration



### Compute Tile Floorplan

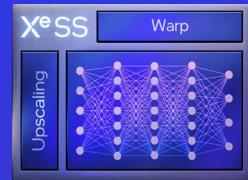


Intel Core Ultra 200S

# Xe GPU

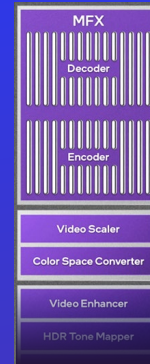
Built with Xe-LPG graphics architecture

XeSS support



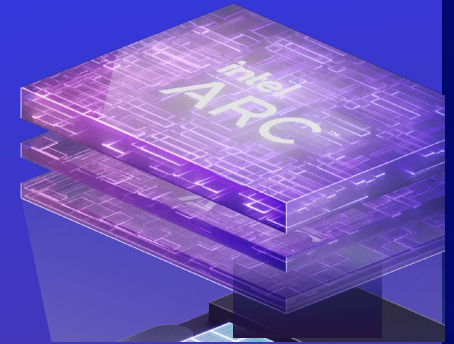
## Xe Media Engine

Encode/decode



## intel ARC™

Software stack



## 4 Xe-cores

Xe core

XVE	XVE
XVE	XVE
XVE	XVE
XVE	XVE
XVE	XVE
XVE	XVE

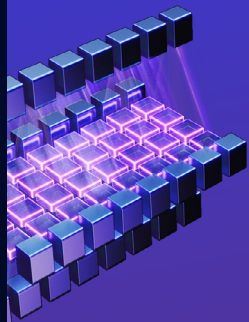
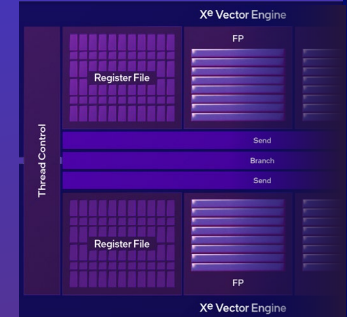
Full support for

DirectX

# XIII ULTIMATE



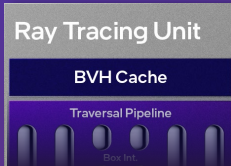
## Xe vector engines



# DP4a

AI acceleration instructions

## 4 Ray tracing Units



# Up to 8 TOPS

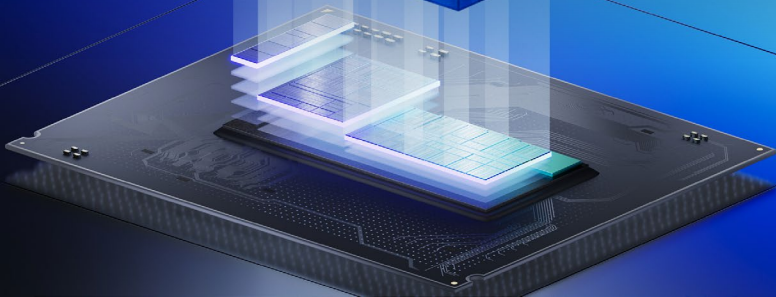
## 4MB L2 cache



# AI Sized to Balance with Enthusiast Configurations

Intel Core Ultra 200S Series

Up to **36** platform TOPS



**GPU**

Up to **8** int8 TOPS

**Xe**

DP4a Instructions

Compact tile assumes discrete GPU

Intel's 1<sup>st</sup> for enthusiasts

**NPU**

Up to **13** int8 TOPS

**NPU3**

MAC Arrays

Sized for agents, media, and SLMs

**CPU**

Up to **15** int8 TOPS

**Skymont Lion Cove**

AVX - VNNI

Always available and low latency

+

Intel® Arc™ A770 Example



**dGPU**

Up to **260** int8 TOPS\*

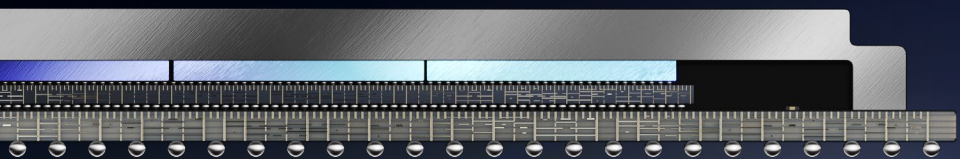
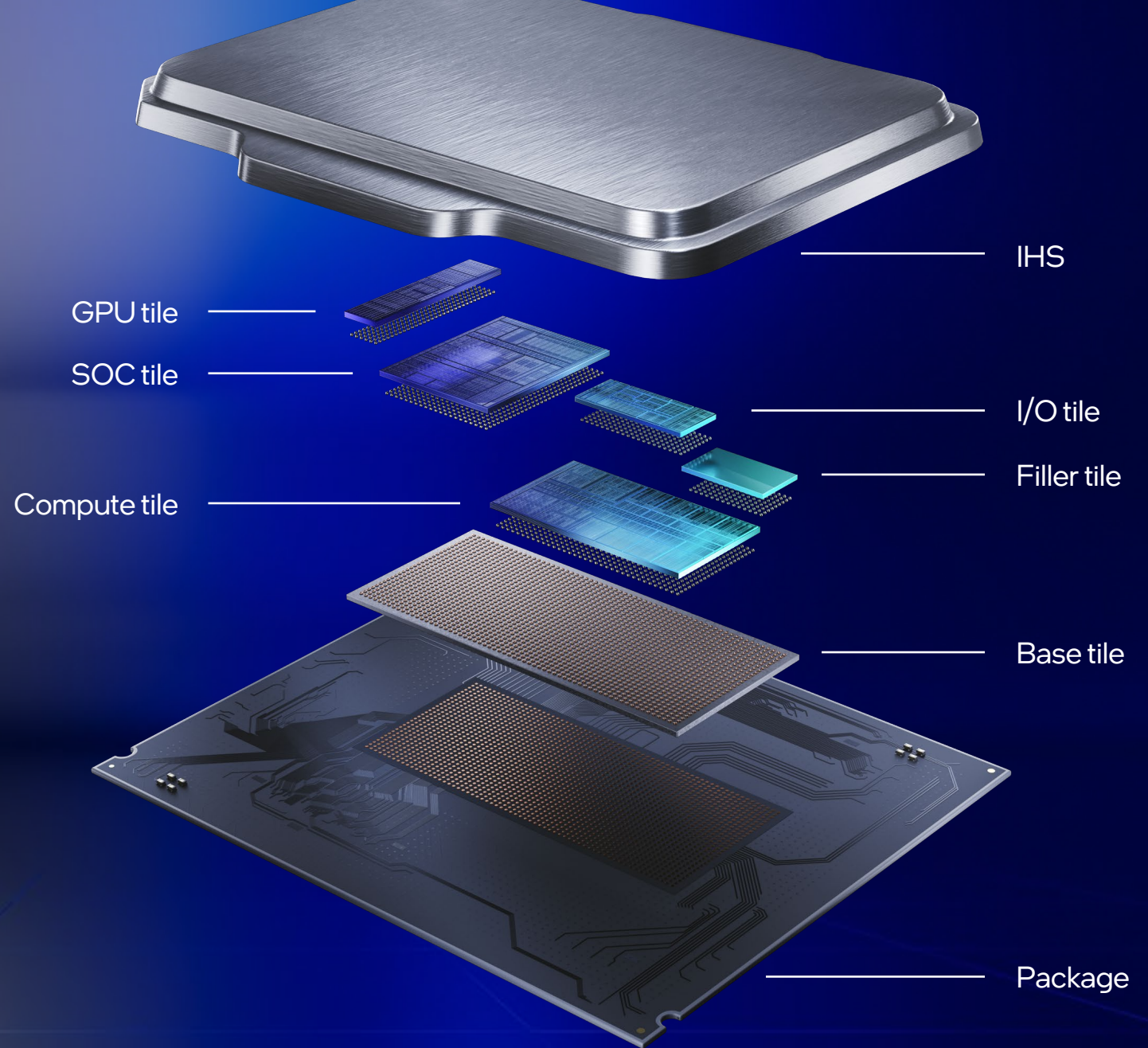
**Xe**

XMN Instructions

Game AI, agents, creation, and more

# Scaling Skymont and Lion Cove to Gaming PCs

Enabled by Foveros Advanced 3D packaging technology



# Intel® Core™ Ultra 200S Series

All-new architecture for high-performance desktops



Intel® Core™ <b>Ultra 9 285K</b>	<b>24</b> Cores (8P+16E)	<b>24</b> Total threads	<b>4</b> GPU cores	<b>13</b> TOPS NPU	<b>5.7</b> Max GHz
Intel® Core™ <b>Ultra 7 265K</b>	<b>20</b> Cores (8P+12E)	<b>20</b> Total threads	<b>4</b> GPU cores	<b>13</b> TOPS NPU	<b>5.5</b> Max GHz
Intel® Core™ <b>Ultra 7 265KF</b>	<b>20</b> Cores (8P+12E)	<b>20</b> Total threads	- GPU cores	<b>13</b> TOPS NPU	<b>5.5</b> Max GHz
Intel® Core™ <b>Ultra 5 245K</b>	<b>14</b> Cores (6P+8E)	<b>14</b> Total threads	<b>4</b> GPU cores	<b>13</b> TOPS NPU	<b>5.2</b> Max GHz
Intel® Core™ <b>Ultra 5 245KF</b>	<b>14</b> Cores (6P+8E)	<b>14</b> Total threads	- GPU cores	<b>13</b> TOPS NPU	<b>5.2</b> Max GHz



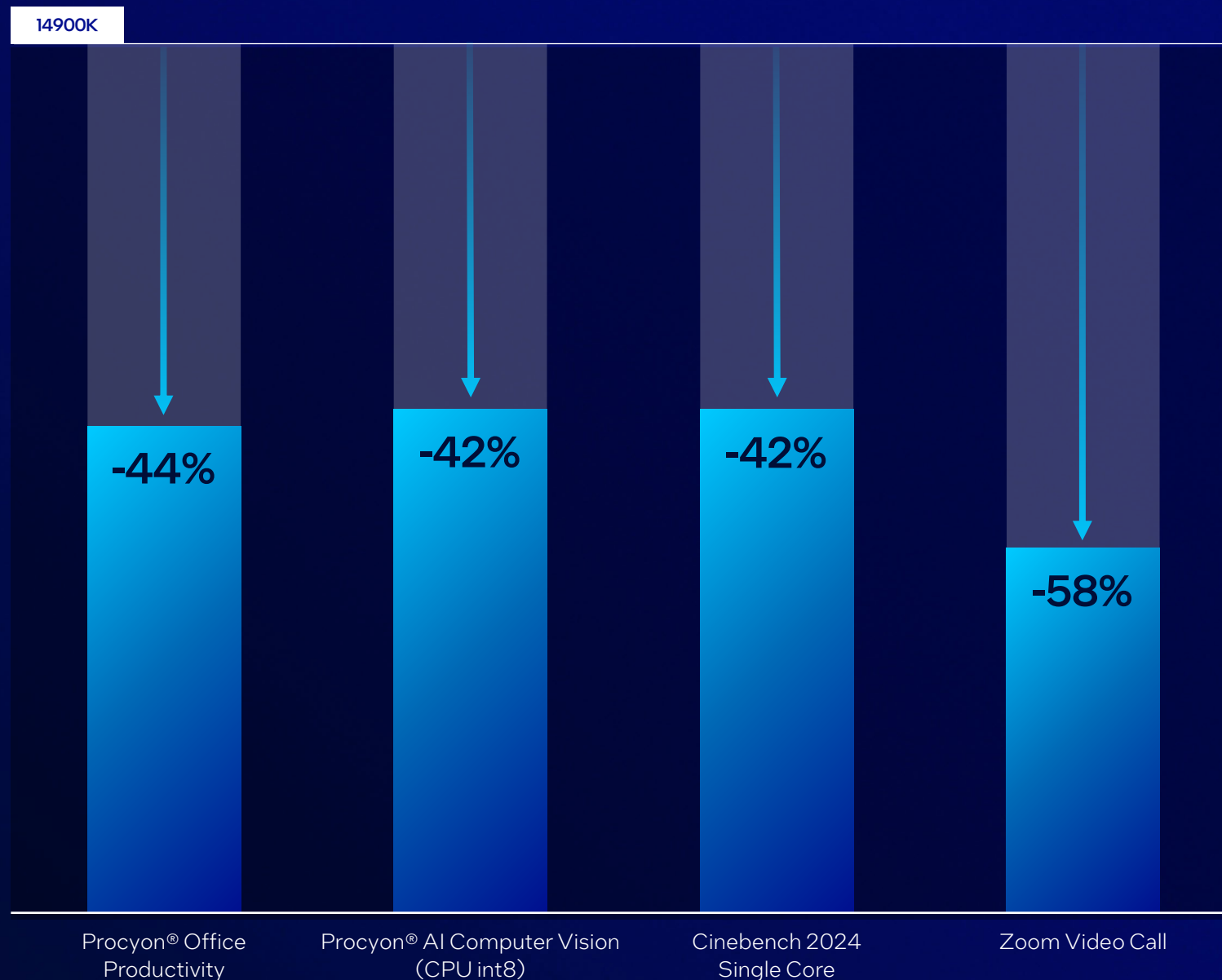
A **Landmark**  
Reduction in Power

**Leadership**  
Core Performance

# Arrow Lake Halves Productivity Power Consumption

Up to **58%** lower package power  
in lightly-threaded work  
compared to Raptor Lake-R

Intel® Core™ Ultra 9 285K



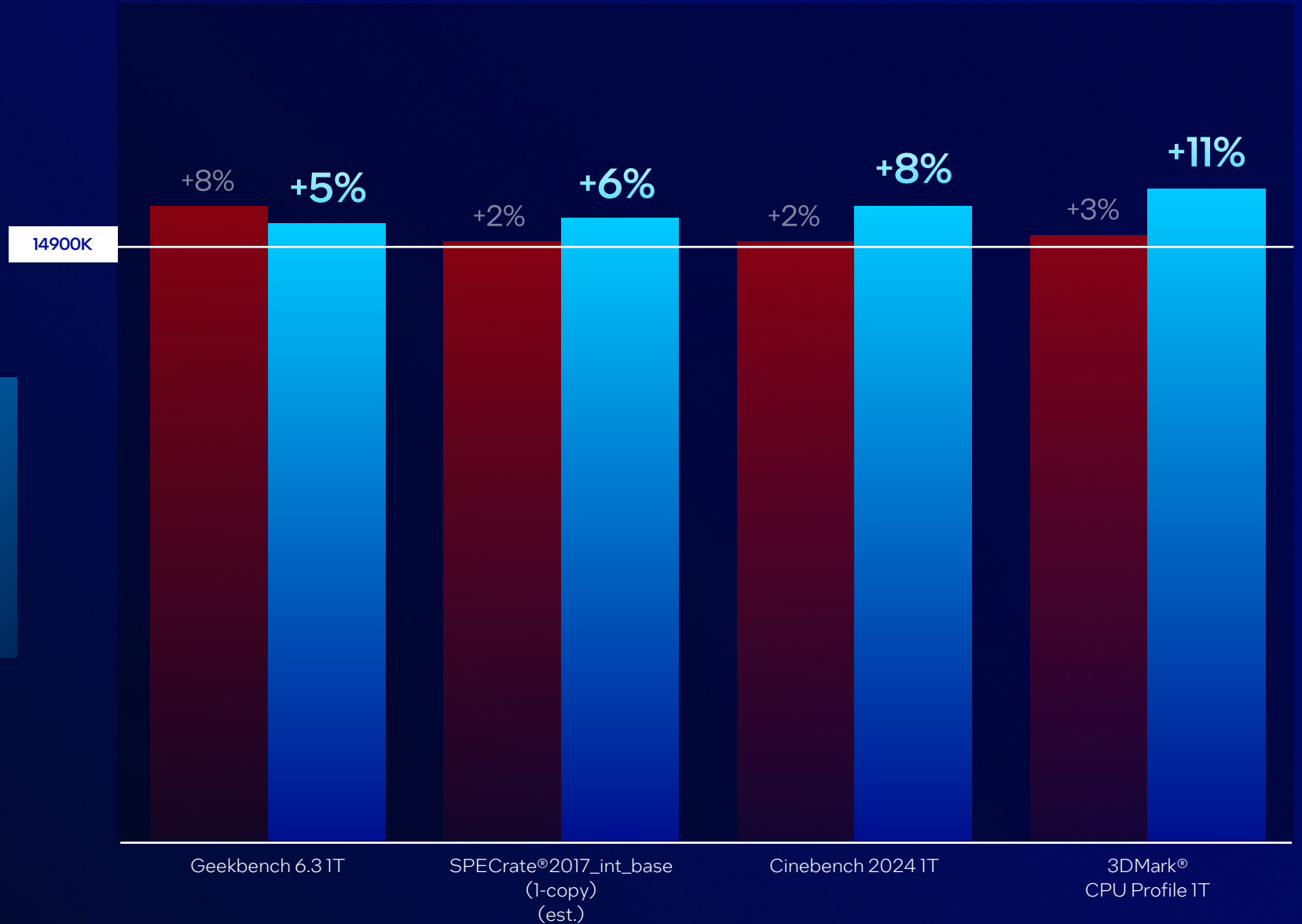
Comparison of Intel Core Ultra 200S series processors against prior generation enthusiast desktop processors targeting ~125W TDP, based on average CPU package (SoC) power measured in watts across measured benchmarks and representative workloads. Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://intel.com/performanceindex) for details.

# Leadership Core Performance

Geomean  
**~8% faster**  
IT performance  
vs. prior gen

Geomean  
**~4% faster**  
IT performance  
vs. competition

Intel® Core™ Ultra 9 285K  
AMD 9950X

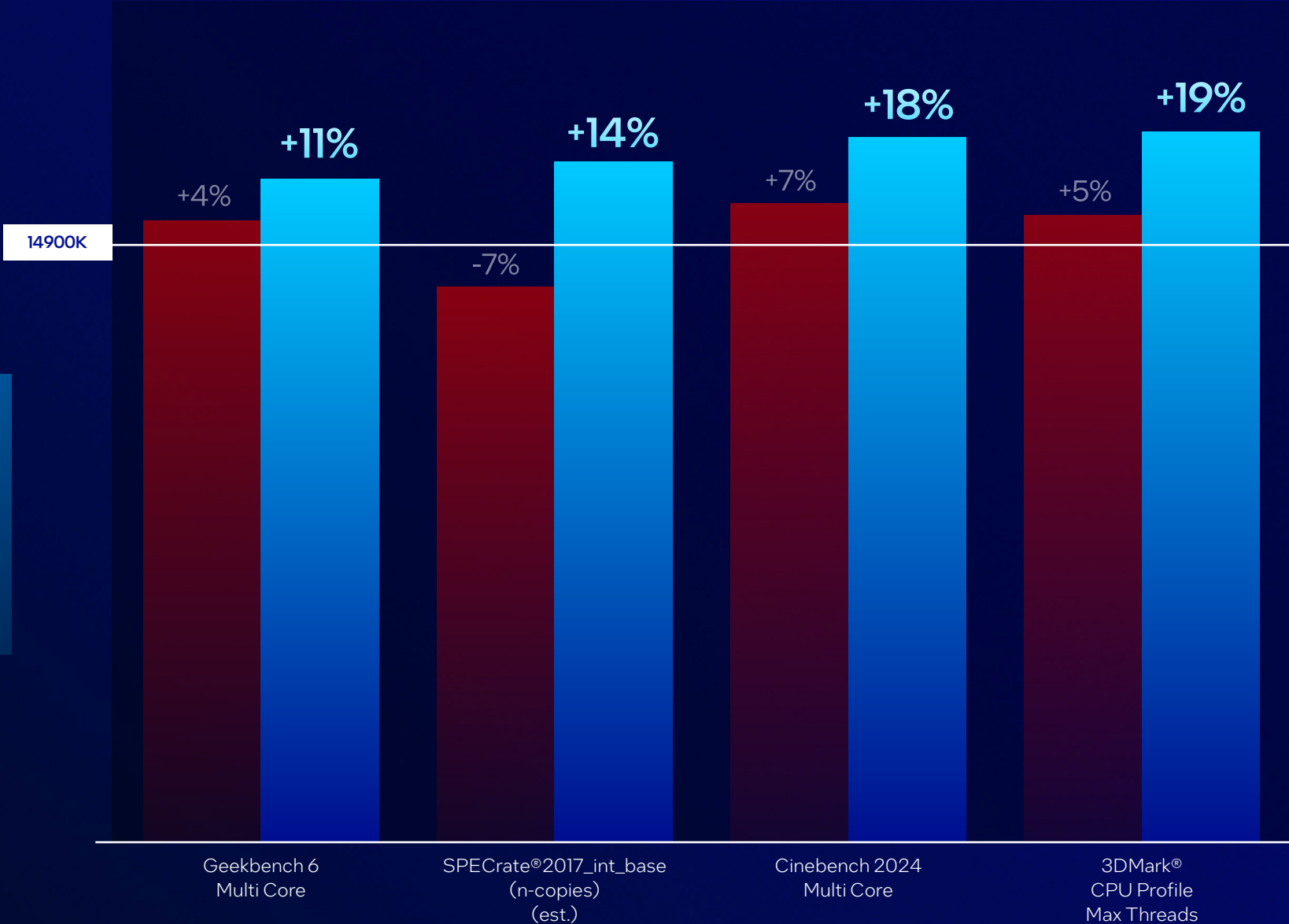


Relative performance (higher is better)

# Arrow Lake Sets the Bar for CPU Compute

Geomean  
**15% faster**  
nT performance  
vs. prior gen

Geomean  
**13% faster**  
nT performance  
vs. competition



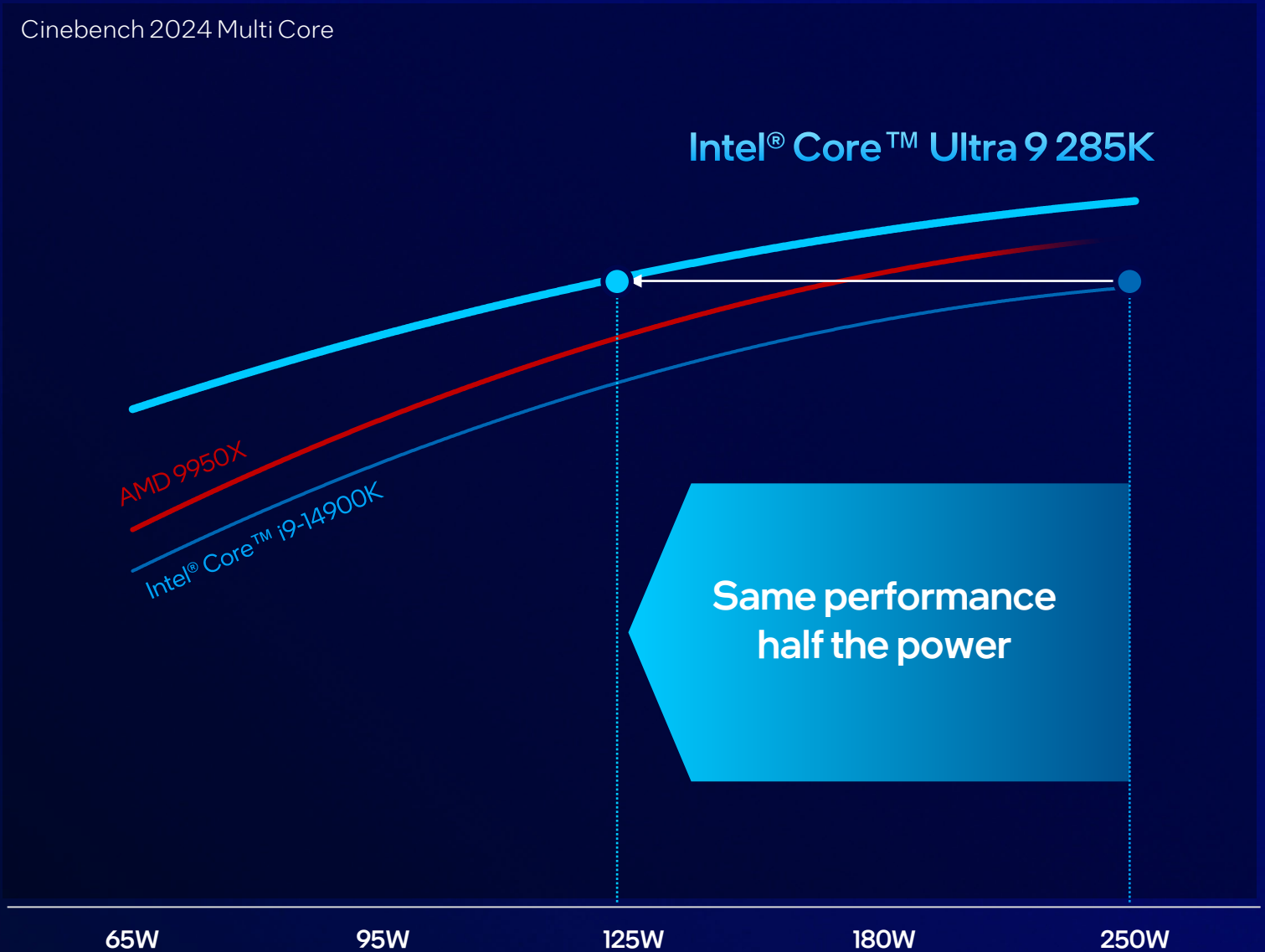
Intel Core Ultra 9 285K (24 Threads)

AMD 9950X (32 Threads)

Relative performance (higher is better)

# Energy Efficiency Leadership From Low to High

Leadership performance per watt in multithreaded CPU compute



As of October 2024, among desktop processors targeting ~125W TDP. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details. Results may vary.

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# Arrow Lake Delivers Exceptional Energy Efficiency

Perf

**Leadership CPU  
Core Performance**

in enthusiast desktop

Up to

**19% more nT perf**

vs. previous gen

Power

Up to

**58% lower  
package power**

in lightly-threaded use cases

Up to

**Same performance  
at ½ the power**

in sustained nT vs. previous gen

As of October 2024, among desktop processors targeting ~125W TDP; SPECrate<sup>®</sup>2017\_int\_base (1-copy) performance is estimated. See [intel.com/performanceindex](https://intel.com/performanceindex) for details. Results may vary.

intel.

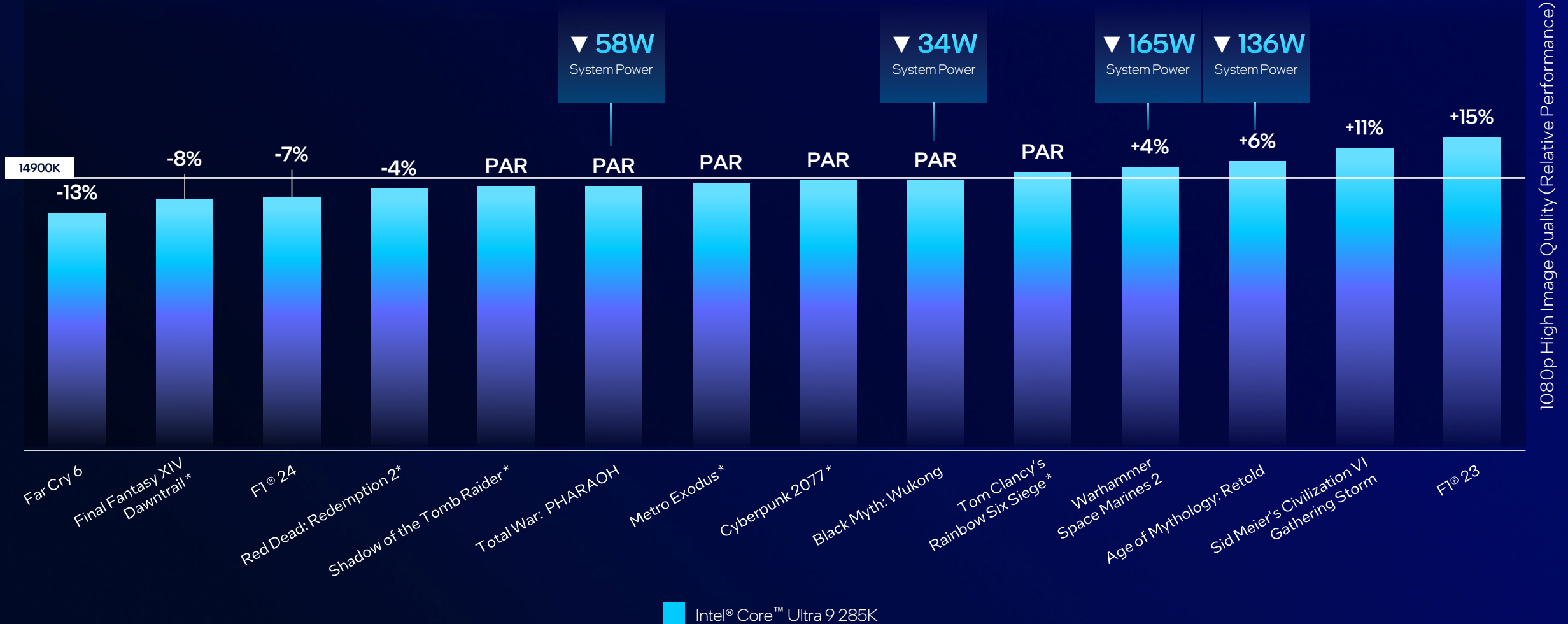
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# Elite Gaming Experience



# One Giant Leap in Gaming Perf/W

Same framerates as Raptor Lake-R at up to **~165W** lower system power

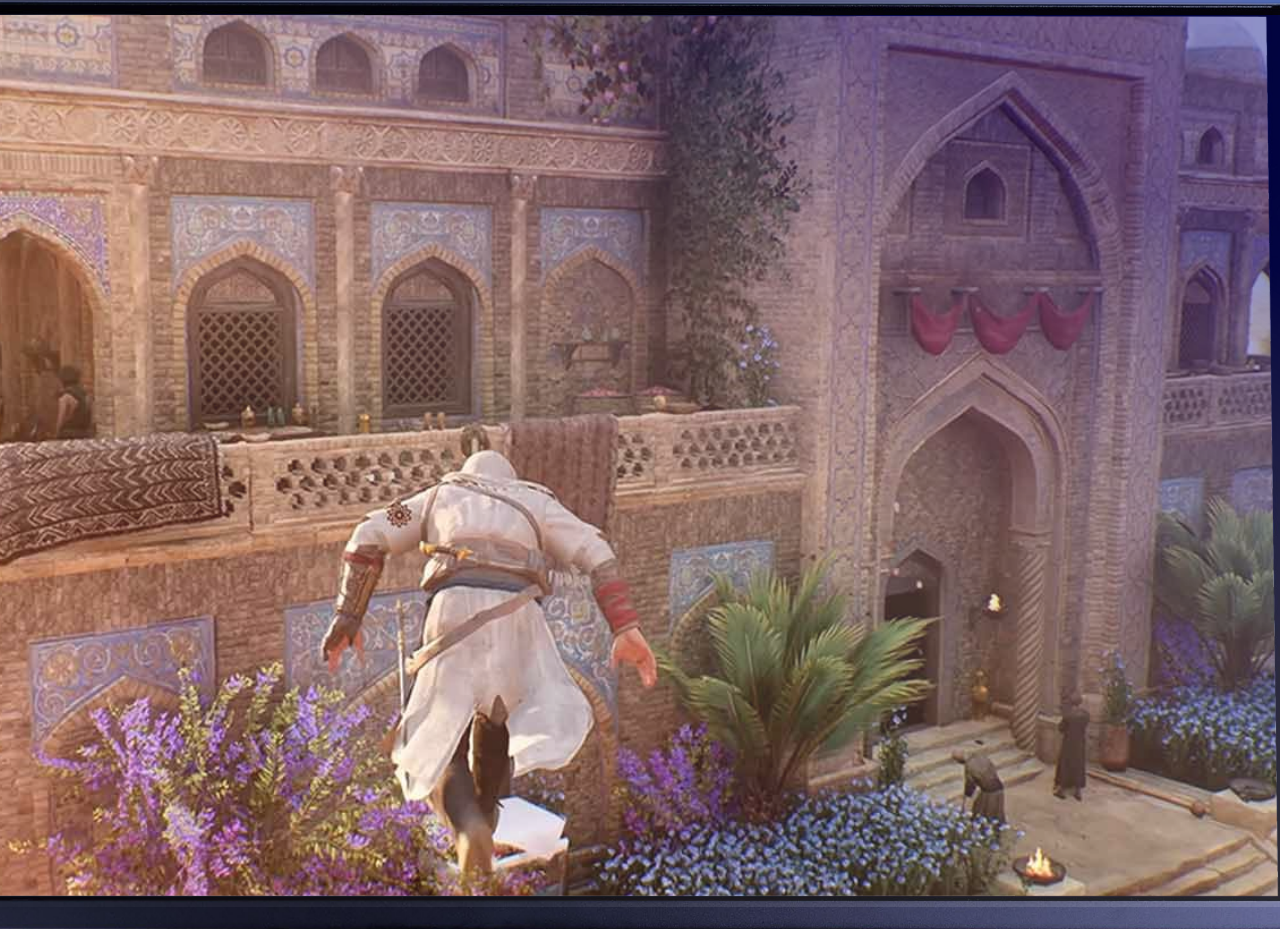


1080p High Image Quality (Relative Performance)



\*Intel APO enabled. On par is +/-3%. See [intel.com/performanceindex](https://intel.com/performanceindex) for details. Results may vary.

Intel® Core™ Ultra 9 285K



ASSASSIN'S  
CREED  
MIRAGE

DEMO

Intel® Core™ i9-14900K

Intel® Core™ Ultra 9 285K

~264 FPS



**PAR**

Average FPS



~261 FPS

~527 W

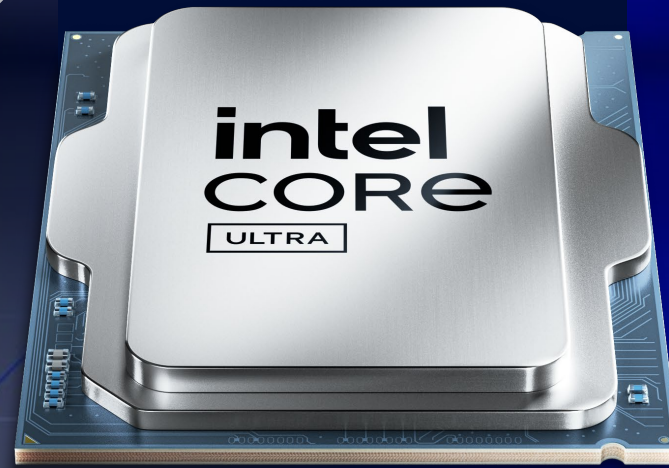


**↓ 80W**

System power



~447 W



Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details.

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# Arrow Lake Slashes Gaming Power

Up to **~165W** lower total system power than Raptor Lake-R under same conditions



Intel® Core™ Ultra 9 285K

Intel® Core™ i9-14900K (baseline)

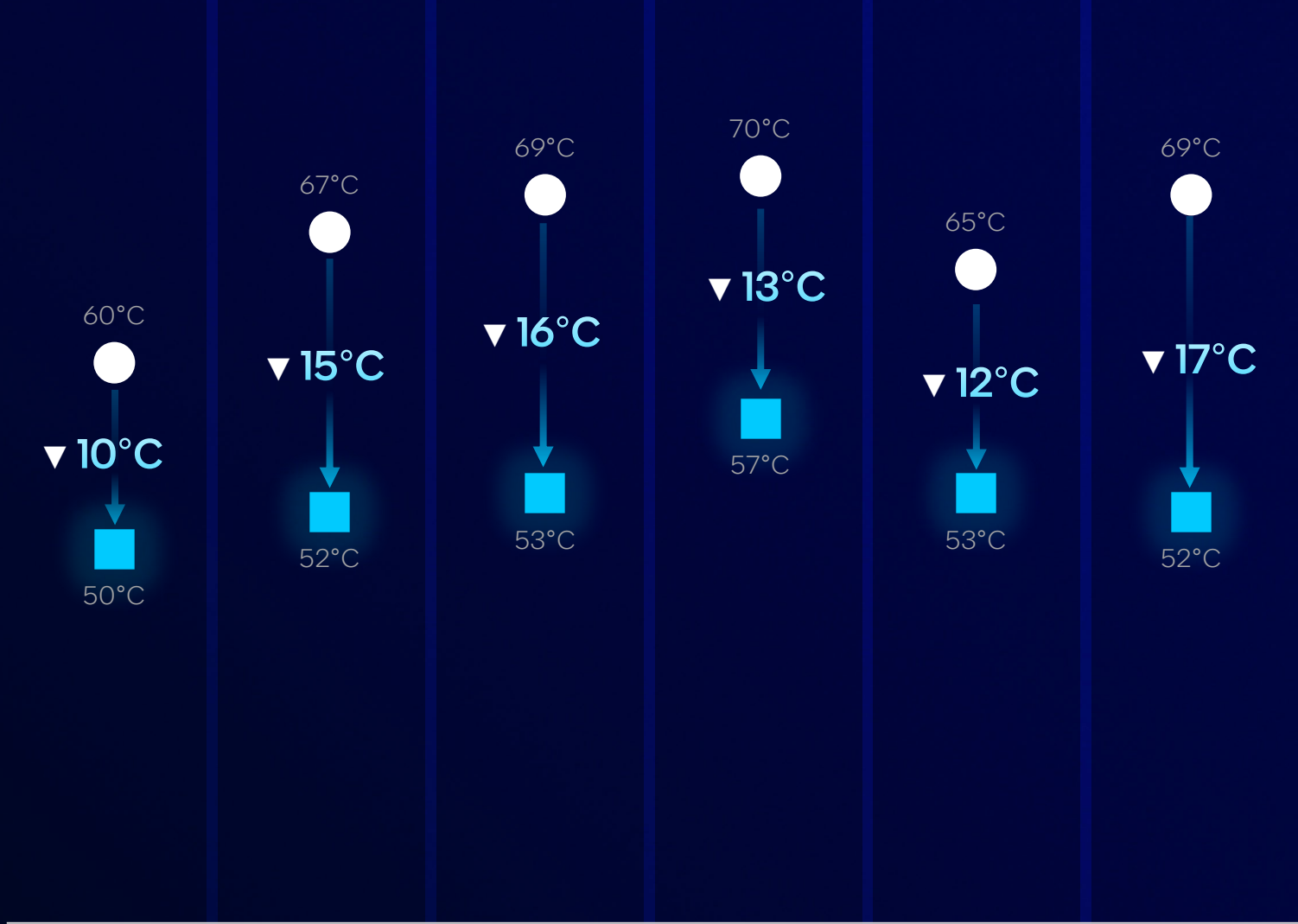
# Cooler and Quieter Gaming with Arrow Lake

Averaging ~13°C cooler package temps vs. Raptor Lake-R

Average CPU Package Temp, 1080p Gaming, 360mm AIO Cooler

■ Intel® Core™ Ultra 9 285K

● Intel® Core™ i9-14900K



Average CPU package temp

Final Fantasy XIV: Dawntrail

F1® 24

Total War: PHARAOH

Assassin's Creed: Mirage

Call of Duty: Modern Warfare III

Tom Clancy's Rainbow Six Siege



Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details.

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# Battle of the Titans

Gamers win when competition is fierce



1080p High Image Quality (Relative Performance)

Intel® Core™ Ultra 9 285K

intel. \*Intel APO enabled. On par is +/-3%. See [intel.com/performanceindex](https://intel.com/performanceindex) for details. Results may vary.

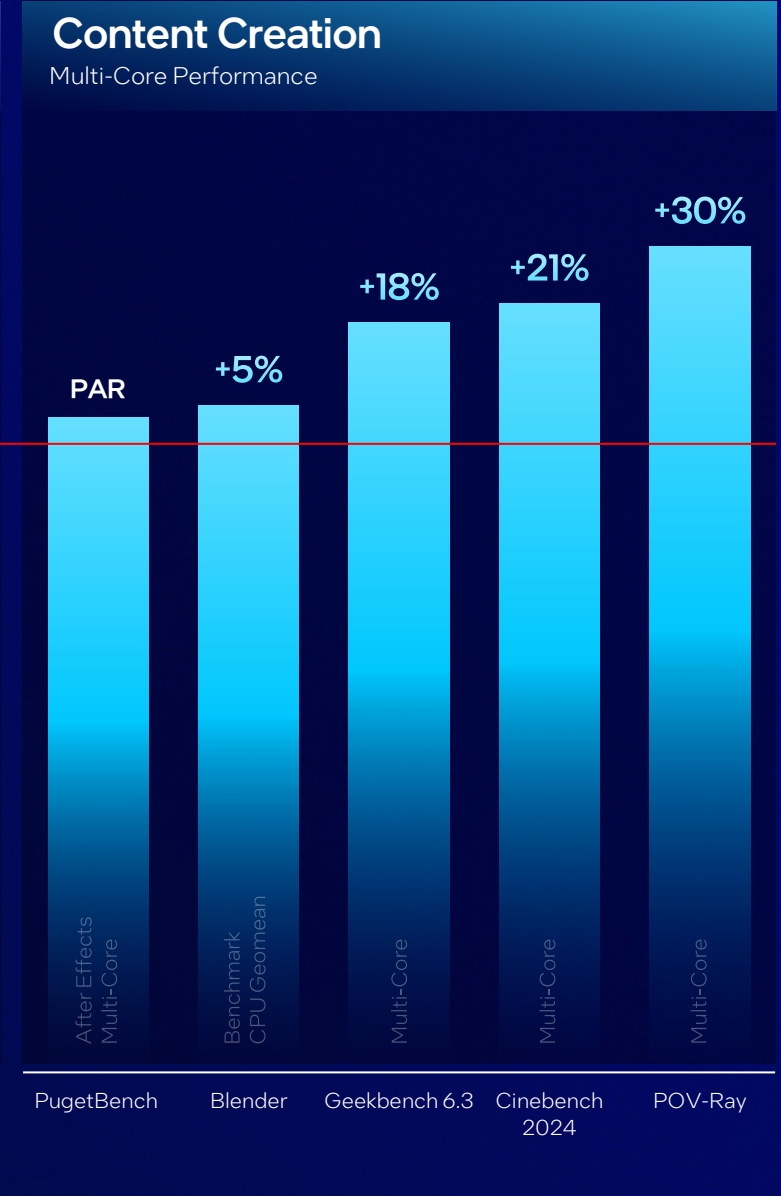
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# A Balanced Enthusiast Experience

Strong gaming and superior content creation in one package

Intel® Core™ Ultra 9 285K

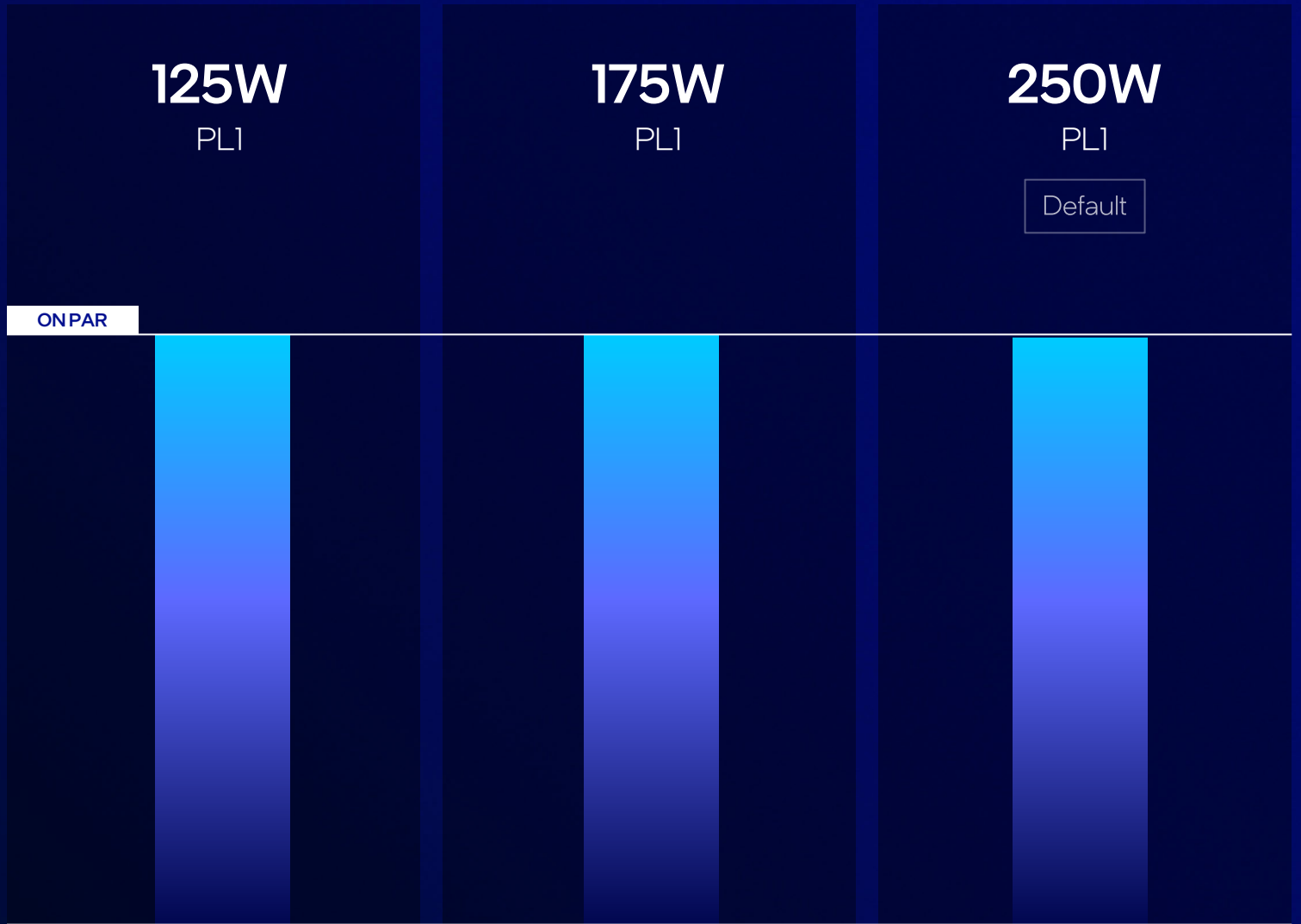


# Arrow Lake Perf/W Delivers **Awesome** **Scaling** for Efficient Gaming

Consistent performance when  
tuned for compact gaming PCs

#### 7 Titles Represented

Assassin's Creed: Mirage  
Call of Duty: Modern Warfare III  
F1® 24  
Red Dead Redemption 2  
Tom Clancy's Rainbow Six Siege  
Total War: PHARAOH  
Age of Mythology: Retold



Intel® Core™ Ultra 9 285K

Relative performance, geomean of 6 titles @ 1080p High

# A Cooler and Quieter Flagship Experience

Intel® Core™ Ultra 7 265K  
vs. Intel® Core™ i9-14900K



Geomean  
**-5%**  
gaming perf

Geomean  
**15°C**  
lower temp

Up to  
**188W**  
lower system  
power



Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details.

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# Gaming Elevated.

**The complete package**  
for PC enthusiasts

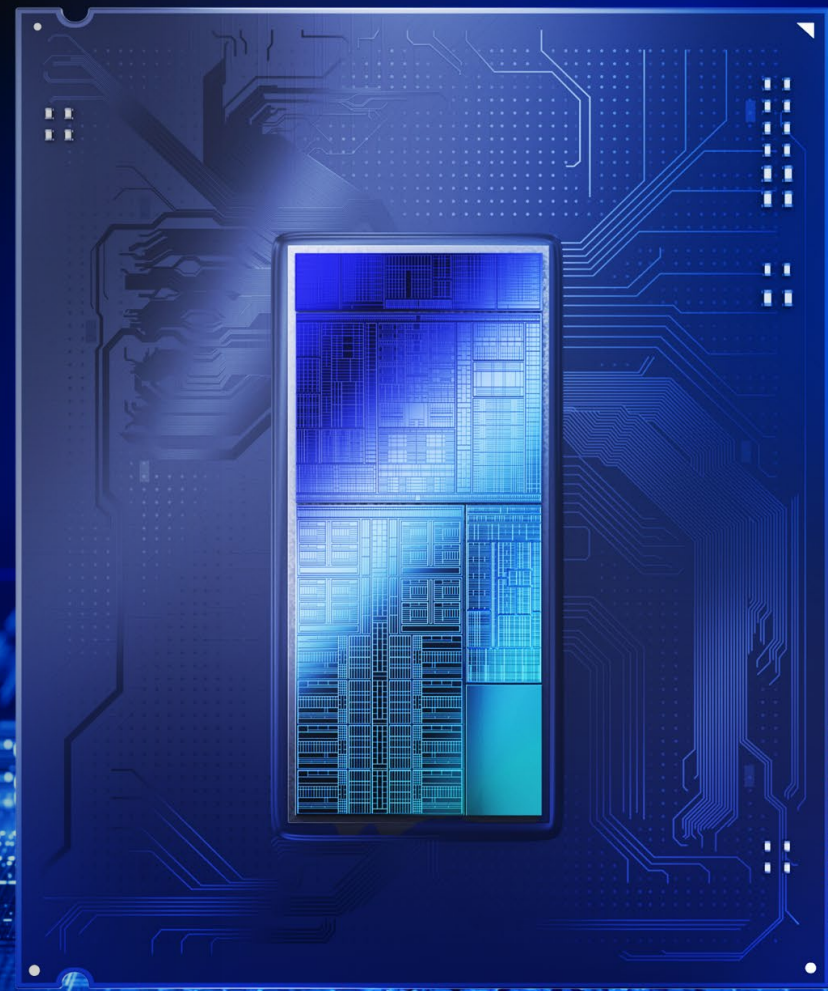
intel  
CORE  
ULTRA 9

**Core i9 performance** at up to 188W  
lower system power while gaming

intel  
CORE  
ULTRA 7

**Essential performance**  
for pure gaming rigs

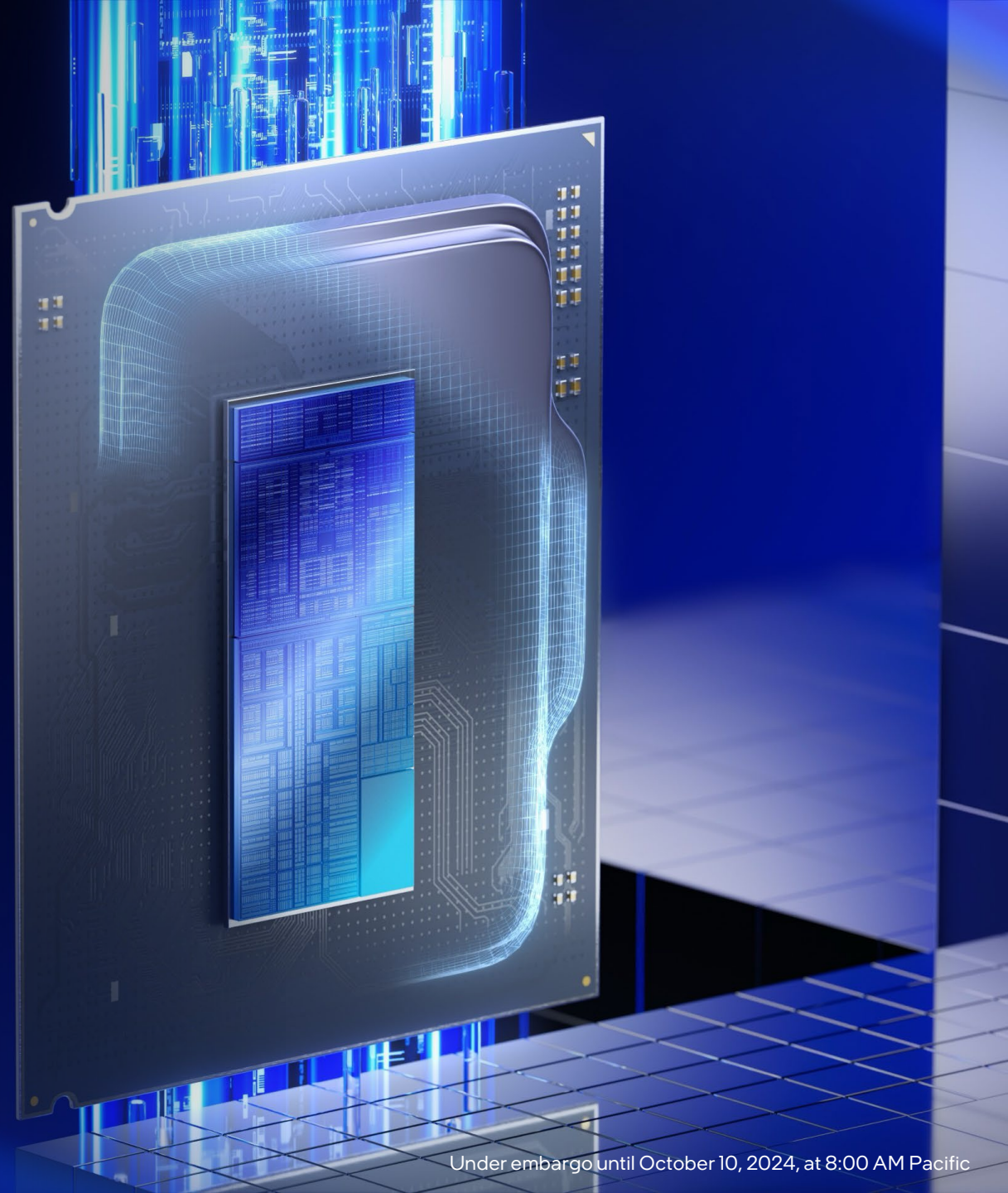
intel  
CORE  
ULTRA 5



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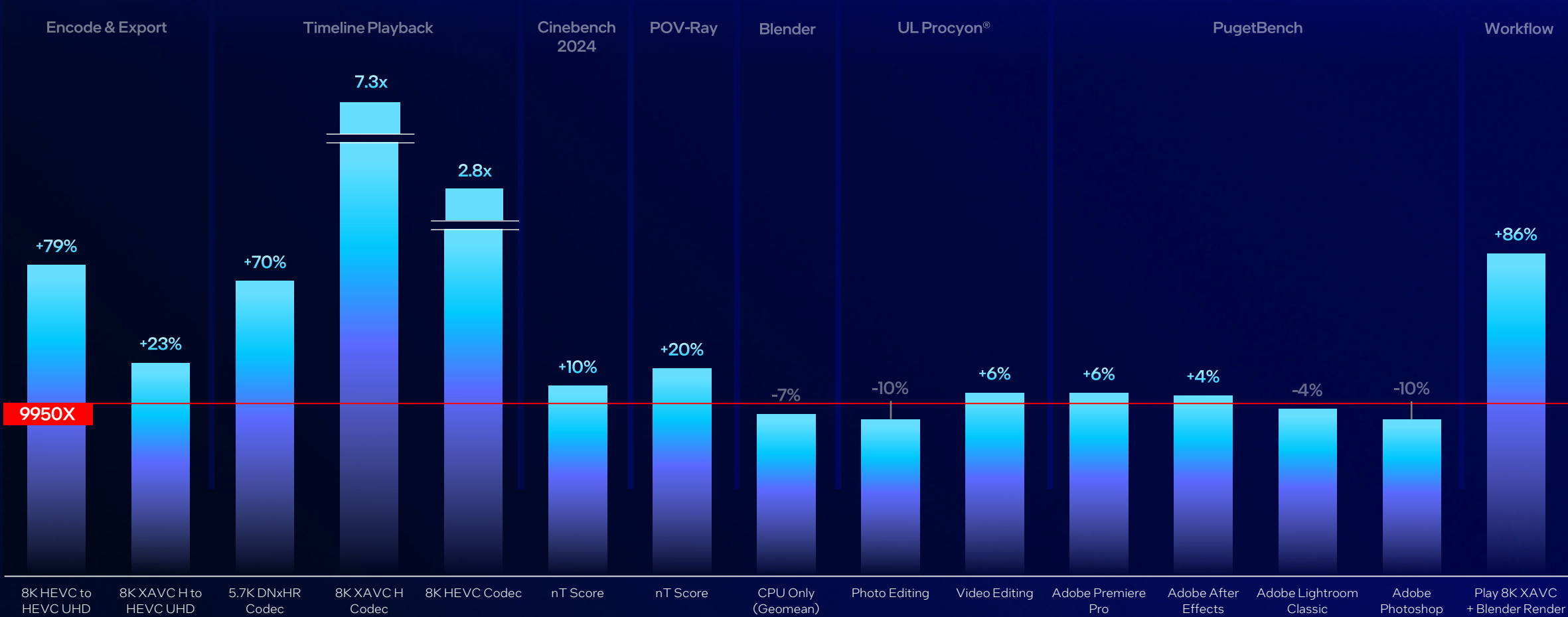
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# Powerhouse Creation and AI



# Top-Tier Performance for Creators

Faster render times and hardware support for professional codecs



Intel® Core™ Ultra 9 285K



As of October, 2024 among enthusiast desktop processors targeting ~125W TDP. Results may vary. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details.

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# AI Feature Growth & Engine Adoption

## Significant ISV appetite

New perf/W to drive new features and functionality

## Rapid growth

Widespread AI integration over next 18-24 months

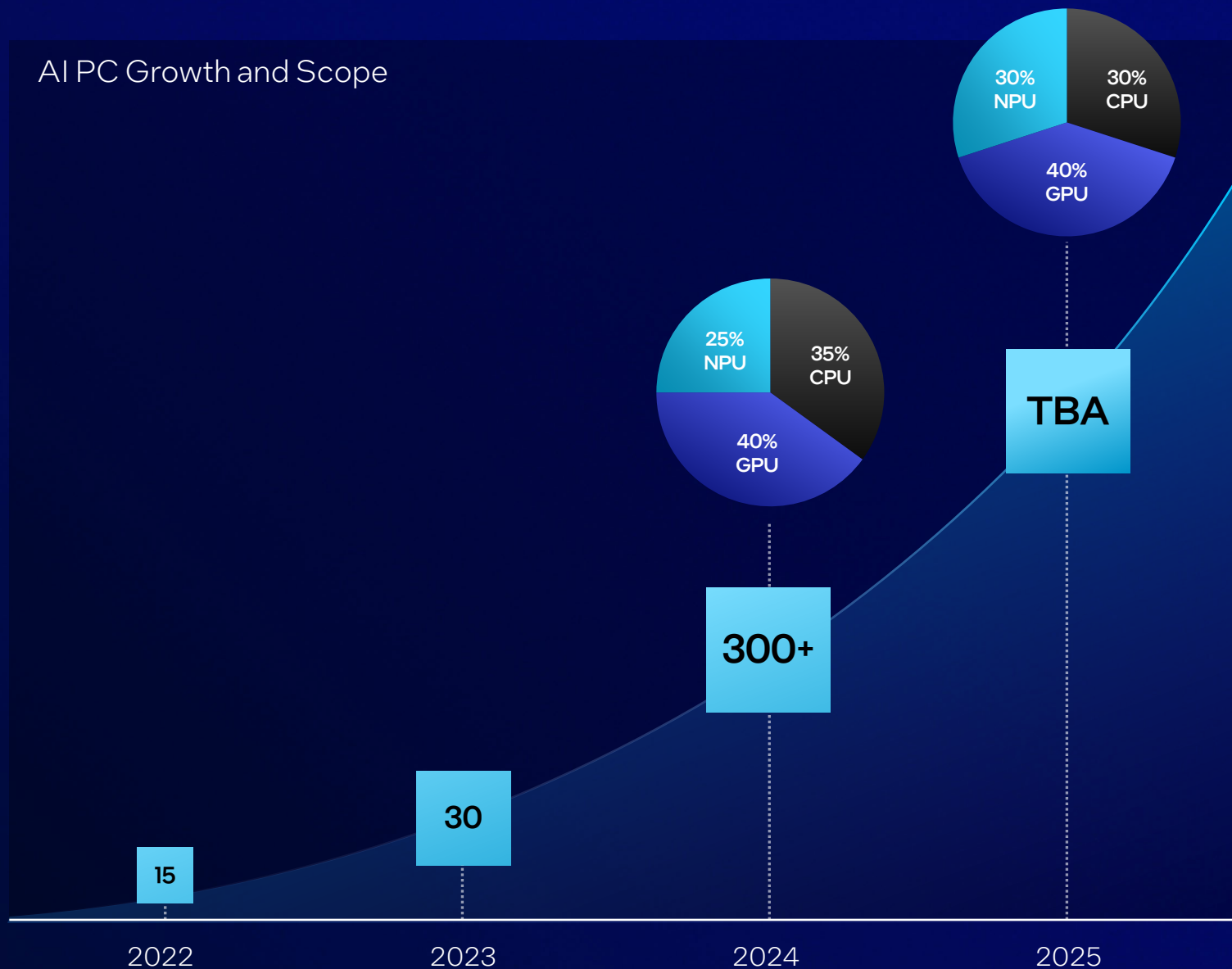
## Multi-engine roadmaps

ISVs already depend on multiple accelerators

## GPU leads in feature share

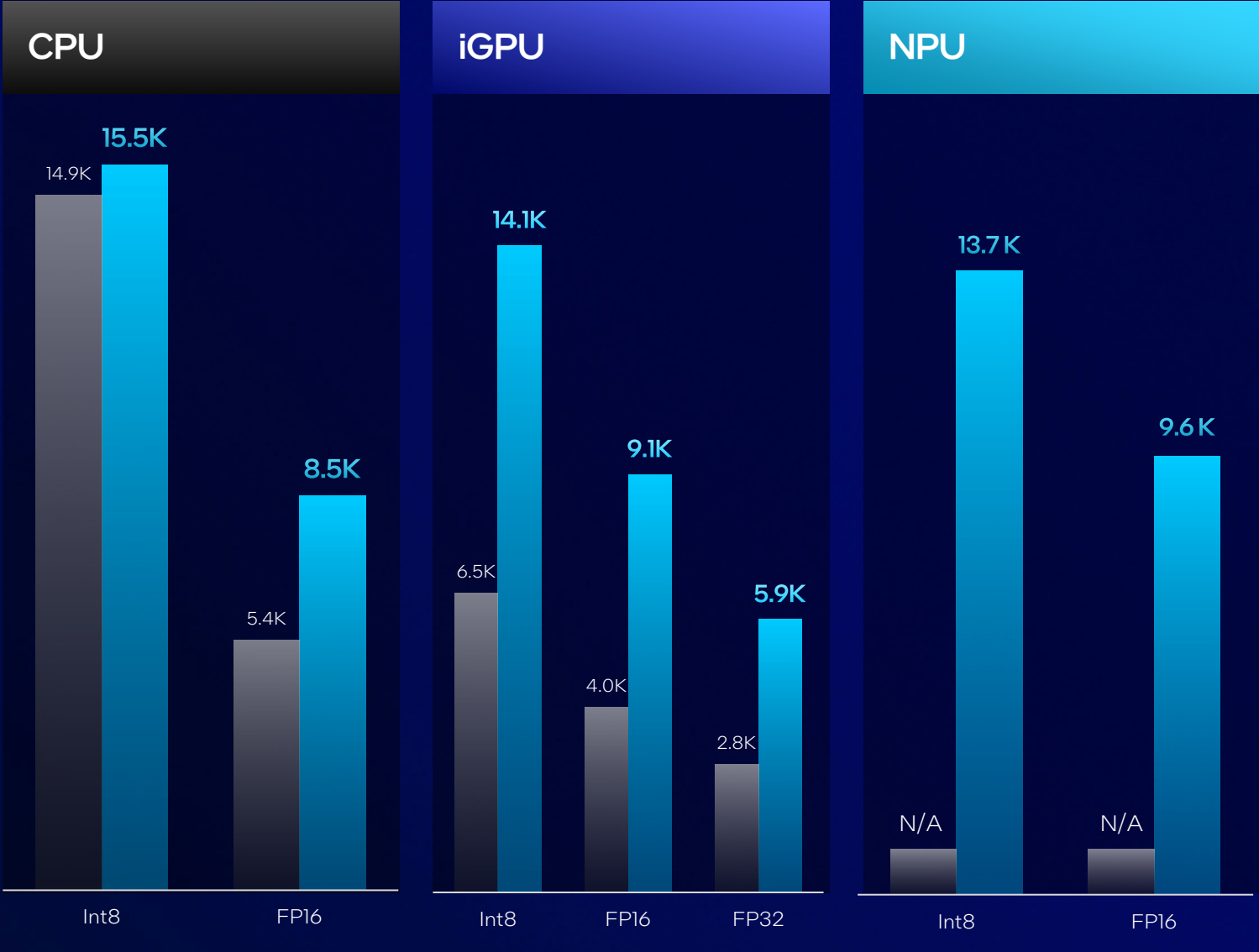
ISV roadmaps are counting on robust GPUs

AI PC Growth and Scope



# Geekbench AI Performance

Up to **~2x** the performance of Raptor Lake-R, plus NPU3 for new perf/W opportunities



■ Intel® Core™ Ultra 9 285K  
■ Intel® Core™ i9-14900K



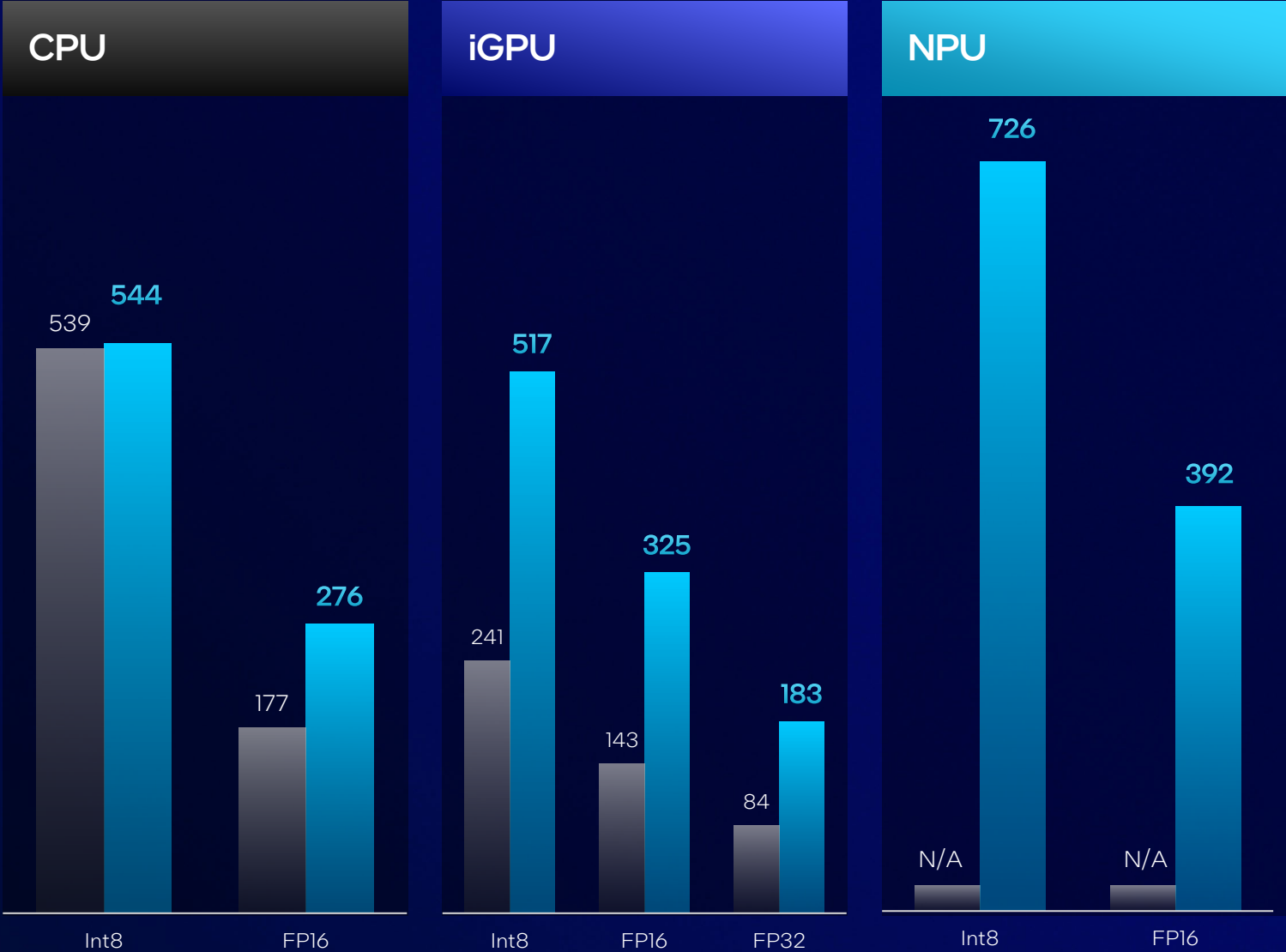
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# UL Procyon<sup>®</sup> AI Computer Vision Performance

Predictable performance on  
multiple engines, data types, and  
models



■ Intel Core™ Ultra 9 285K  
■ Intel Core™ i9-14900K

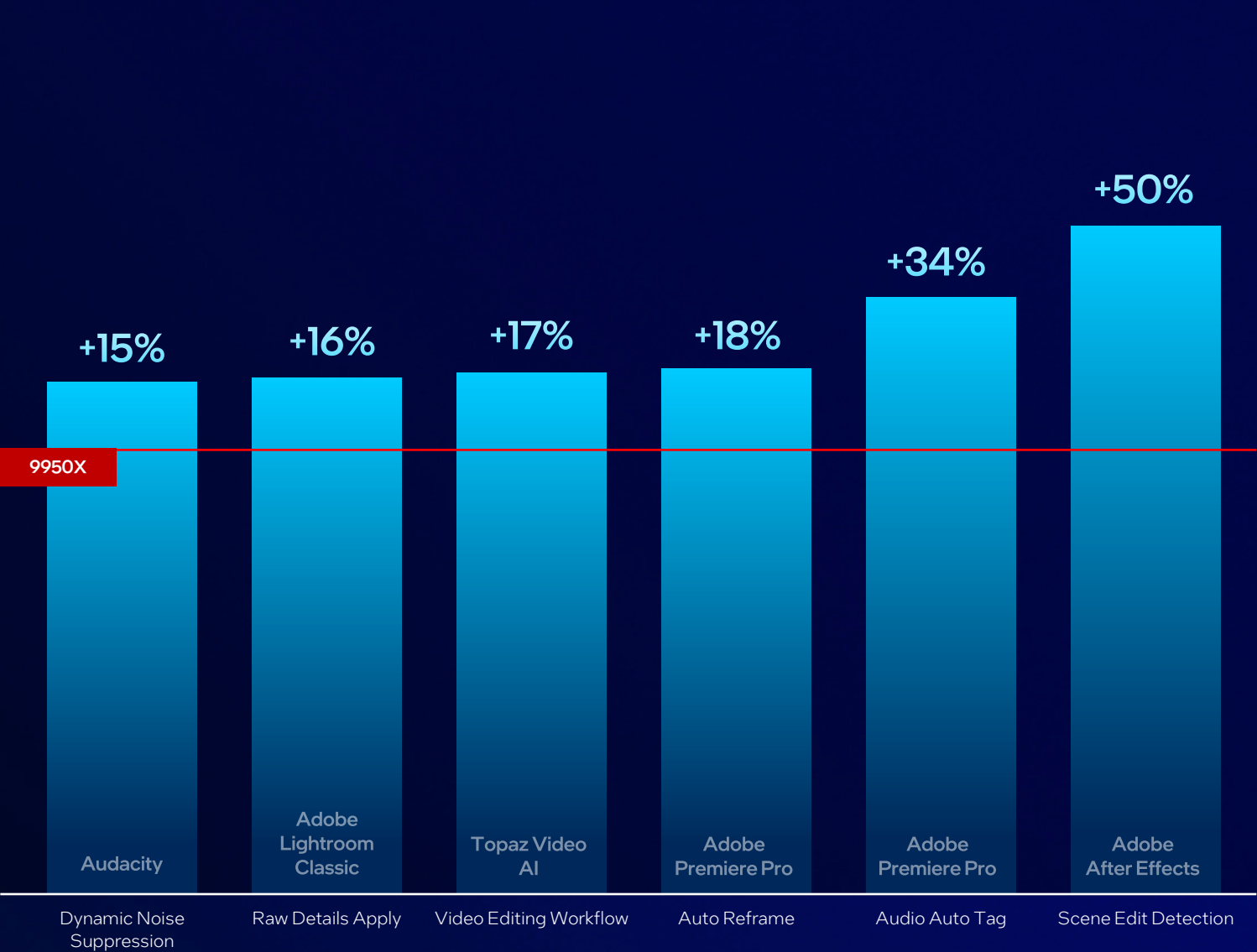


Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://intel.com/performanceindex) for details.

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# Intel AI Optimization Fuels Winning Performance

Up to **50%** faster AI performance vs. competing flagship processors



Intel Core™ Ultra 9 285K



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# Moves Digital Interaction Beyond Keyboard & Mouse



**Head**  
Motion



**Voice**  
Controls & Dictation



**Facial**  
Expressions



**Virtual**  
Buttons



**Switch**  
Control



**Tilt**  
Controls



DEMO



Computer vision to run "hotkeys" and macros with gestures & voice

Adds six new input types in games

Works with any game

OpenVINO AI Framework

CPU, GPU, and NPU support

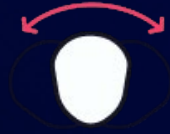
### Features



Tilt Controls



Facial Expressions



Head Motion



Virtual Buttons



Switch Control



Voice Controls & Dictation

### Engine Utilization

#### Before AI Offload

CPU

10%

iGPU

30%

#### After

NPU

~5%

# Balanced AI Performance

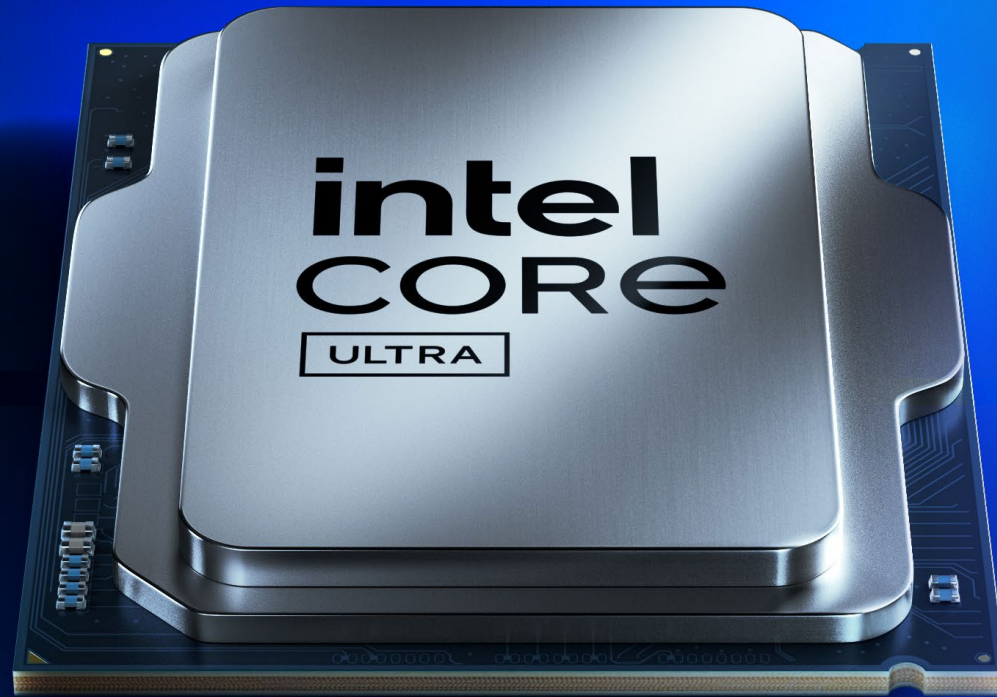
Up to

**50% faster  
creator AI**

AI-assisted video editing vs. AMD 9950X

**Intel's first  
Desktop AI PC**

With full hardware AI support



Intel® Core™ Ultra 200S Series

# Great Creator Performance

Up to

**7x faster  
timeline playback**

of pro video codecs vs. AMD 9950X

Up to

**20% faster  
rendering**

Ray-traced rendering vs. AMD 9950X



As of October 2024, among desktop processors targeting ~125W TDP. Results may vary based on use, configurations, and other factors. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for details.

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# The Most Modern Platform for Enthusiasts



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intel®

# 800 Series Chipset

Fantastic platform I/O for LGA1851

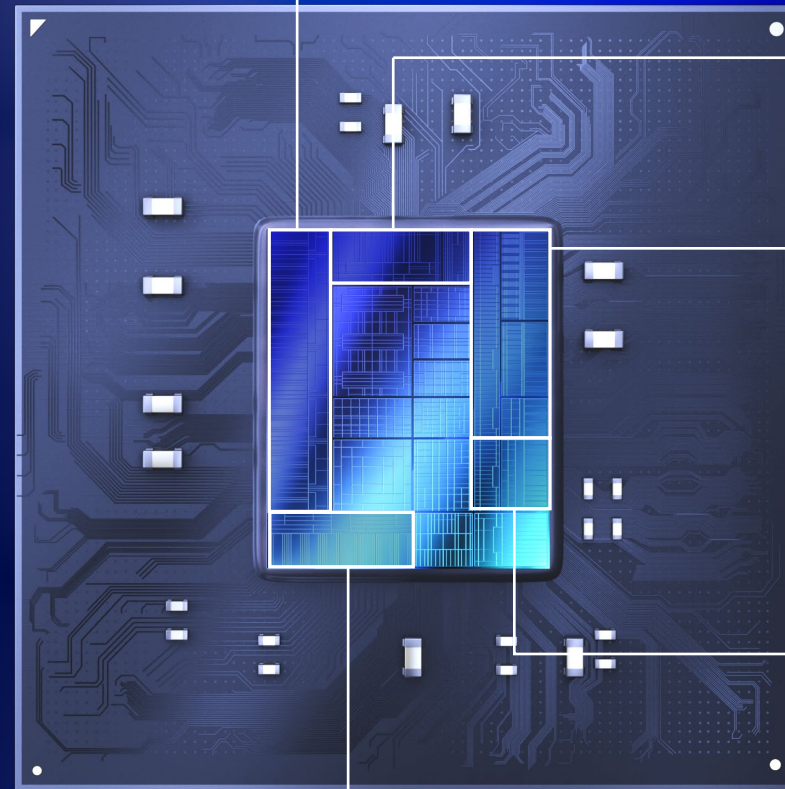
CPU + Chipset

**48x**

PCIe lanes

**20x**

PCIe 5.0



Up to  
**24x PCIe® 4.0**

Up to  
**4x eSPI**

Up to  
**10x USB 3.2**

5x 20G option

10x 10G option

10x 5G option

Up to  
**14x USB 2.0**

Up to  
**8x SATA 3.0**

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# Uncompromised Platform Connectivity

The latest connectivity including Thunderbolt™ 4 integrated on desktop for first time

	 Thunderbolt™	 Thunderbolt™ Share	 Wi-Fi™	 Bluetooth®	 Ethernet
<b>Integrated</b>	Up to 2 ports <b>Thunderbolt™ 4</b>	PC to PC screen sharing  Peripherals and storage sharing	<b>intel KILLER</b> <b>Wi-Fi 6E</b> (Gig+)	<b>Bluetooth 5.3</b> Bluetooth LE	<b>1GbE</b>
<b>Discrete</b>	Up to 4 ports <b>Thunderbolt™ 5</b>	Fast and secure file transfer  Quick data migration to new PC	<b>intel KILLER</b> <b>Wi-Fi 7</b> (5 Gig)	<b>Bluetooth 5.4</b> Bluetooth LE	<b>2.5GbE</b>




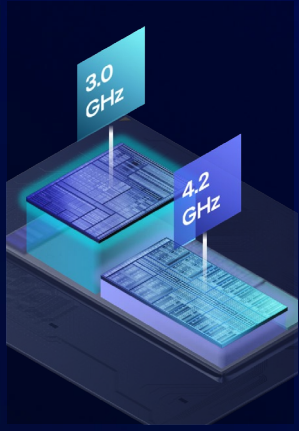
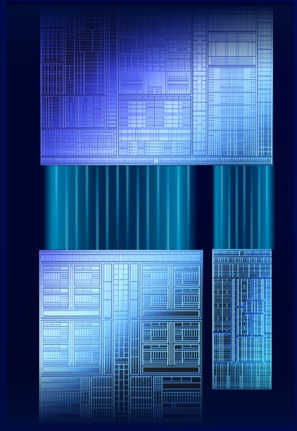
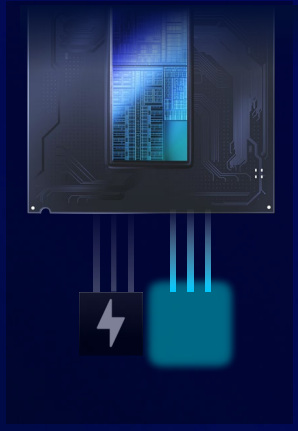
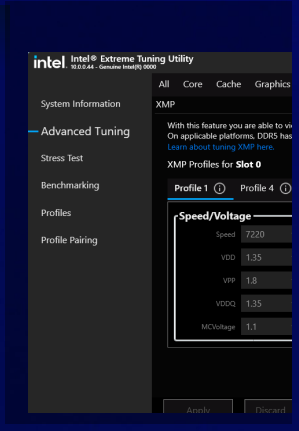
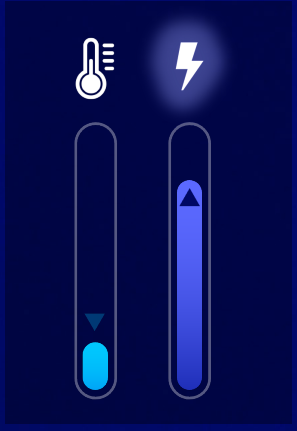
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# Overclocking Overhauled

New overclocking functionality with fine grain control

							
<p><b>Granular core clock</b></p> <p>Top turbo frequency in 16.6 MHz steps for P-cores and E-cores</p>	<p><b>Dual base clock</b></p> <p>Run an independent BCLK for SoC and compute tiles</p>	<p><b>Tile-to-Tile &amp; fabric OC</b></p> <p>Can apply a static/BIOS ratio and supports dynamic ratio changes for fabric</p>	<p><b>DLVR bypass</b></p> <p>Bypass the internal voltage management using external supply for extreme OC</p>	<p><b>Intel eXtreme tuning utility</b></p> <p>New features including automated OC enhancements</p>	<p><b>Memory overclocking</b></p> <p>New memory controller supports new XMP and CUDIMM DDR5</p>	<p><b>P &amp; E-core overclocking</b></p> <p>P-core per-core V/f control, and E-core per-cluster V/f control</p>	<p><b>Low temperature overvolting</b></p> <p>Increasingly bypass voltage limits as the chip gets colder</p>

# Room to Max Out Memory

Run the largest and toughest apps, models and scenes

Up to  
**DDR5  
6400**

Up to  
**48GB  
per DIMM**

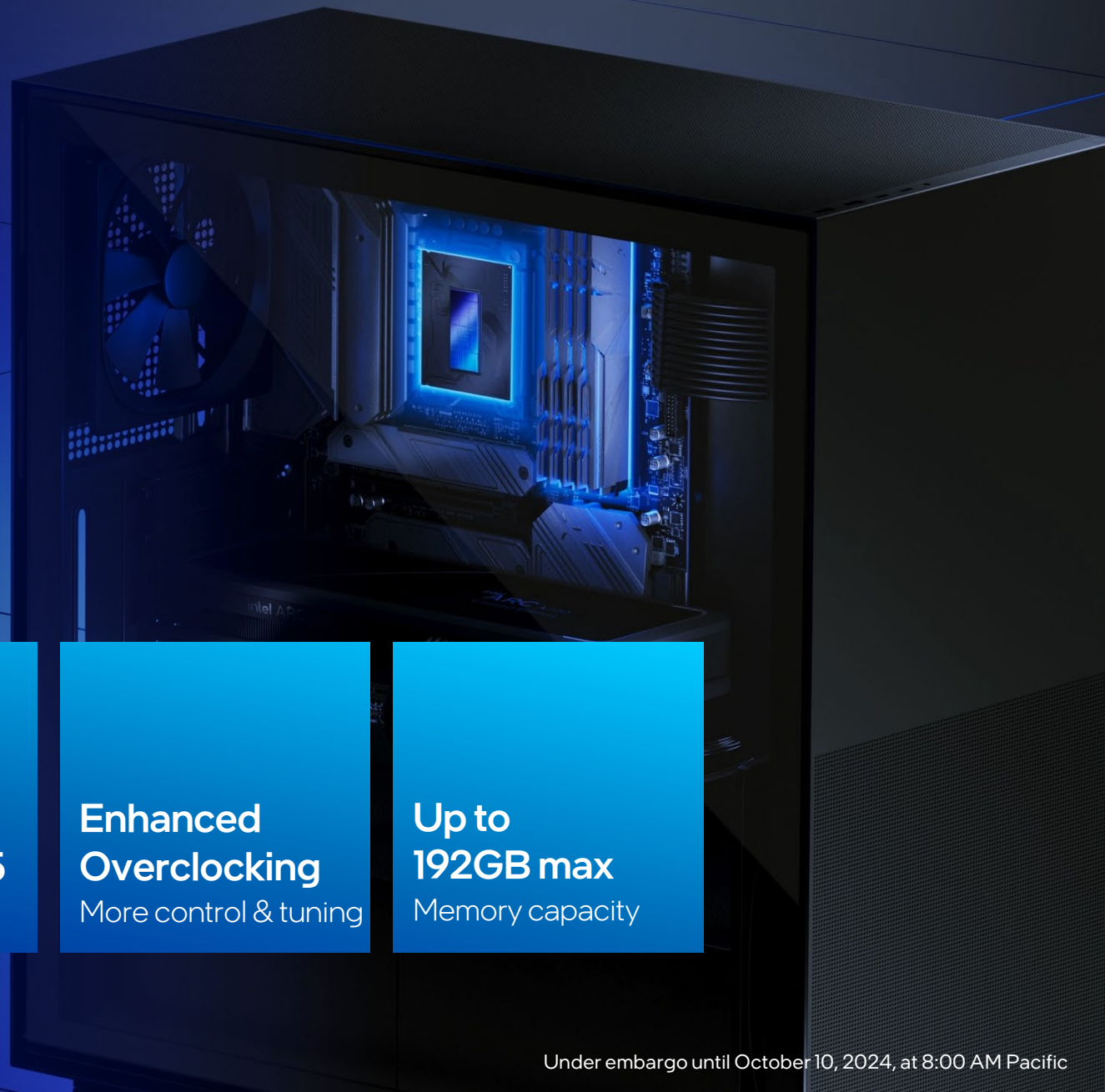
Up to  
**192GB max  
capacity**

**ECC**  
support

**Dual**  
channel

UDIMM  
CUDIMM  
SODIMM  
CSODIMM

# The Intel Platform Advantage



**The Latest Connectivity**  
for Enthusiasts

**Wi-Fi 6E & Thunderbolt 4**  
Integrated

**Wi-Fi 7 & Thunderbolt 5**  
Discrete

**Enhanced Overclocking**  
More control & tuning

**Up to 192GB max**  
Memory capacity



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# Intel Core Ultra 200S Series

The complete enthusiast solution

Enthusiast  
Gaming

Flagship  
Gaming  
FPS

Parity vs. Intel® Core™ i9-14900K  
and AMD Ryzen™ 9 9950X,  
geomean 31 games

Fastest  
Multithread

up to **+13%**

Faster CPU  
compute perf

vs. AMD Ryzen™ 9 9950X,  
average of four nT workloads

Cooler and  
Quieter

up to **17°C**

Lower CPU package  
temperatures

vs. Intel® Core™ i9-14900K  
during active PC gaming

Ultra Efficient  
Gaming

up to **165W**

Lower system  
power

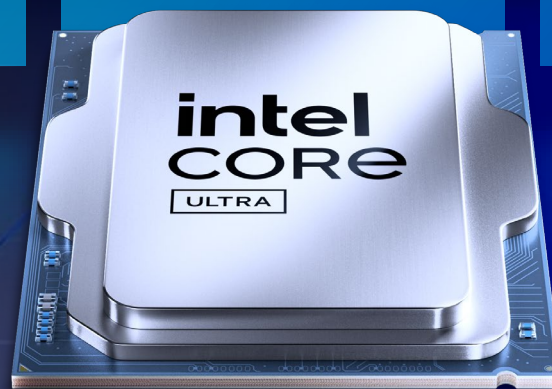
vs. Intel® Core™ i9-14900K  
during active PC gaming

Expanding  
AI PC to Desktop

**36**

Platform  
TOPS

Across the platform with VNNI,  
DP4a, and NPU acceleration



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# Intel Core Ultra 200S Series Processors

Sales and  
Pre-orders Start

Oct  
24



# Intel® Core™ Ultra 200S Series

## Launch SKUs and Pricing



Intel® Core™ Ultra 9 285K	24 Cores (8P+16E)	24 Total threads	4 GPU cores	13 TOPS NPU	5.7 Max GHz	<b>\$589 USD</b> Suggested eTail Price
Intel® Core™ Ultra 7 265K	20 Cores (8P+12E)	20 Total threads	4 GPU cores	13 TOPS NPU	5.5 Max GHz	<b>\$394 USD</b> Suggested eTail Price
Intel® Core™ Ultra 7 265KF	20 Cores (8P+12E)	20 Total threads	-- GPU cores	13 TOPS NPU	5.5 Max GHz	<b>\$379 USD</b> Suggested eTail Price
Intel® Core™ Ultra 5 245K	14 Cores (6P+8E)	14 Total threads	4 GPU cores	13 TOPS NPU	5.2 Max GHz	<b>\$309 USD</b> Suggested eTail Price
Intel® Core™ Ultra 5 245KF	14 Cores (6P+8E)	14 Total threads	-- GPU cores	13 TOPS NPU	5.2 Max GHz	<b>\$294 USD</b> Suggested eTail Price



# Intel Core™ Ultra 200S Series

Ecosystem that delivers



# Intel Core Ultra 200S Series Processors (K-SKUs)

		Intel® Core™ Ultra 9 285K	Intel® Core™ Ultra 7 265K	Intel® Core™ Ultra 7 265KF	Intel® Core™ Ultra 5 245K	Intel® Core™ Ultra 5 245KF
CPU	Cores (P+E) <sup>1</sup>	24(8+16)	20(8+12)		14(6+8)	
	Threads	24	20		14	
	Intel® Smart Cache	36	30		24	
	Total L2 Cache	40	36		26	
	Intel® Thermal Velocity Boost Frequency (GHz) <sup>2</sup>	5.7	N/A		N/A	
	Intel® Turbo Boost Max Technology 3.0 Frequency (GHz) <sup>2</sup>	5.6	5.5		N/A	
	P-core Max Turbo Frequency (GHz) <sup>3</sup>	5.5	5.4		5.2	
	P-core Base Frequency (GHz) <sup>3</sup>	3.7	3.9		4.2	
	E-core Max Turbo Frequency (GHz) <sup>3</sup>	4.6	4.6		4.6	
E-core Base Frequency (GHz) <sup>3</sup>	3.2	3.3		3.6		
GPU	Processor Graphics	Intel® Graphics	Intel® Graphics	N/A	Intel® Graphics	N/A
	Xe Cores	4	4	N/A	4	N/A
	GPU Max Frequency	2 GHz	2 GHz	N/A	1.9 GHz	N/A
	GPU Base Frequency	300 MHz	300 MHz	N/A	300 MHz	N/A
NPU	Neural Compute Engines	2x Gen3				
	NPU Peak TOPS	13 TOPS				
Mem & I/O	CPU PCIe Lanes	24 lanes				
	Maximum JEDEC DRAM Speed	DDR5-6400				
	Memory Channels	2ch				
	Maximum Memory Capacity <sup>5</sup>	192GB				
Power	Processor Base	125W				
	Maximum Turbo Power	250W	250W		159W	
Features	Reliability, Availability & Serviceability <sup>6</sup>	Enabled	Enabled	Disabled	Enabled	Disabled
	Intel® SIPP	Yes	Yes	No	Yes	No
	Intel® vPro	Yes	Yes	No	Yes	No
	Intel® ISM	Yes				



Coming Soon  
Intel Core Ultra  
H & HX Series

Arriving  
1Q25

Enthusiast mobile performance at lower power

Intel's first ever mobile AI PC for gamers & creators

Maximized control & connectivity

