

Notices and Disclaimers

Performance varies by use, configuration and other factors. Learn more at intel.com/performanceindex. Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure. Your costs and results may vary.

Intel technologies may require enabled hardware, software or service activation.

Some images may have been altered or simulated for illustrative purposes

AI features may require software purchase, subscription or enablement by a software or platform provider, or may have specific configuration or compatibility requirements. Data latency, cost, and privacy advantages refer to non-cloud-based AI apps. Learn more at intel.com/AIPC.

AI playground is only compatible with select Intel Arc GPUs that meet minimum graphics memory requirements. Learn more about AI playground at intel.com/ai-playground

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.



Intel Arc B-Series Launch Briefing

Tom Petersen Intel Fellow, Client Graphics



intel
ARC

GRAPHICS

The Modern Gaming Experience for Millions of Gamers



GPUs for
Graphics Cards



GPUs for
Laptops



GPUs for
Gaming Handhelds

intel ARC B-Series



Modern Gaming
Features



Best-in-Class
Performance per Dollar



AI
Acceleration

The Modern Gaming Experience

More Realistic
Lighting



Highly Detailed
Graphics

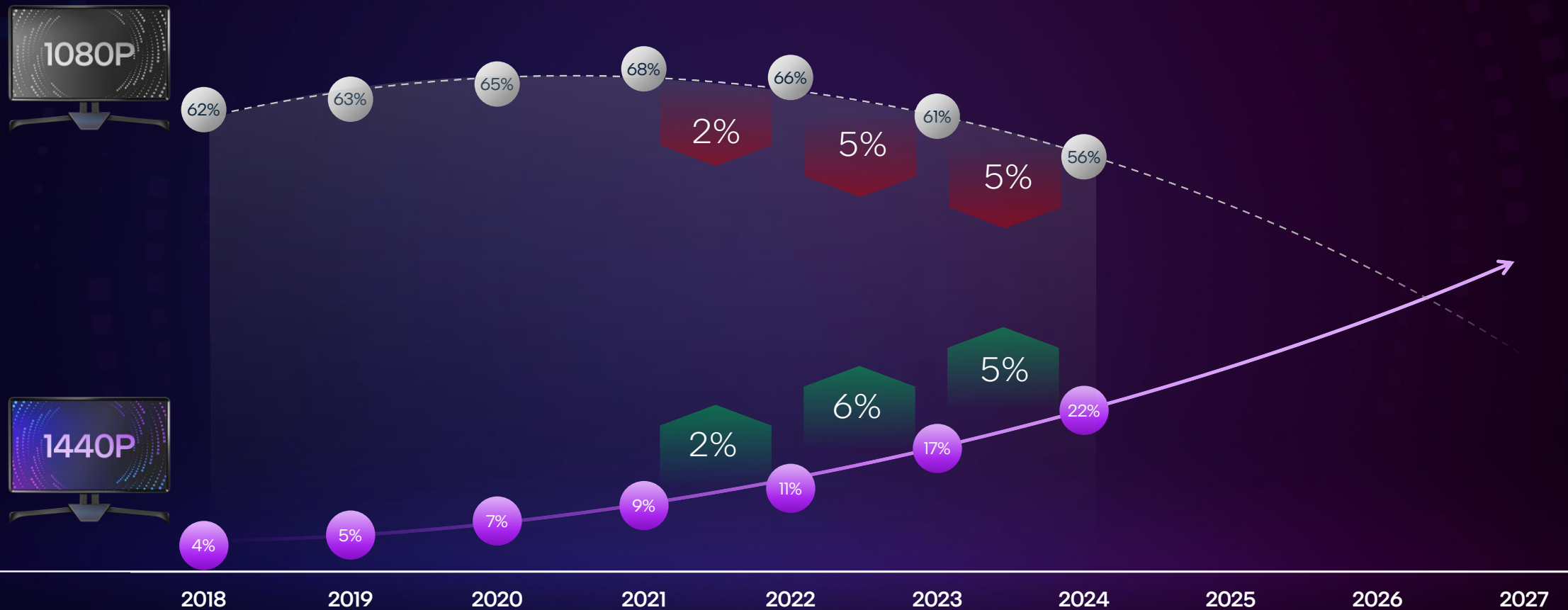


1440p Ultra
Gaming



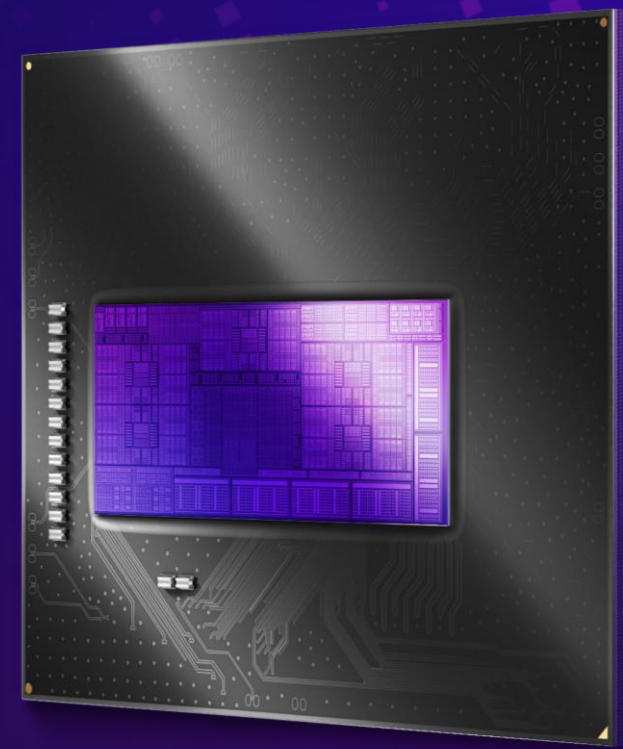
1440p fastest growing resolution

Amongst gamers



X^e2 and BMG-G21 SoC Architecture

Xe2





Xe

First time scaling the engine

Building the software stack

Efficiency



Xe2

Higher utilization

Improved work distribution

Less SW Overhead

Continuous Software Improvements

50+

Drivers since Launch

120+

New Games Supported
with Day-0 Drivers

2.5x

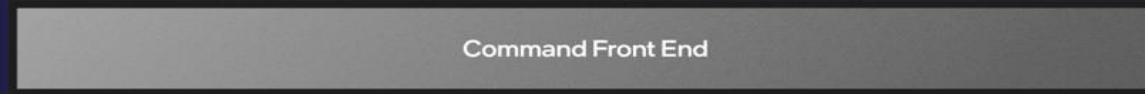
Game Coverage

Xe2

Render Slice

Deep micro and macro **analysis** of all graphics acceleration functions

Optimized to reduce latency, remove stalls and improve HW/SW handshake



Native Support for Execute Indirect

Significant increased in Performance per core



Native SIMD16 ALUs
4-deep XMN

3 Traversal Pipelines
18 Box Intersections
2 Triangle Intersection

Out of Order Sampling
2x Throughput without Filtering
Programmable Offsets

3x Vertex Fetch Throughput
3x Mesh Shading Performance

50% more HiZ/Z/Stencil cache
Earlier HiZ Culling for small primitives

Up to 2x Blending Throughput
33% more Pixel Color Cache
Render Target Prefetch

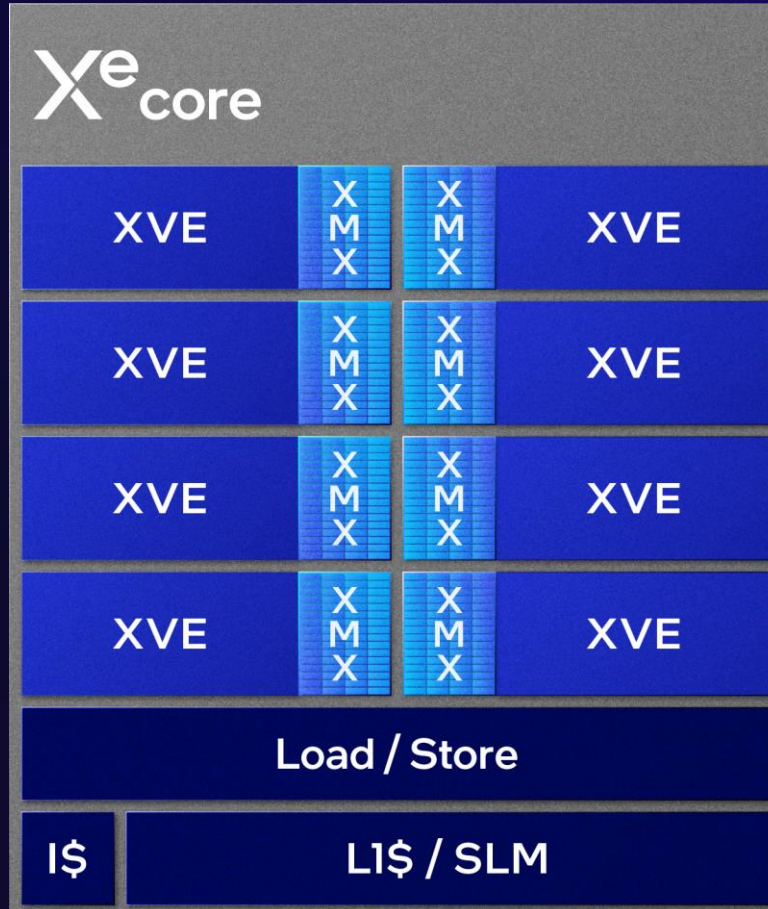
8:N Compression
Fast Clear for sub-resources



2nd GEN

Xe core

Compute resources repartitioned in native SIMD16 engines for increased efficiency



8 512-bit Vector Engines

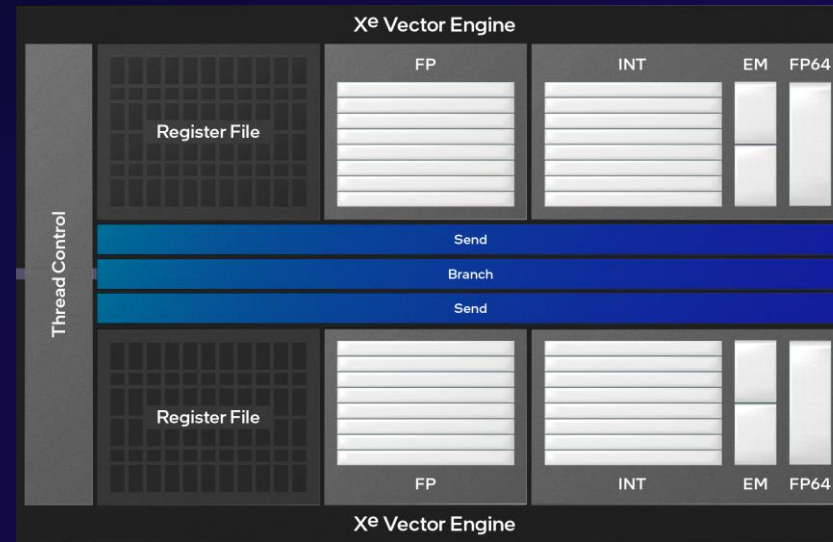
8 2048-bit XMX Engines

64b atomic ops support

256KB Shared L1\$ / SLM

New

New Vector Engine



SIMD16 native ALUs

Support for SIMD16 and SIMD32 ops

Xe matrix extensions

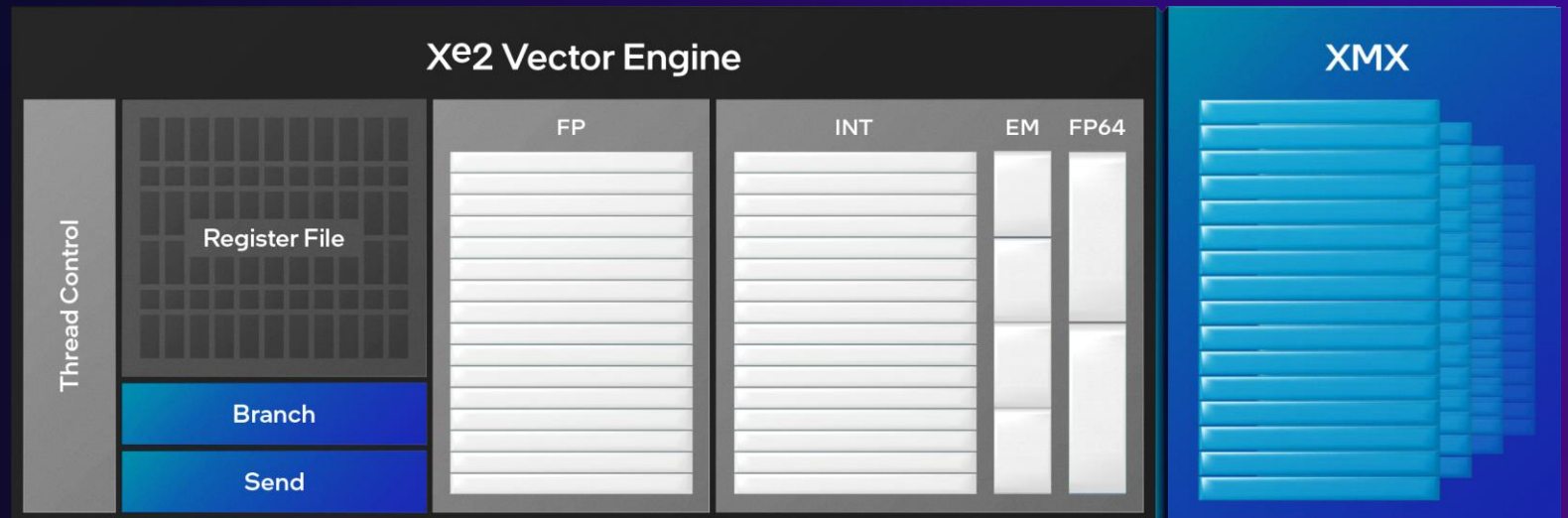
Support for INT2, INT4, INT8, FP16, BF16, TF32

Extended Math and FP64

Transcendentals: SIN, COS, LOG, EXP...

3-way co-issue

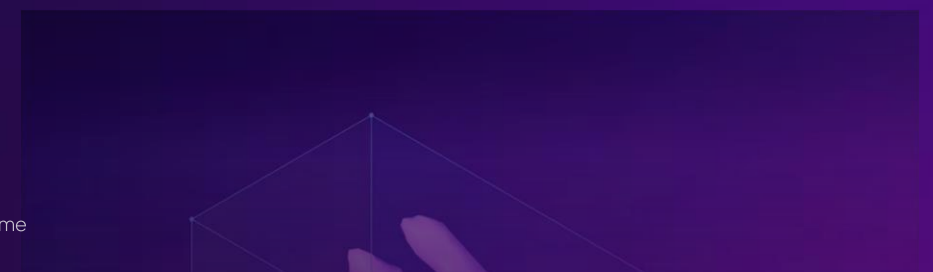
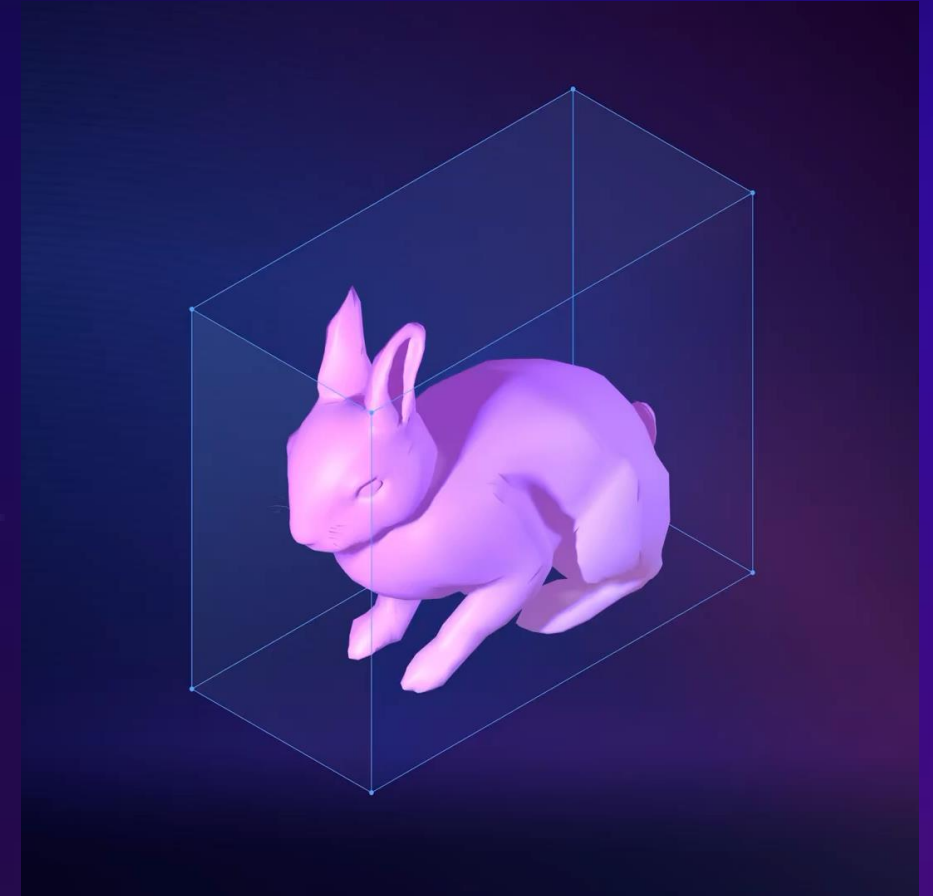
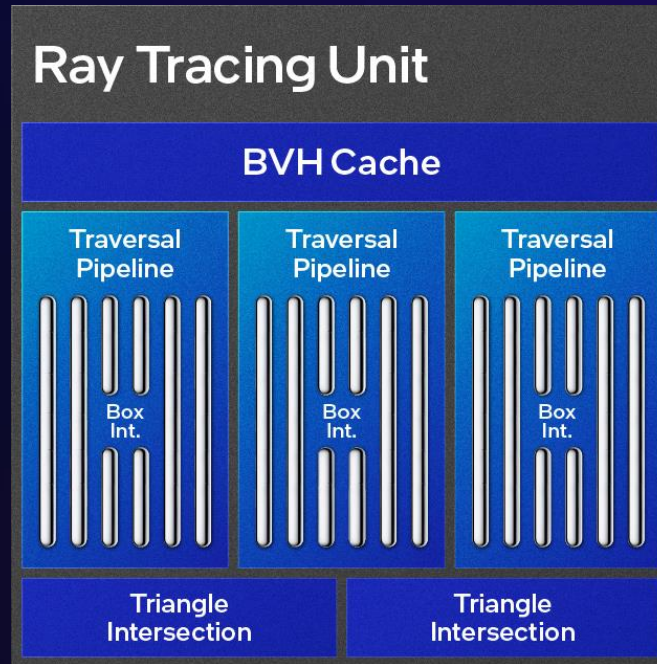
FP + INT/EM + XMV



New

Ray Tracing Unit

3	Traversal pipelines	1.5x
18	Box intersections	1.5x
2	Triangle intersections	2x
16	KB BVH cache	2x



Introducing BMG-G21



5 Render Slices

20 X^e-cores

160 XMX Engines

20 Ray Tracing Units

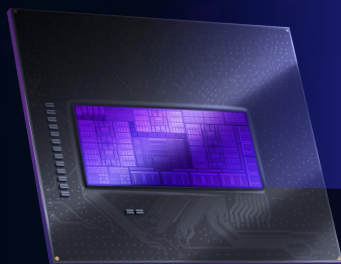
20 Texture Samplers

10 Pixel Backends

18 MB L2 Cache

192-bit GDDR6

2 Multi-Format X-coders



BMG-G21 dGPU with X^e2 architecture

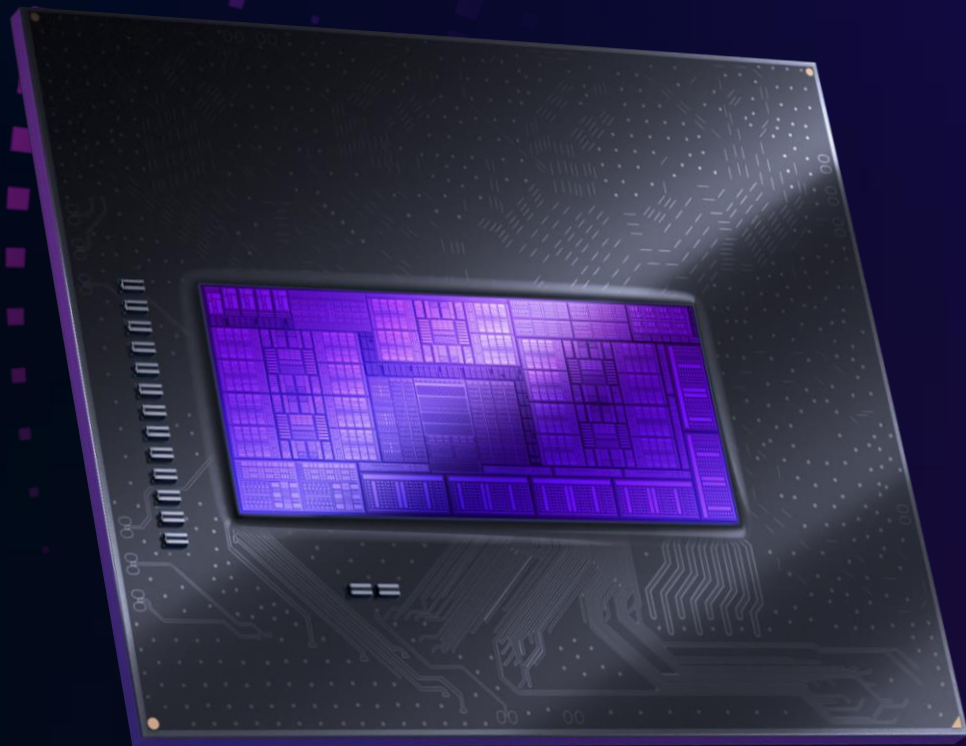
Redesigned for Higher Efficiency

+70%

Performance/
X^e-core

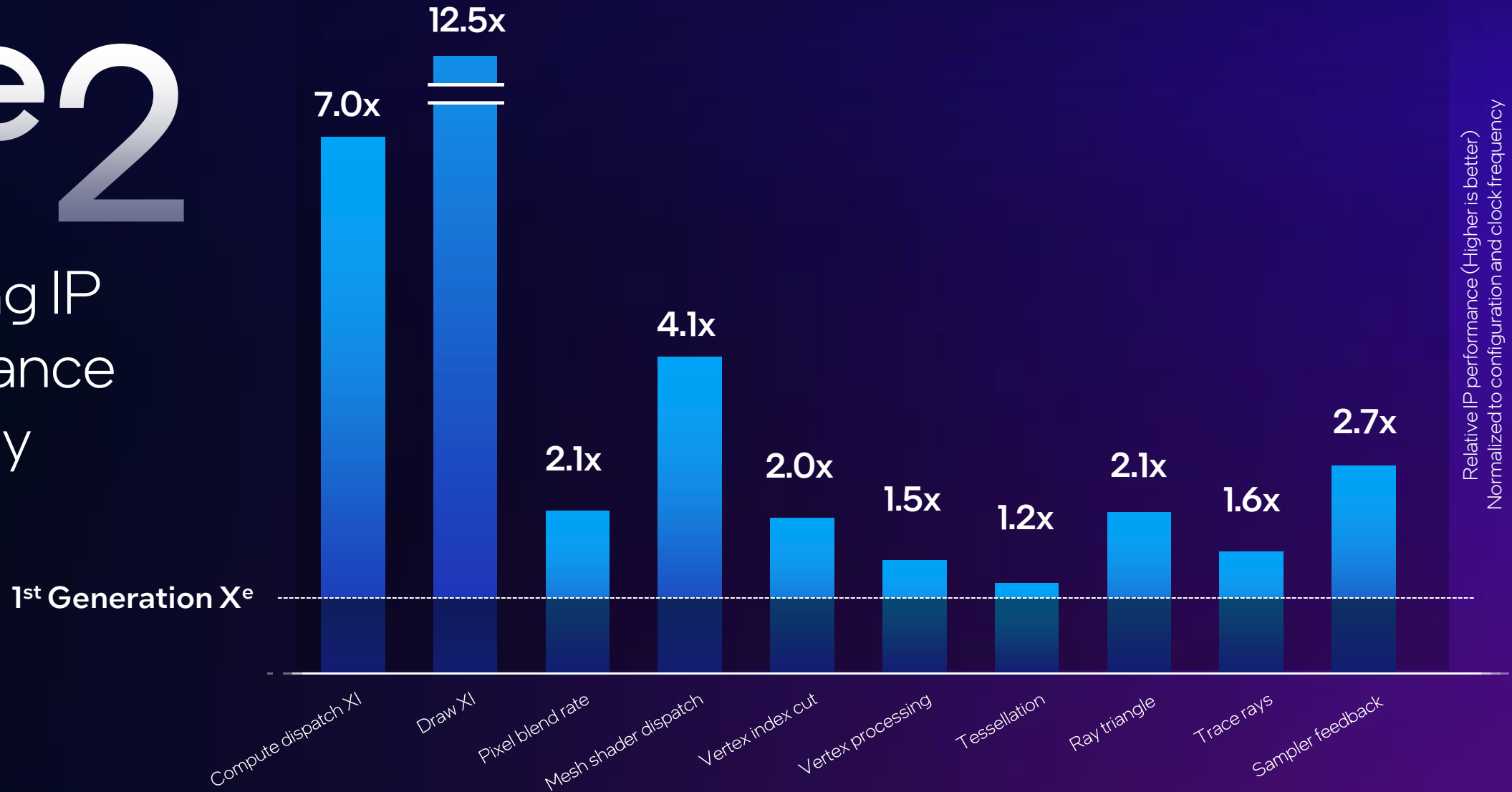
+50%

Performance/
Watt



Xe2

Improving IP
Performance
Efficiency



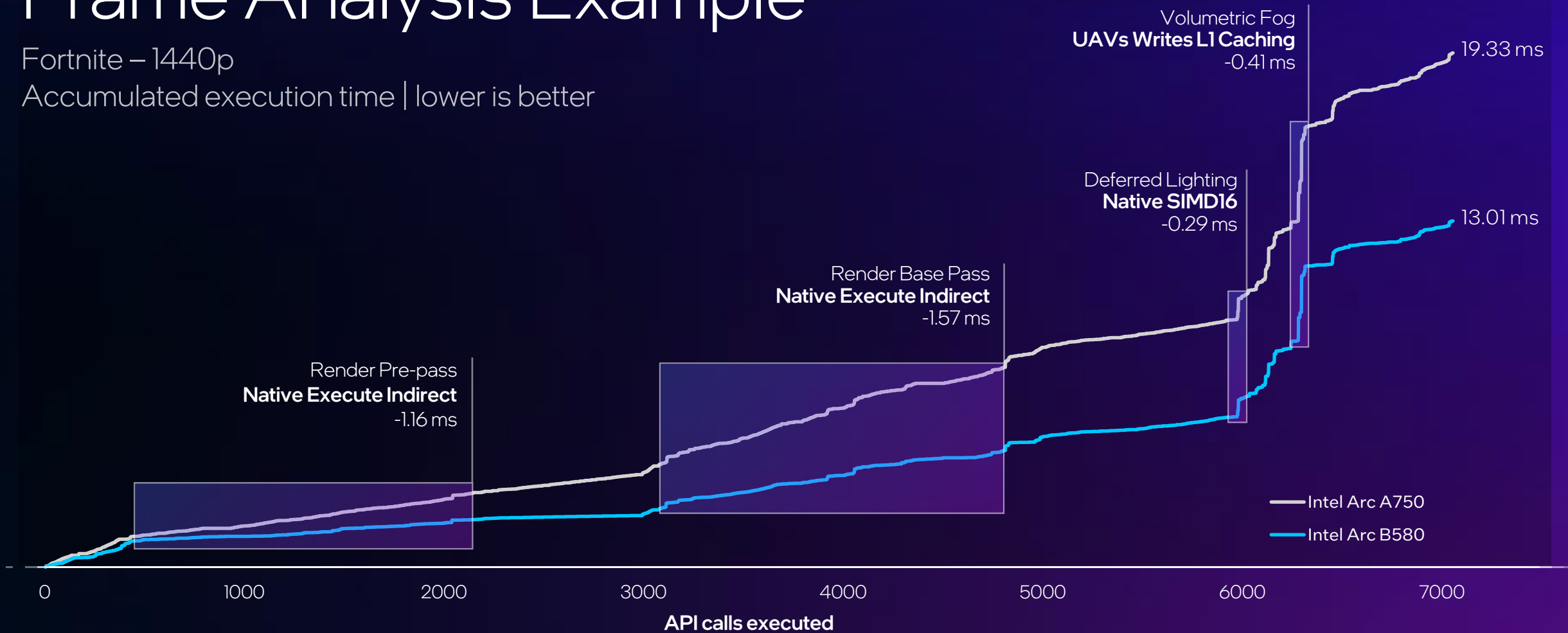
Relative IP performance (Higher is better)
Normalized to configuration and clock frequency

1st Generation Xe

Xe2 IP Improvements Frame Analysis Example

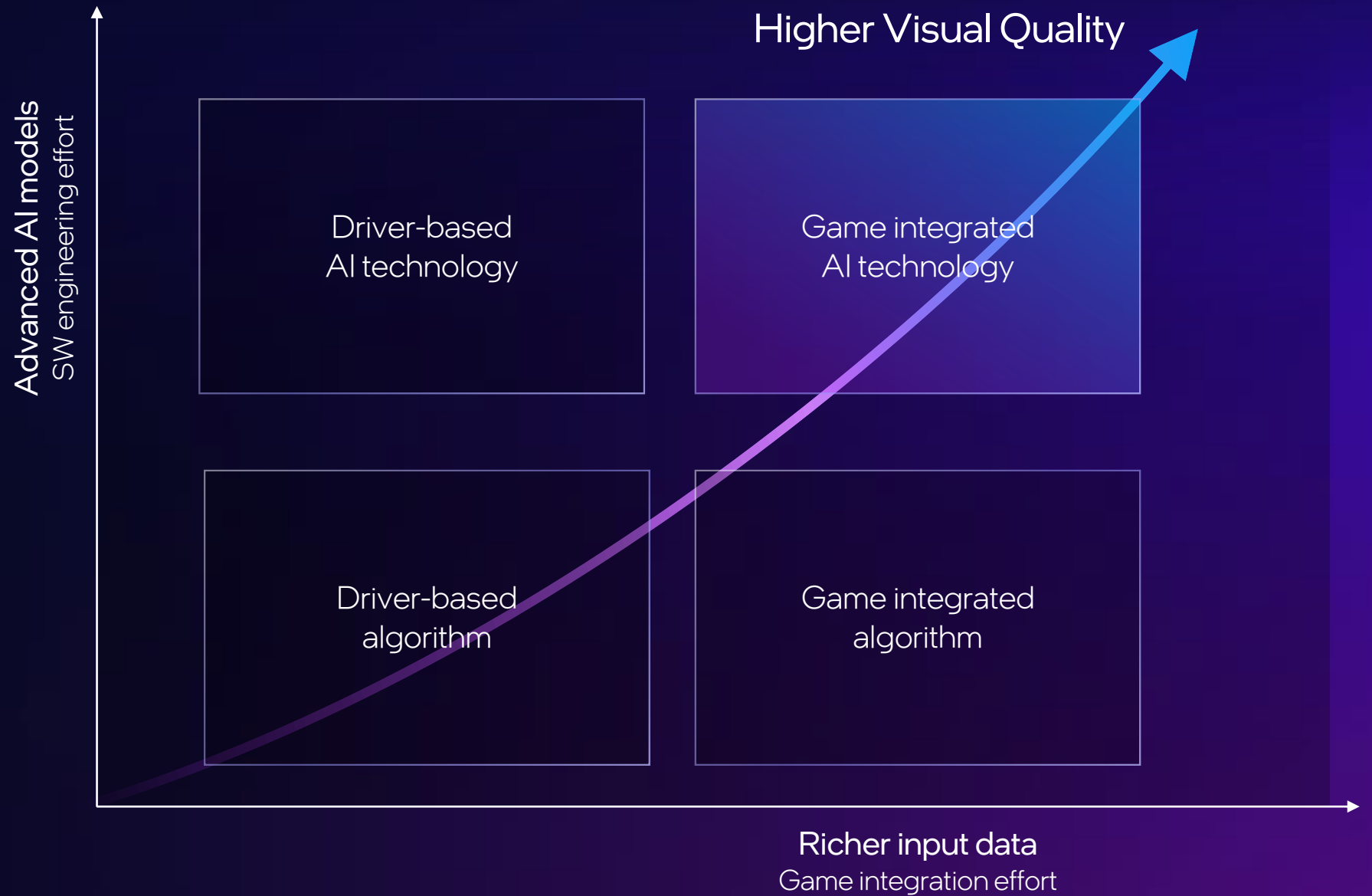
Fortnite – 1440p

Accumulated execution time | lower is better



Modern Rendering for Games

Render Less,
Generate More

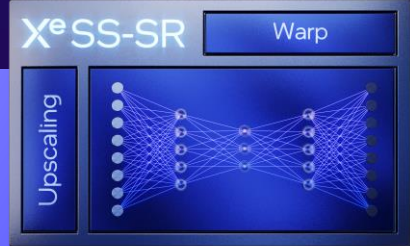


XeSS

Intel Xe^e Super Sampling
Technology



Performance



XeSS
Super
Resolution

XeSS-SR

Super Resolution



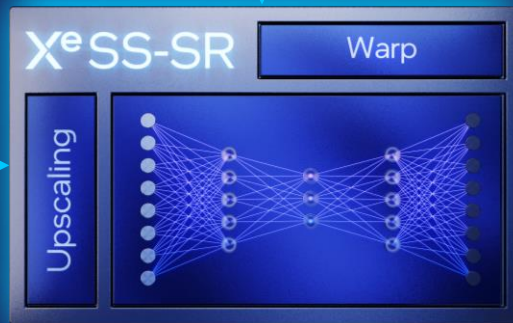
Jitter

Raster, Lighting & Pre-Effects

Motion Vectors



Low-Res
Frame Render



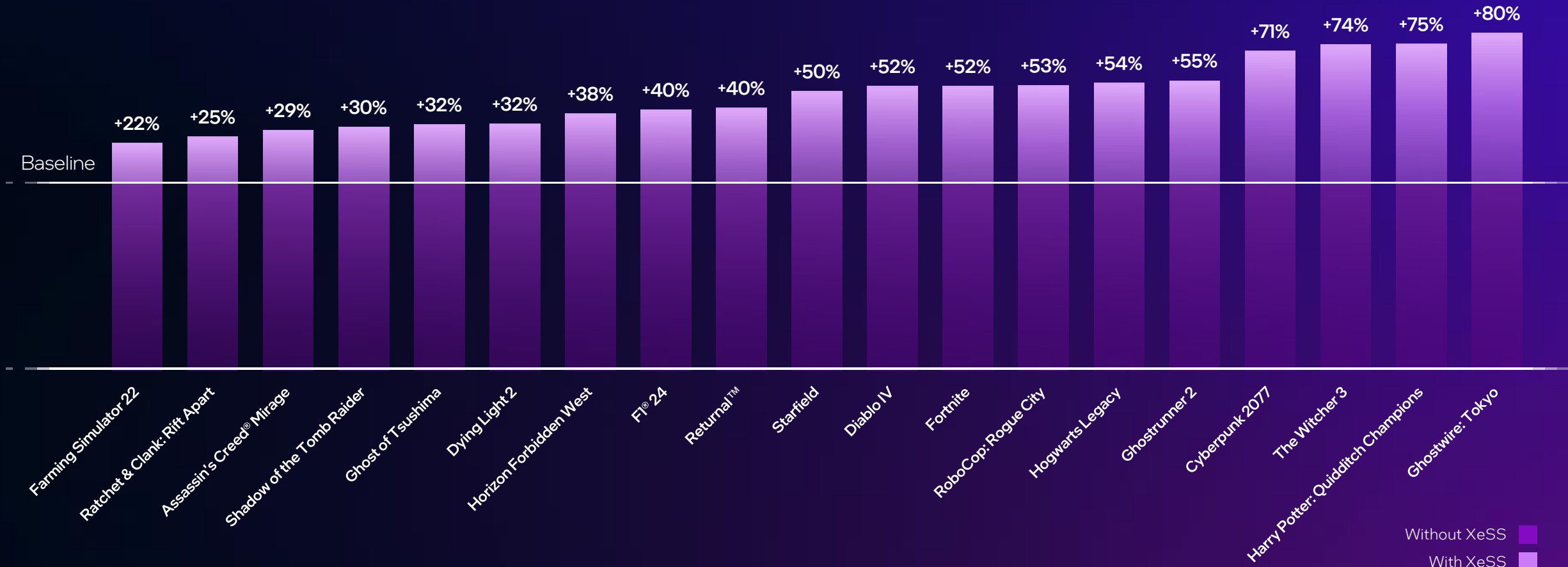
Super Resolution
Render

Post-Effects

+47% Average Performance with XeSS

Intel® Arc™ B580
Graphics Card

1440p Ultra | XeSS Performance Mode
FPS | Higher is Better

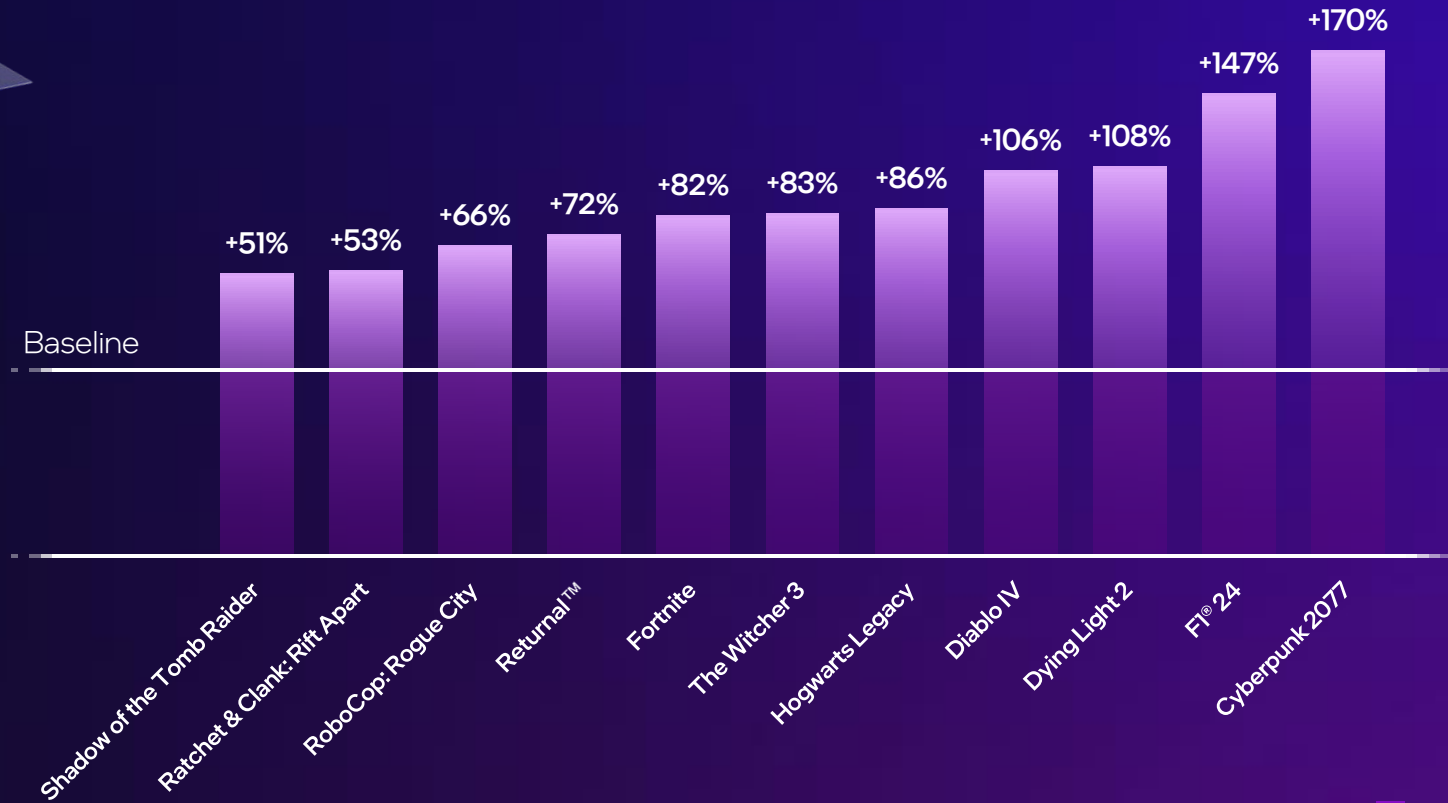
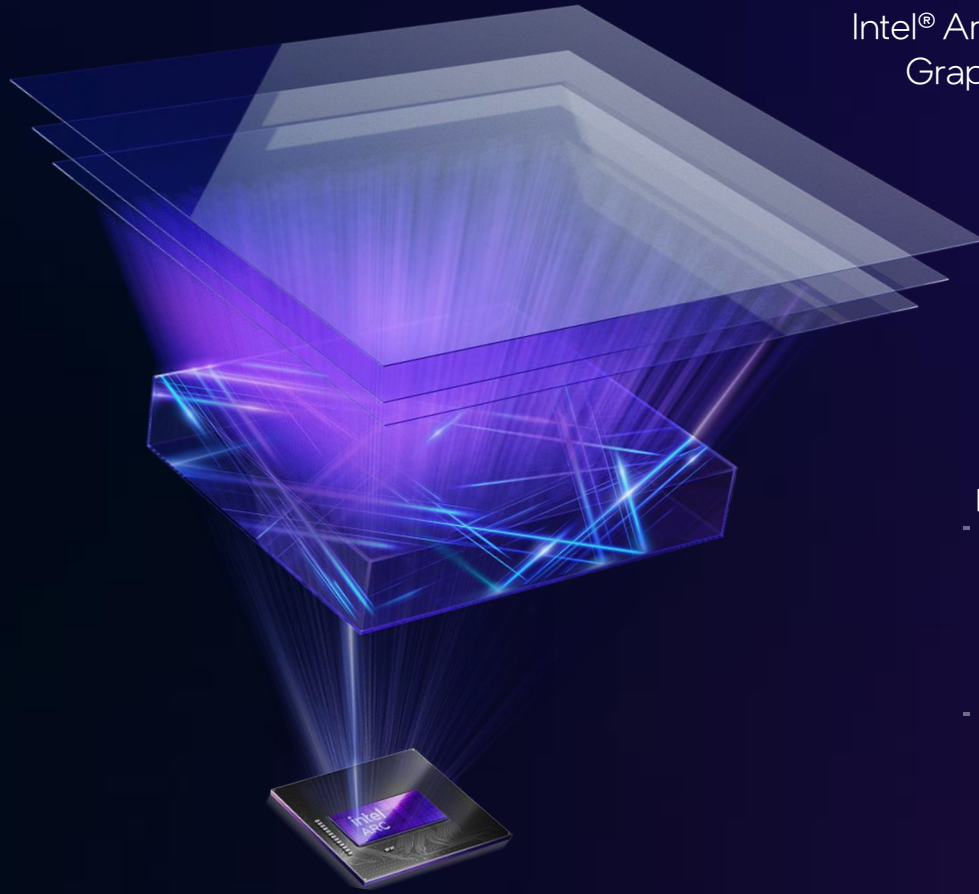


Without XeSS
With XeSS

Unlock Ray Tracing with XeSS

Intel® Arc™ B580
Graphics Card

1440p Ultra | RT Enabled | XeSS Performance Mode
FPS | Higher is Better



Without XeSS
With XeSS

MYTH OF EMPIRES

HOMEWORLD 3

DEAD BY DAYLIGHT

TEKKEN 8

Farming Simulator 25

F1 24

FORTNITE

NIGHTINGALE

天涯明月刀

Redout 2

FOREVER SKIES

LAYERS OF FEAR

Harry Potter QUIDDITCH CHAMPIONS

AEW FIGHT FOREVER

JAGGED ALLIANCE 3

RATCHET & CLANK RIFT APART

Forgotten MATH

CRSED

CONQUEROR'S BLADE

CRIME BOSS ROCKAY CITY

BLOODHUNT

DEADLINK

DEATH STRANDING DIRECTORS CUT

DECEIVE INC.

LIKE A DRAGON: Spin!

BOLMEN

ROBOCOP ROGUE CITY

DYING LIGHT 2 STAY HUMAN

DYSTERRA

ENLISTED

REMNANT

STARSHIP ROBBERS EXTERMINATION

DOUGLAS DUFFIELD CHRONICLE

NOMORE ROOM IN HELL 2

GHOST RUNNER

GHOSTBUSTERS SPIRITS UNLEASHED

GHOSTWIRE

BLACKTAIL

intel[®] X^e Super Sampling

Intel[®] X^eSS technology is now available in 150+ games

LIKE A DRAGON: The Man Who Erased His Name.

THRONE AND LIBERTY

GOATHAM KNIGHTS

HOGWARTS LEGACY

HIGH ON LIFE

SYNCED

LOST JUDGMENT

MARTHA IS DEAD

JUDGMENT

GOD

ARCADEGEDDON

RETURNAL

THE RIFT BREAKER

SCATHE

SHADOW OF THE TOMB RAIDER DEFINITIVE EDITION

HITMAN III

WI-FI RUSH

CHORVS

NARAKA

ANVIL

GRID LEGENDS

SP SUPER PEOPLE

CHERNOBYLITE

LIKE A DRAGON INFINITE WEALTH

CHIVALRY II

Pinball FX

ASSASSIN'S CREED MIRAGE

T.A.L.O.S PRINCIPLE

FORZA HORIZON 5

MORTAL KOMBAT

GORO CUDDLY CARNAGE

60 DAYS

ASCENDANT .COM

Japanese Drift Master JDM

[REDACTED]

Funko FUSION

DYNASTY WARRIORS

逆水寒

ONCE HUMAN

THE FIRST BERSERKER KHAZAN

Axis Unseen

THE PATH OF THE GODS

STILL WAKES THE DEAD

ASSASSIN'S CREED

SPEED FREEK

NIGHT OF THE DEAD

Under embargo until December 3, 2024, at 6:00 AM Pacific Time

XeSS Super Resolution Update

Game Engine

XeSS-SR SDK

Application Interface

new

Compute Dispatcher Backend

DirectX® 11 Interface

DirectX® 12 Interface

Vulkan Interface

Intel Kernels (Intel® Explicit SIMD)

Discrete GPU XMX

Built-in GPU XMX

Built-in GPU DP4a

Cross-Vendor Compatibility

HLSL SM6.4

XeSS Super Resolution Model



XeSS Super Resolution Lite Model

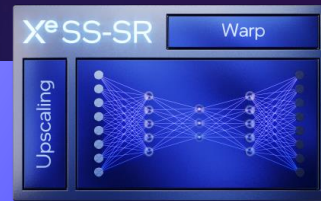


XeSS2

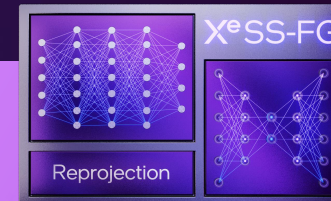
Performance

Smoothness

Responsiveness



XeSS
Super
Resolution

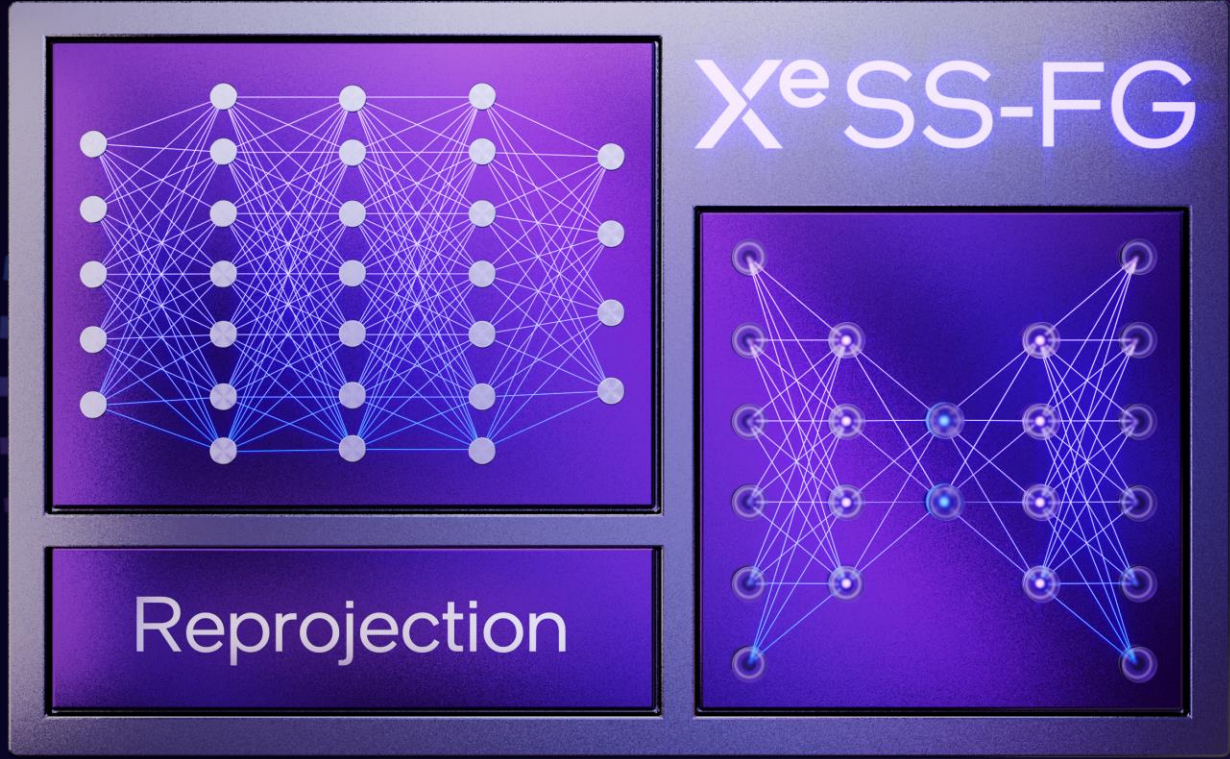


XeSS
Frame
Generation



Xe
Low
Latency





XeSS

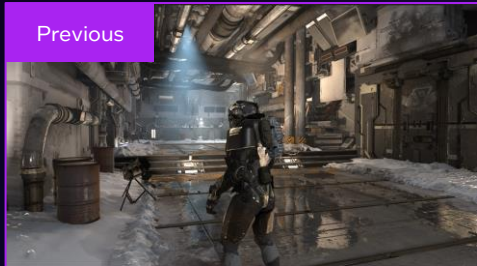
Frame Generation

XeSS-FG

Frame Generation

Render & Super Resolution

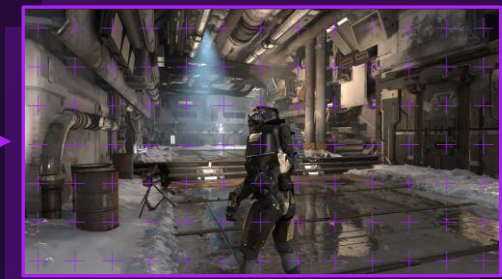
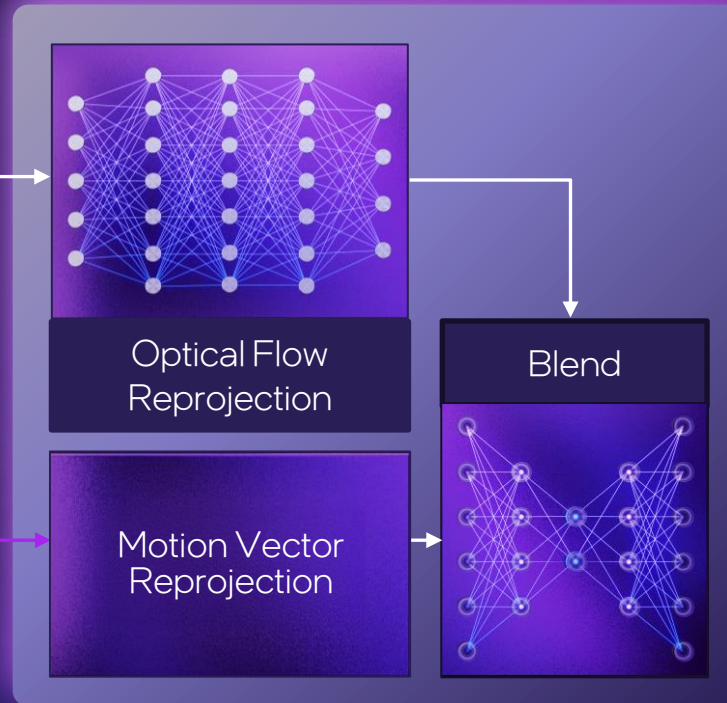
Full Resolution Frame Renders



Motion Vectors



Depth



Interpolated Frame

5

XeSS-SR

Super Resolution

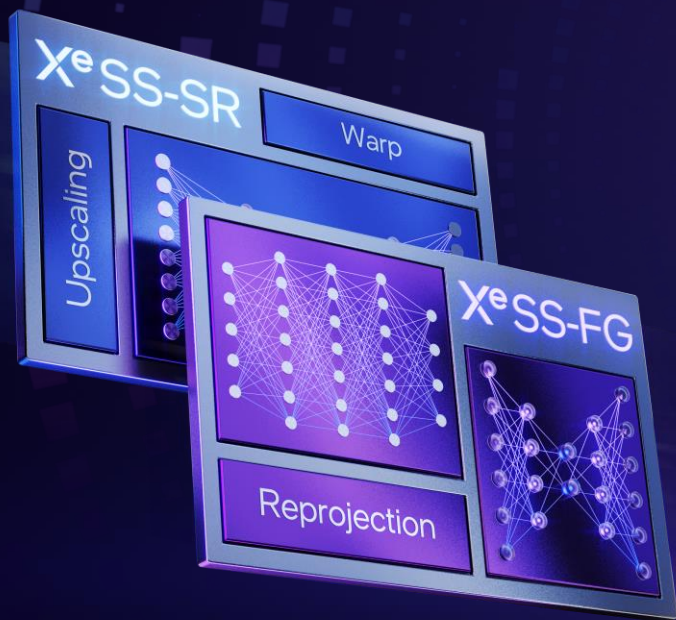


XeSS-FG

Frame Generation

XeSS 2

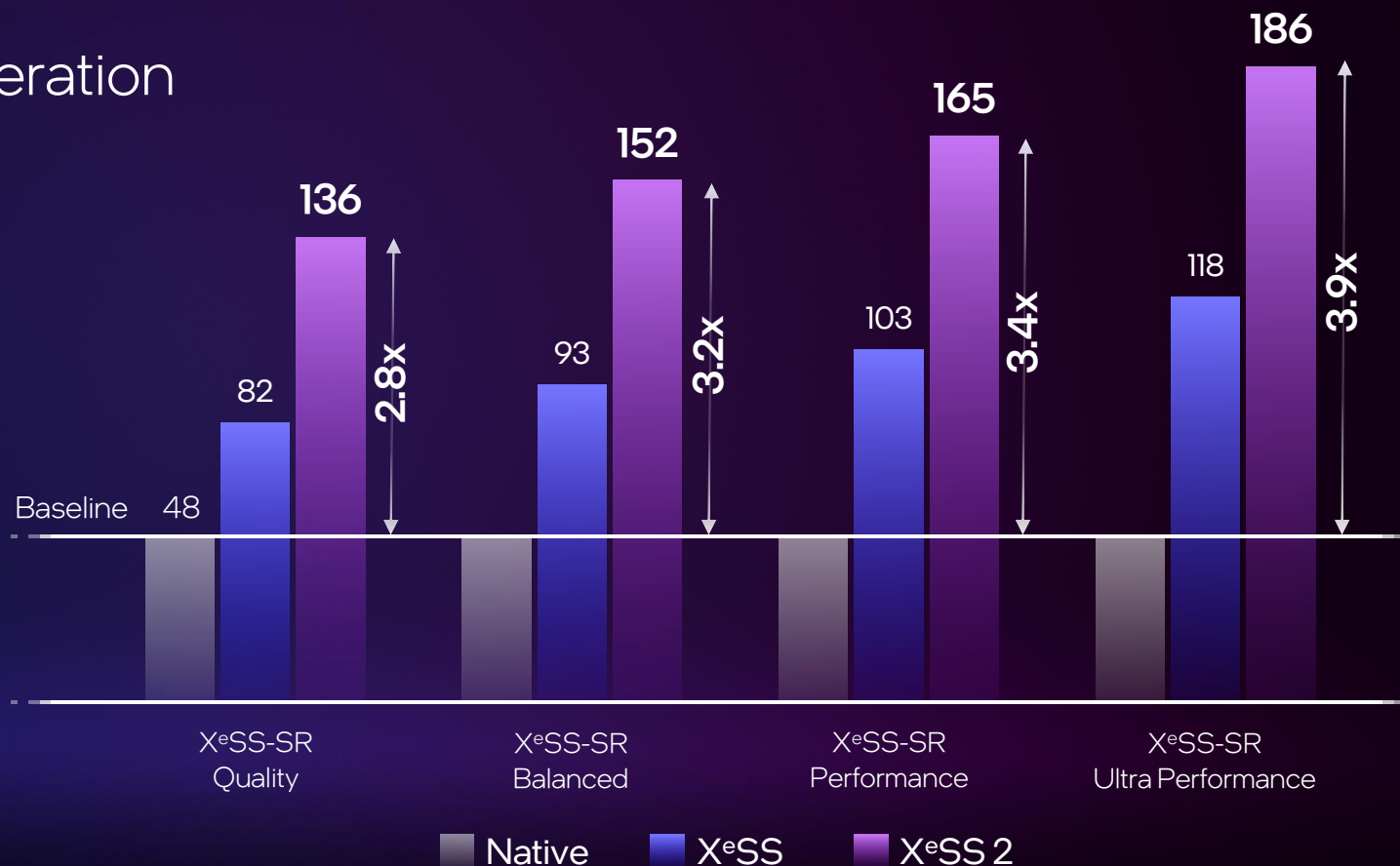
Super Resolution + Frame Generation

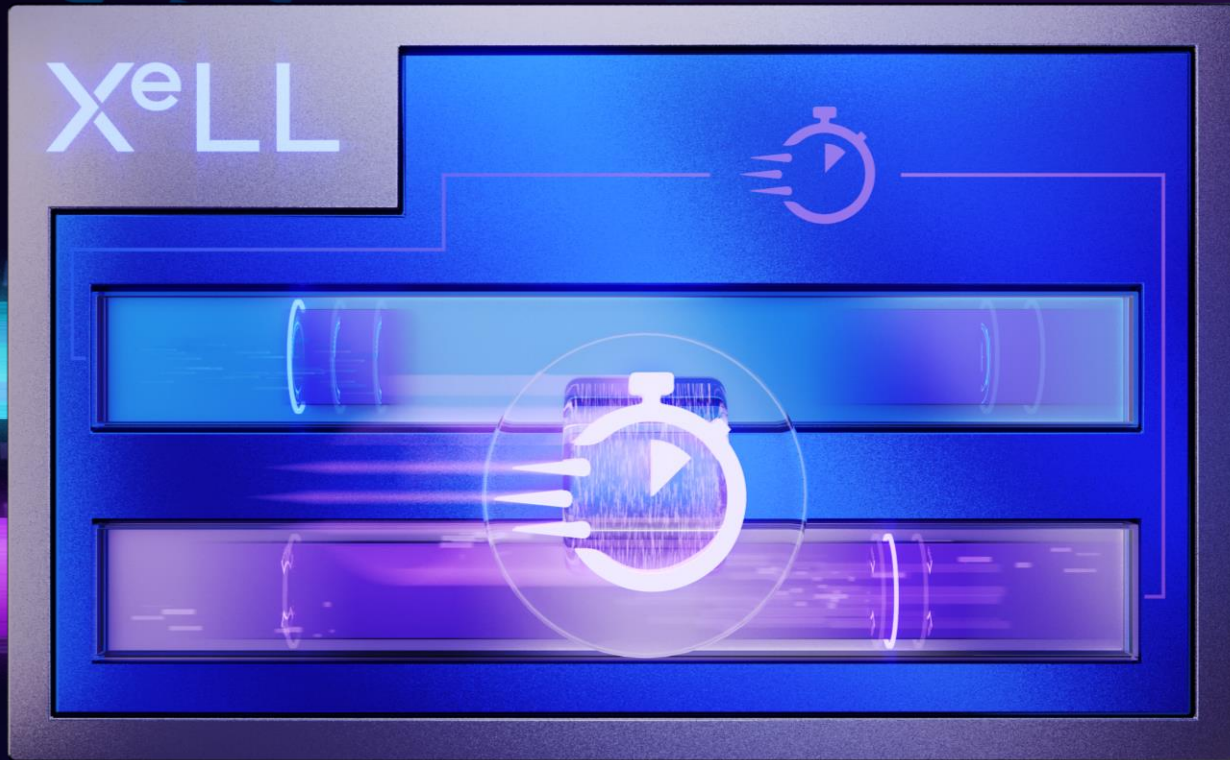


F1® 24 Gaming Performance

Intel® Arc™ B-580
Graphics Card

FPS | Higher is Better
1440p Ultra

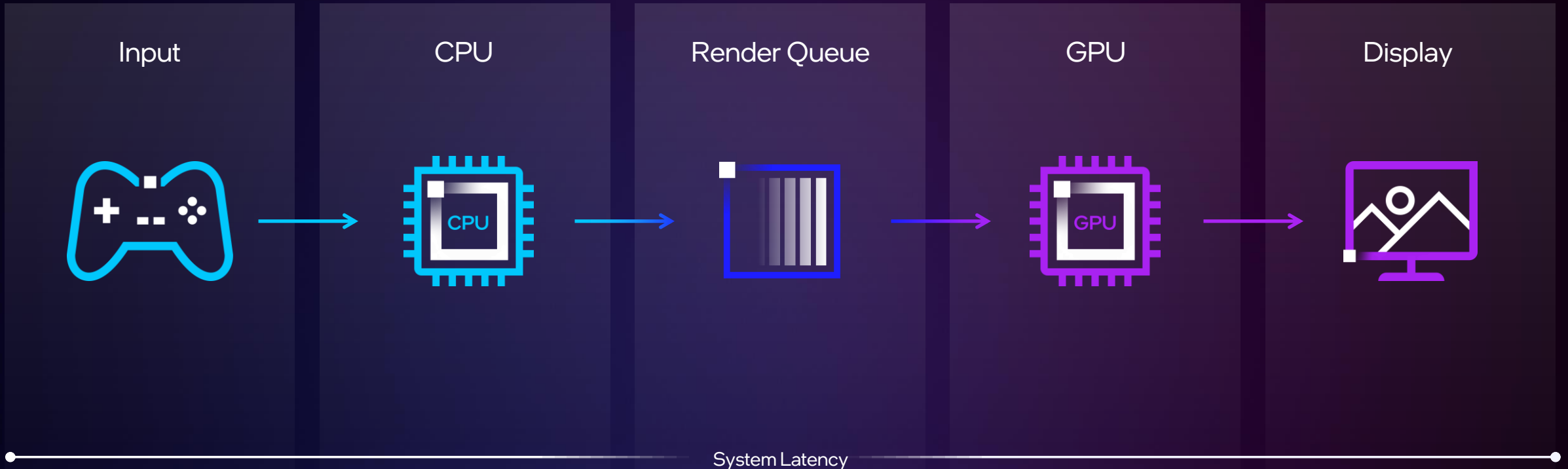




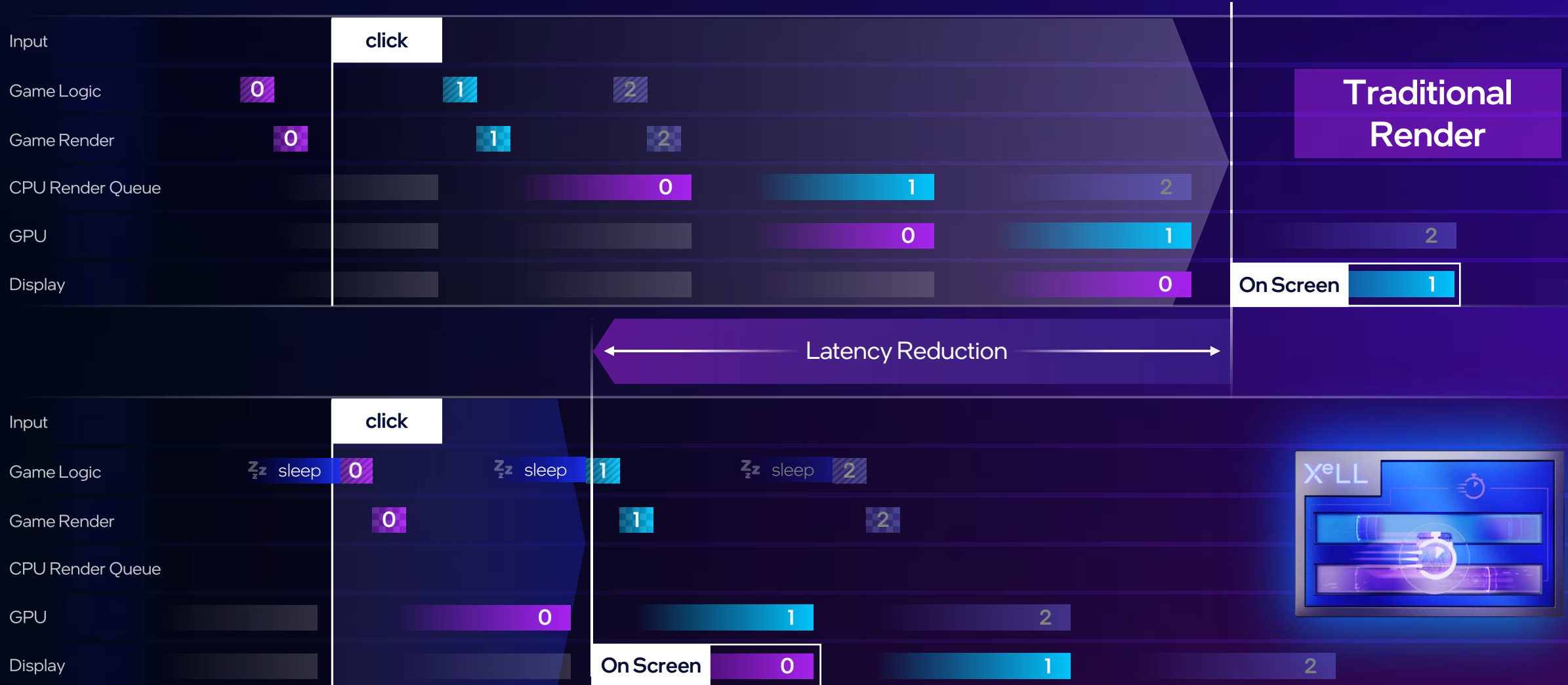
XeLL

Low Latency

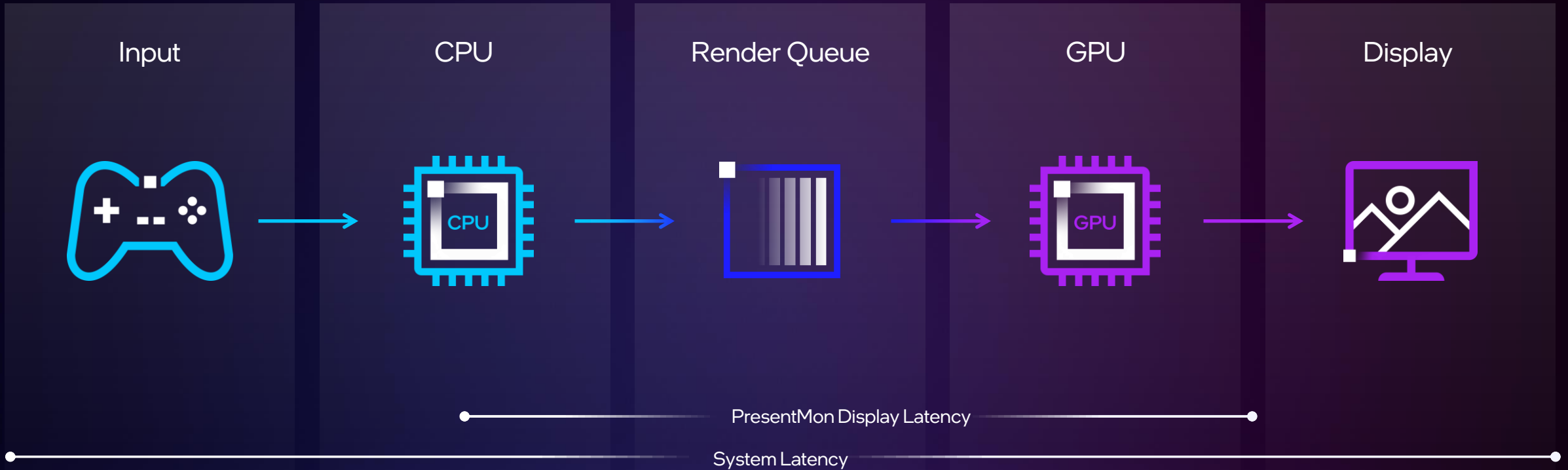
Gaming Latency



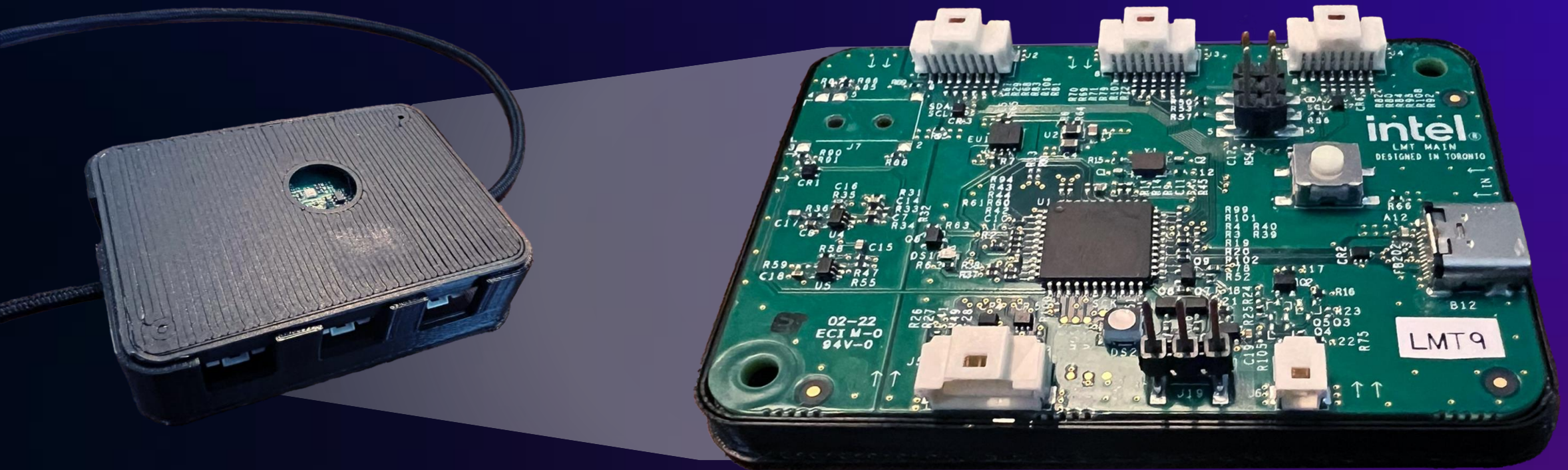
X^e Low Latency



Gaming Latency

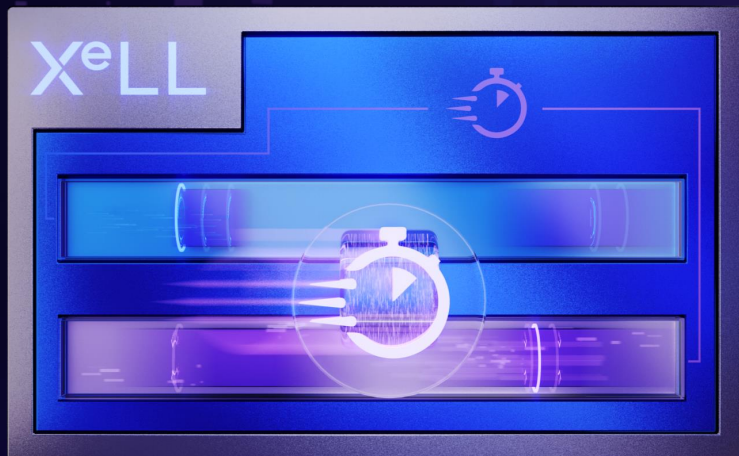


Latency Measurement Tool (LMT)



XeLL

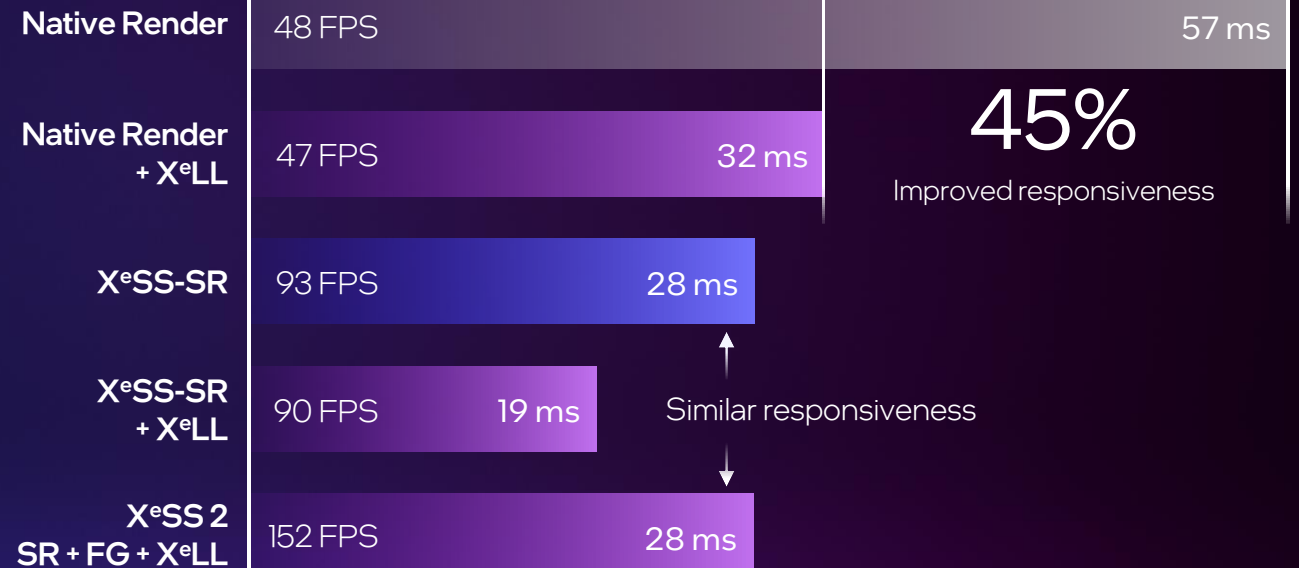
Near Instant Reaction



F1® 24 Gaming Responsiveness

Intel® Arc™ B580
Graphics Card

Display latency | Lower is better
1440p Ultra



Driver-based Low Latency Mode

intel Graphics Software

Home
Profiles
Graphics
Display
Performance

Graphics

Reset Settings

Frame Delivery

Frame Synchronization ?
Sets the method used for vertically syncing the rendered image to the display. **VSync Off**

FPS Limiter ?
Limits the rate at which frames are displayed. **On**

Target FPS: 30 — 300 **60**

Low Latency Mode ?
Improves the responsiveness between user input and graphics rendering for a better gaming experience.

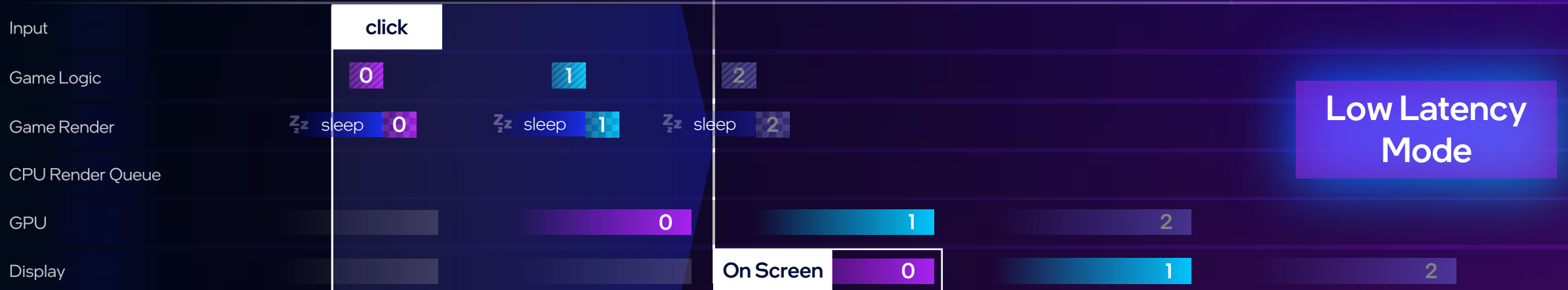
Off
On
On + Boost

Post-Processing
3D Rendering

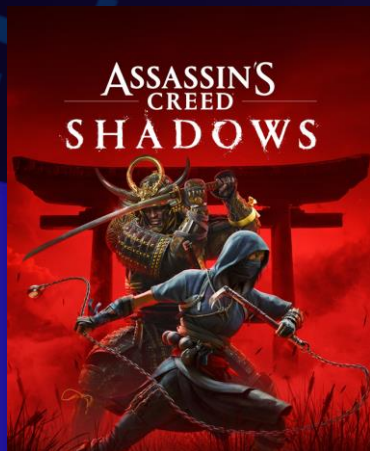
Driver Low Latency Mode

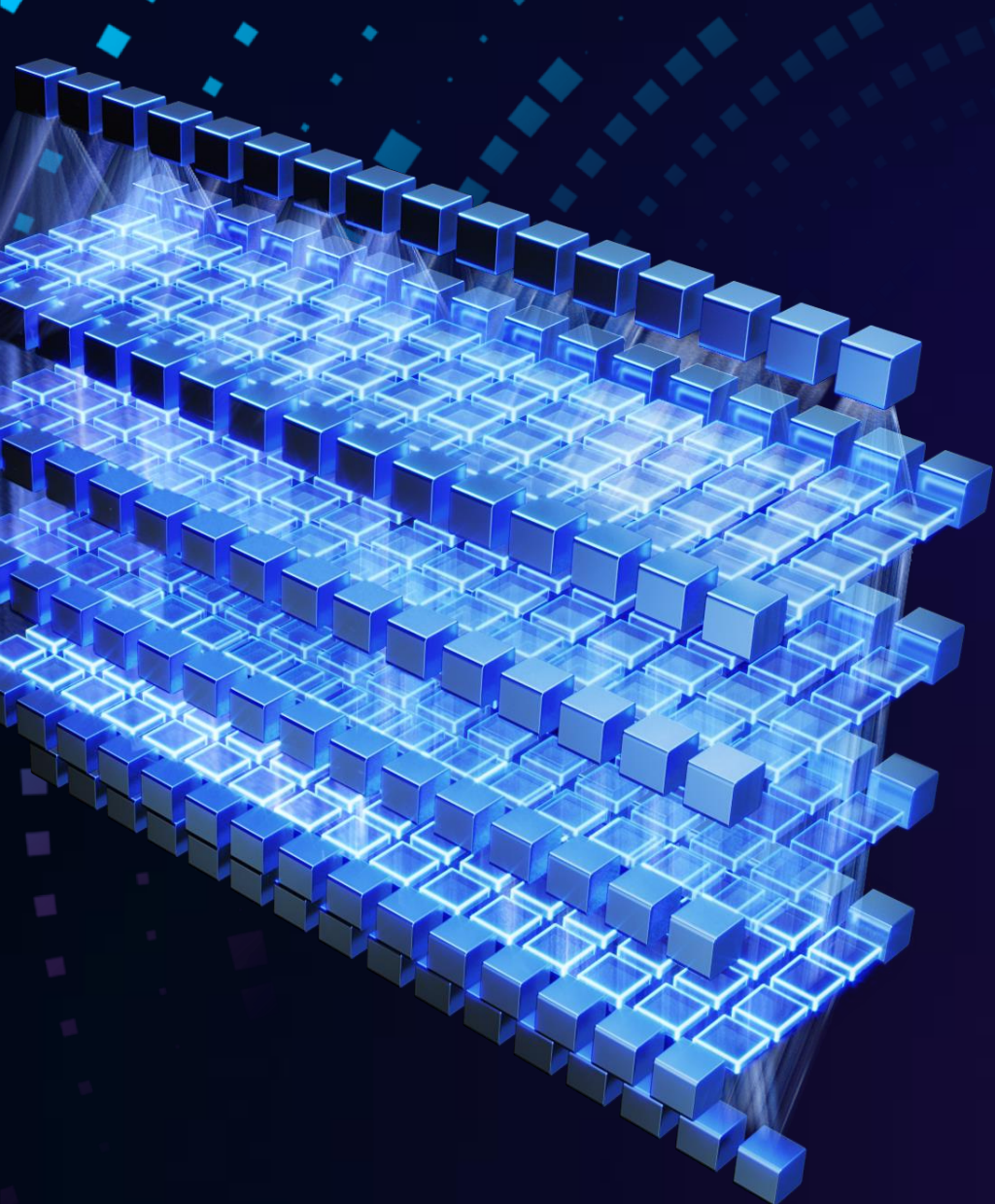


← Latency Reduction →

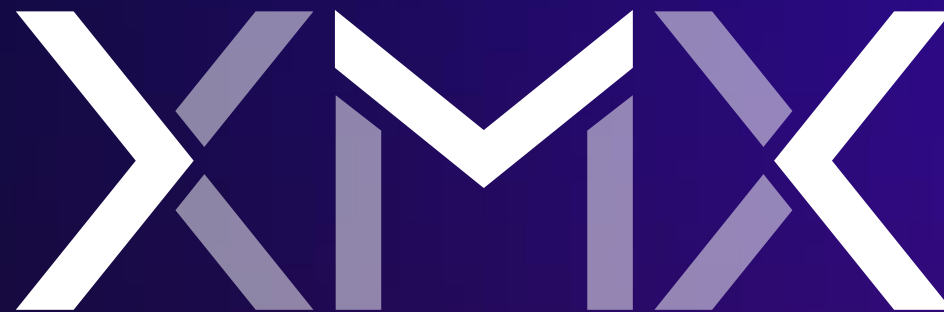


XeSS 2



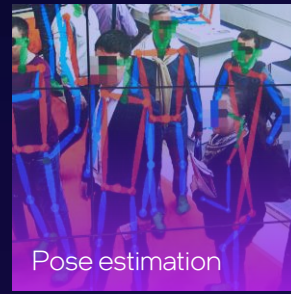


X^e Matrix Extensions

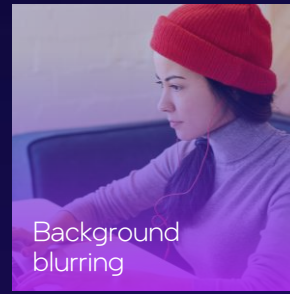


AI engines

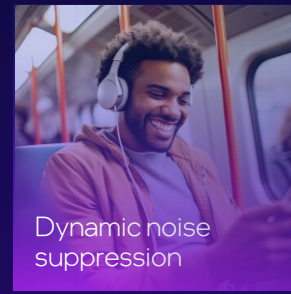
AI Client Workload Trends



Pose estimation



Background blurring



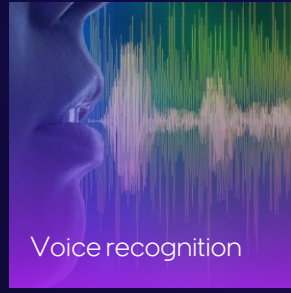
Dynamic noise suppression



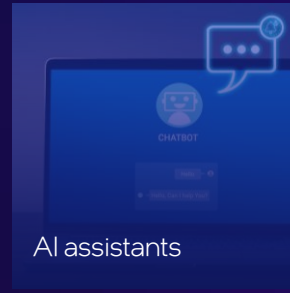
Chatbots



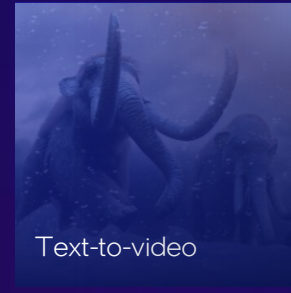
Meeting summarization



Voice recognition



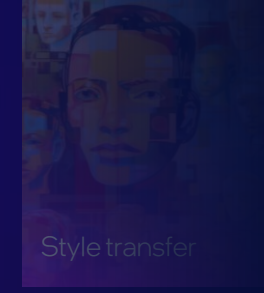
AI assistants



Text-to-video



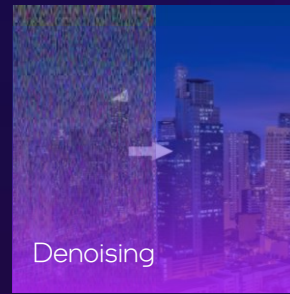
Depth estimation



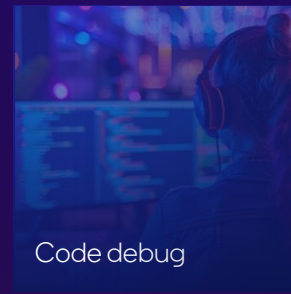
Style transfer



Recommendations



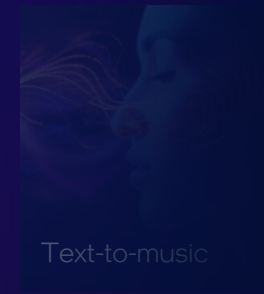
Denoising



Code debug



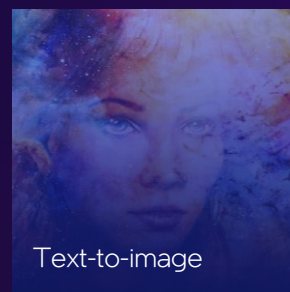
Identification



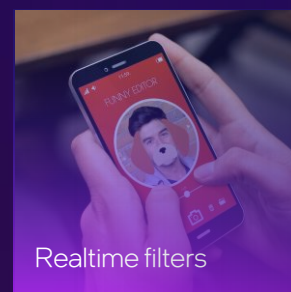
Text-to-music



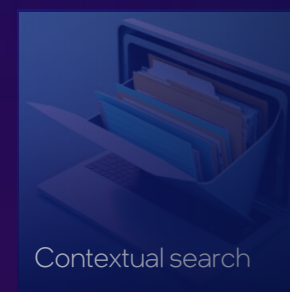
Code generation



Text-to-image



Realtime filters



Contextual search

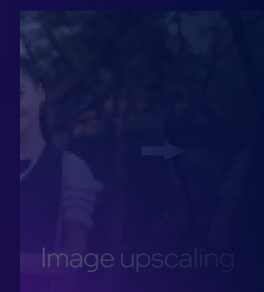


Image upscaling

Growing in diversity

From background blurring to gen AI

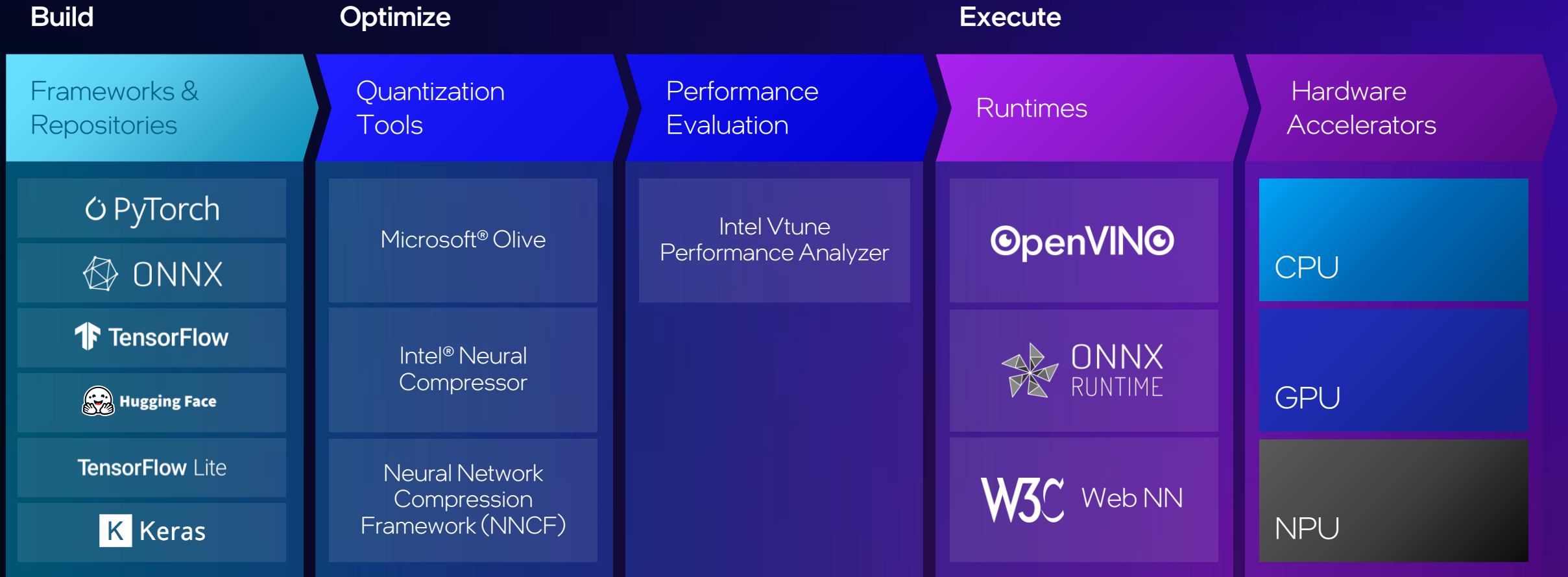
App & OS integration

from features in apps to OS co-pilots

Multi Modal

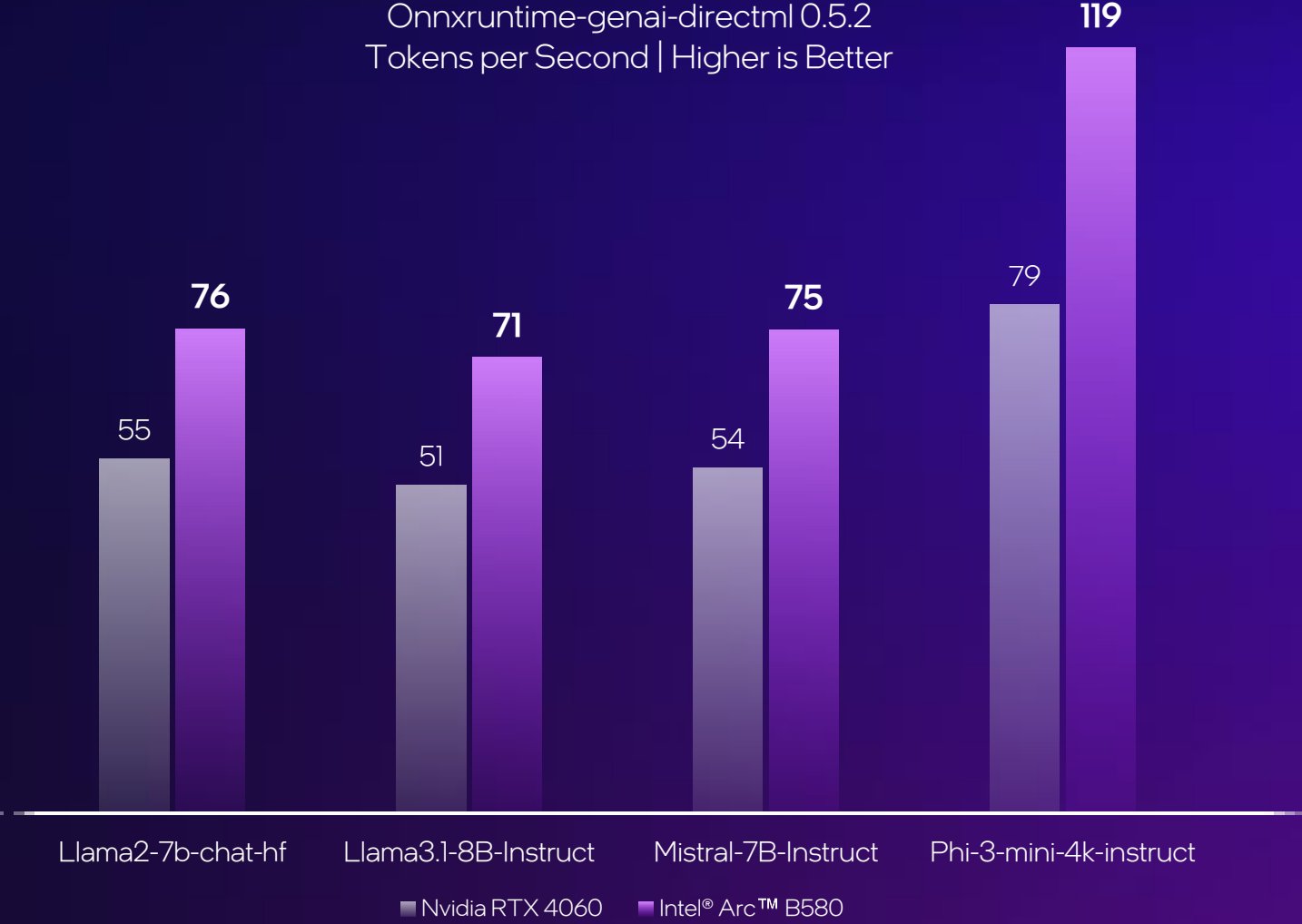
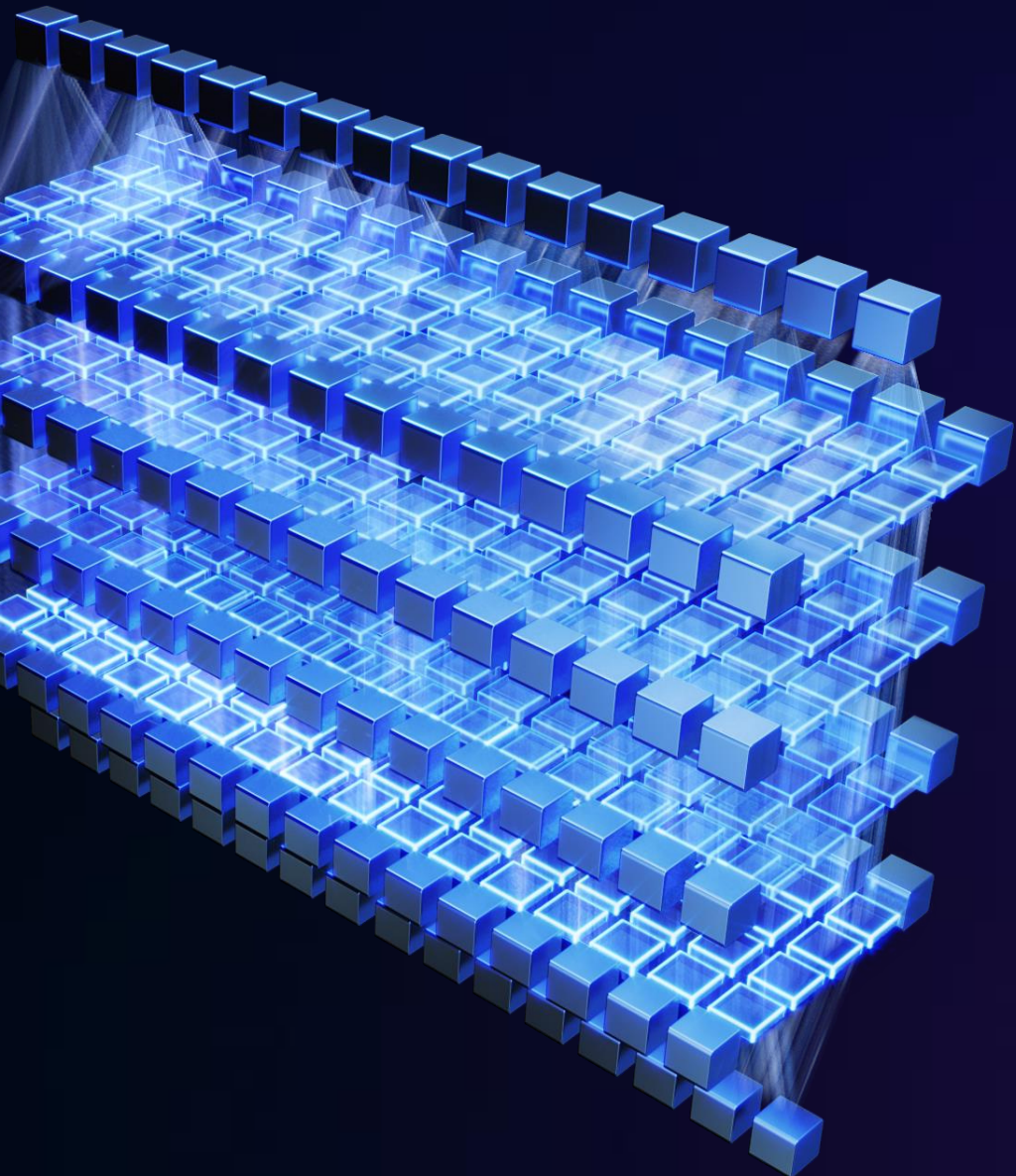
Transformers and diffusion

AI Enablement Flow

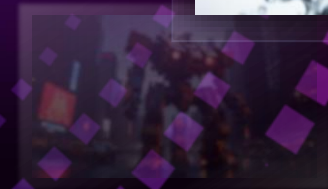
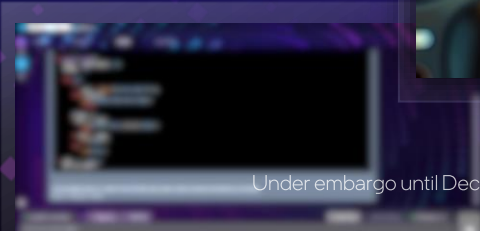
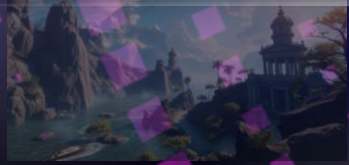
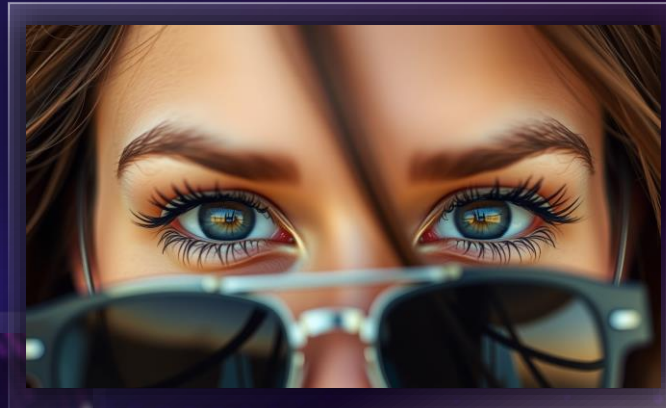
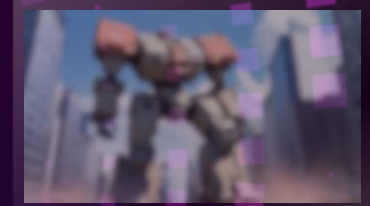
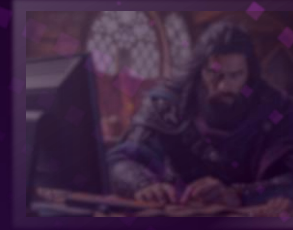
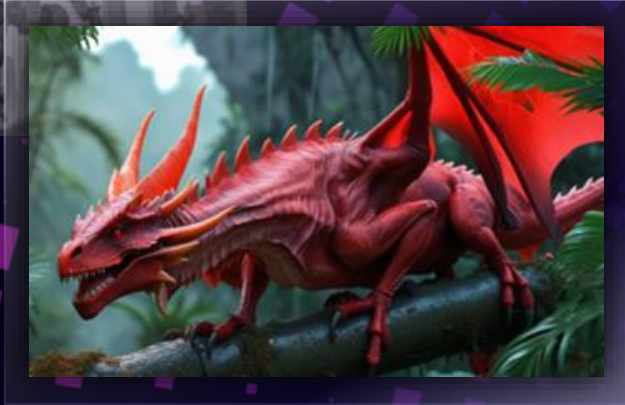


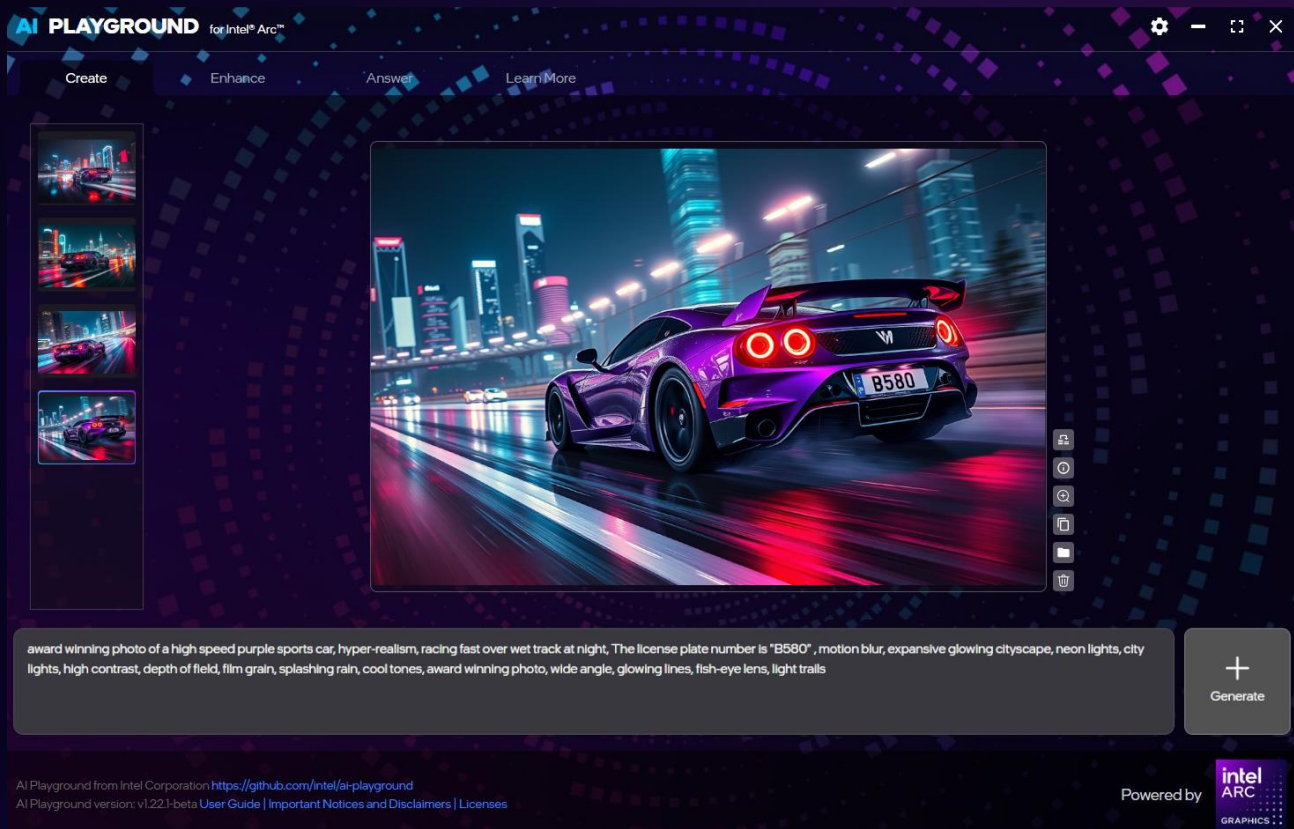
LLM Performance

Onnxruntime-genai-directml 0.5.2
Tokens per Second | Higher is Better



GENERATIVE AI





AI PLAYGROUND 2.0

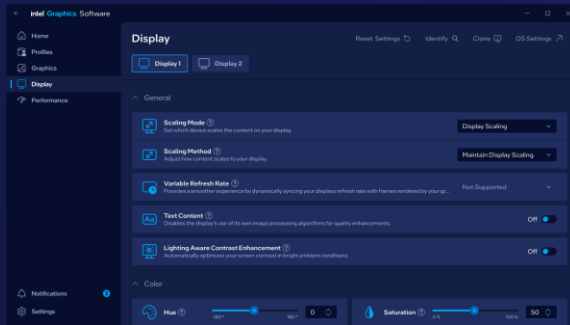
Local and accessible Gen AI for Intel Arc GPUs

<p>Create</p> <p>Stable Diffusion Image Generation</p>	<p>Enhance</p> <p>Upscale, Stylize, Inpaint/Outpaint</p>	<p>Answer</p> <p>AI Chat w RAG & History Context</p>	<p>Top Models</p> <p>Flux.1, SDXL, Phi3, etc..</p>
<p>HW Optimized</p> <p>XMV Engines</p>	<p>Simple UI & Install</p> <p>No CMD Lines</p>	<p>Workflow Mode</p> <p>ComfyUI Integration</p>	<p>Open Source</p> <p>free and open tool</p>

Intel[®] Arc[™] Graphics Software

New Intel Graphics Software

Intel Specific Display Settings



KEY FEATURES

Scaling Model

TOP REQUEST

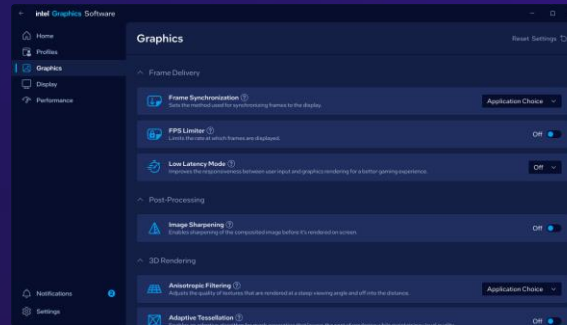
Scaling Method

TOP REQUEST

Quantization Range

TOP REQUEST

Intel 3D Graphics Settings

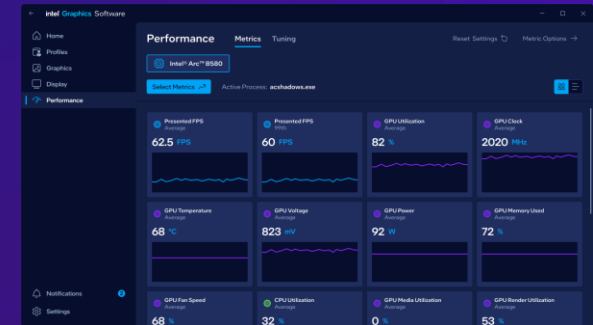


KEY FEATURES

FPS Limiter

Low Latency Mode

Performance Overclocking & Controls



KEY FEATURES

FPS Metric

TOP REQUEST

Voltage Limit

PresentMon Metrics

Frequency Offset

GPU Limit Indicator

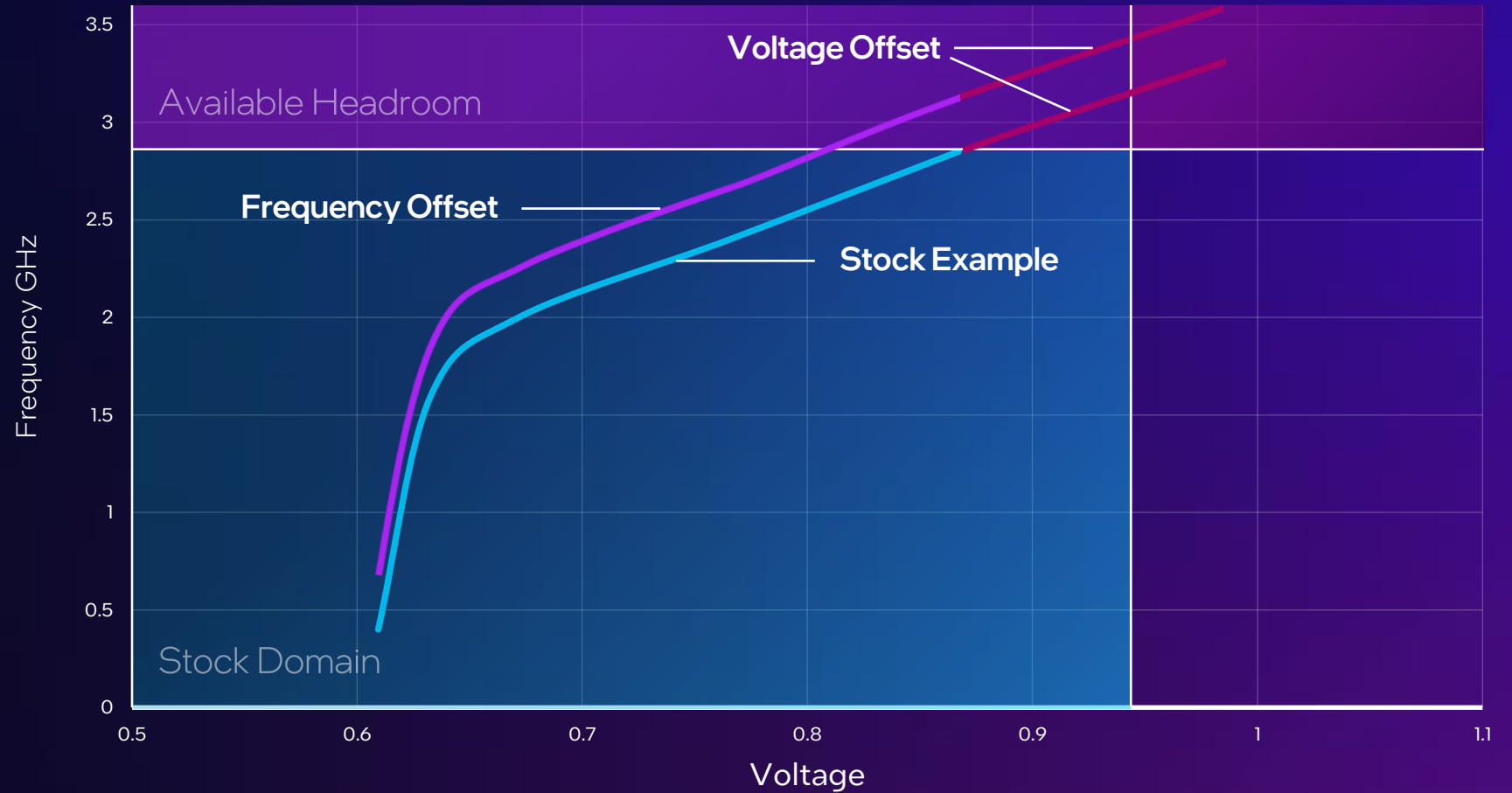
Memory Speed

Power Limit

VF Curve

Expanded Overclocking Capabilities

- Board Power Limit
- Memory Overclocking
- VF/Curve Customization
- Per Design Overclocking Limits



Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details. Visualization for illustrative purposes only.

Under embargo until December 3, 2024, at 6:00 AM Pacific Time

Overclocking Controls Directly in App

Basic and advanced modes, user-friendly no matter the skill level

The screenshot shows the 'Basic' mode of the Intel Arc Graphics Control Panel. The 'GPU Tuning' section is active, with 'Basic' selected. The 'Voltage Limit' is set to 0%, 'Power Limit' to 100%, and 'Frequency Offset' to 0MHz. The 'VRAM Tuning' section is also active, with 'Memory Speed' set to 19 Gbps. The 'Fan & Thermal Tuning' section is active, with 'Temperature Limit' set to 100% and 'Target Speed' set to 90%.

Performance Metrics **Tuning**

Intel(R) Arc(TM) B580 Graphics

Tuning Options Reset Tuning ↶

GPU Tuning Off **Basic** Advanced

Voltage Limit ?
Sets the voltage limit of the GPU. 0% 100% 0

Power Limit ?
Sets the power limit of the GPU. 50% 120% 100

Frequency Offset ?
Sets the frequency offset of the GPU. -300MHz 1000MHz 0

VRAM Tuning On

Memory Speed ?
Set the memory speed of the GPU. 19Gbps 22Gbps 19

Fan & Thermal Tuning Off **Basic** Advanced

Temperature Limit ?
Sets temperature limit of the GPU. 60% 100% 100

Target Speed ?
Sets the target fan speed of the GPU. 0% 100% 90

The screenshot shows the 'Advanced' mode of the Intel Arc Graphics Control Panel. The 'GPU Tuning' section is active, with 'Advanced' selected. The 'Voltage Limit' is set to 0%, 'Power Limit' to 100%, and 'Voltage-Frequency Curve' is visible. The 'Voltage-Frequency Curve' graph shows a blue line representing the relationship between voltage and frequency, starting at 400mV, 0MHz and ending at 1500mV, 4300MHz.

Performance Metrics **Tuning**

Intel(R) Arc(TM) B580 Graphics

Tuning Options Reset Tuning ↶

GPU Tuning Off Basic **Advanced**

Voltage Limit ?
Sets the voltage limit of the GPU. 0% 100% 0

Power Limit ?
Sets the power limit of the GPU. 50% 120% 100

Voltage-Frequency Curve ?
Sets the voltage-frequency curve of the GPU.

4300MHz

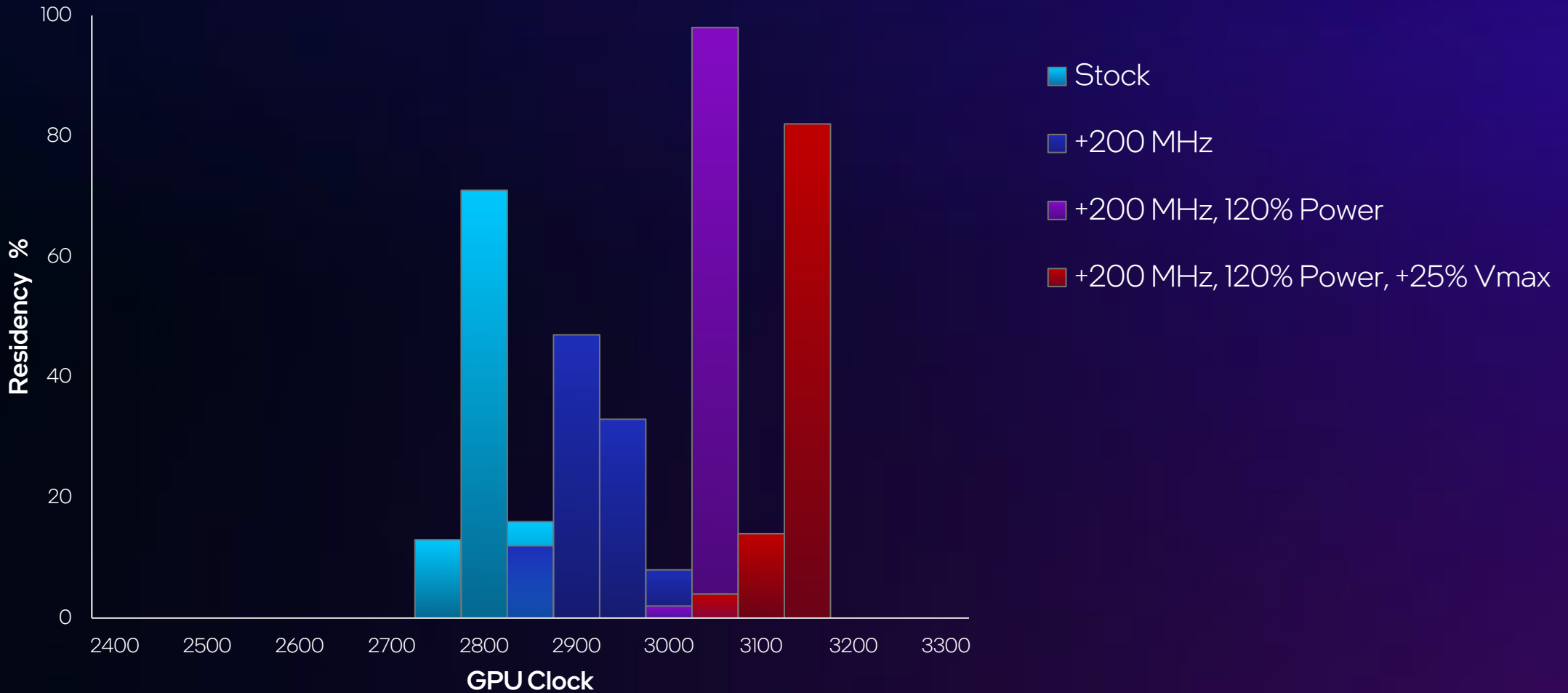
400mV, 0MHz 1500mV

Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details. Visualization for illustrative purposes only.

Under embargo until December 3, 2024, at 6:00 AM Pacific Time

GPU Clock Residency Example

Intel® Arc™ B580 Graphics Card



Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details. Visualization for illustrative purposes only.

Under embargo until December 3, 2024, at 6:00 AM Pacific Time



INTRODUCING

intel
ARC B580
Limited Edition

intel ARC B580 Limited Edition



Designed for

Higher Performance

Increased Air Flow

Whisper Quiet

*vs Intel Arc A770/A750 Limited Edition

Under embargo until December 3, 2024, at 6:00 AM Pacific Time

Performance varies by use, configuration, and other factors. See backup for details.



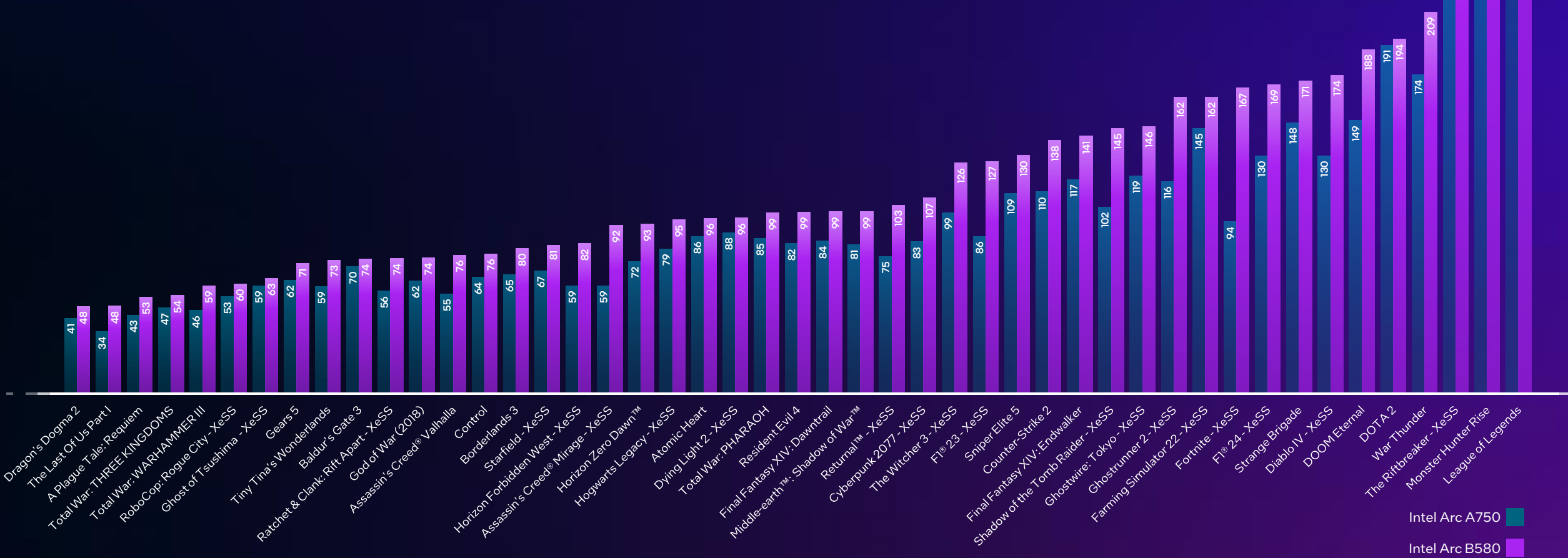
intel ARC™ B580	intel ARC™ B570	
20	18	Xe ^e - cores
5	5	Render Slices
20	18	Ray Tracing Units
160	144	XMV AI Engines
2670 MHz	2500 MHz	Graphics Clock
12 GB	10 GB	Memory
192 bit	160 bit	Memory Interface
456 GB/s	380 GB/s	Memory Bandwidth
233	203	Peak TOPs (int8 dense)
190 W	150 W	Total Board Power
1x 8-Pin		Power Connector
PCIe 4.0 x8		PCIe Configuration
AV1, HEVC, AVC, VP9, XAVC-H		HW Accelerated Media
3x DisplayPort 2.1 (up to UHBR 13.5) 1x HDMI 2.1		Display Configuration

intel ARC B580

24% faster

on average than Intel Arc A750 Limited Edition

1440p Ultra Gaming | FPS | Higher is Better



Intel Arc A750
Intel Arc B580



Under embargo until December 3, 2024, at 6:00 AM Pacific Time

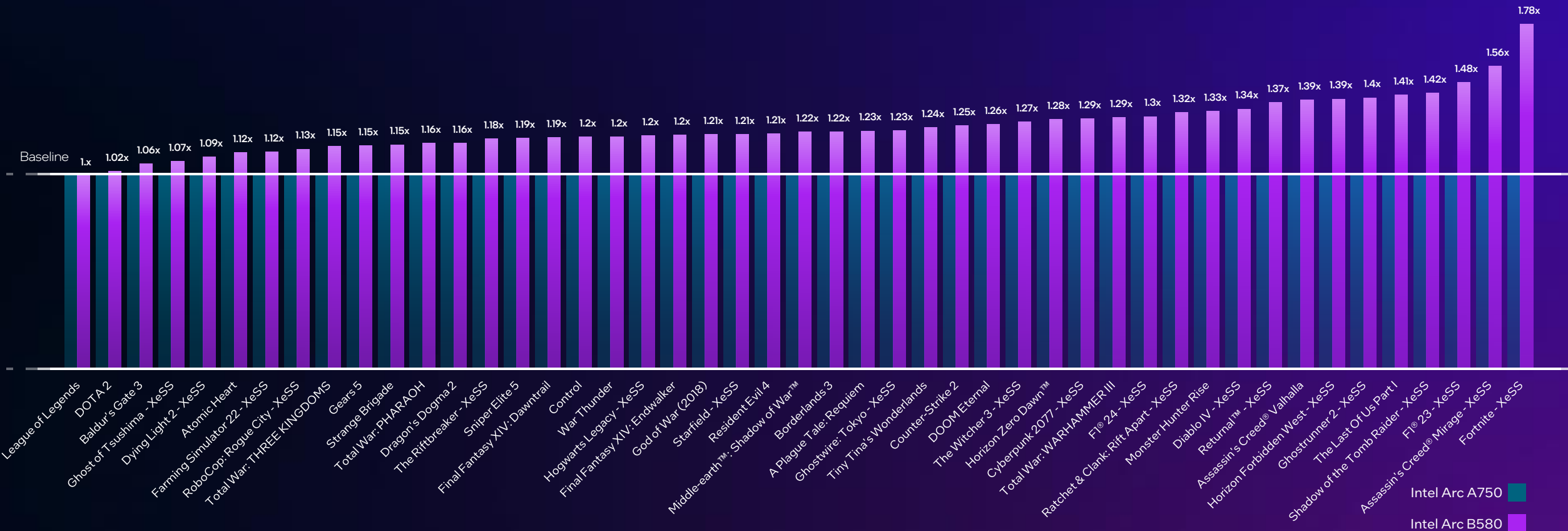
Performance varies by use, configuration, and other factors. See backup for details.

intel ARC B580

24% faster

on average than Intel Arc A750 Limited Edition

1440p Ultra Gaming | Relative Performance | Higher is Better



The Modern Gaming Experience

More Realistic
Lighting



Highly Detailed
Graphics



1440p Ultra
Gaming



Unlock the Latest Features in Modern Games

1440p Ultra Gaming | 39 game average Raster

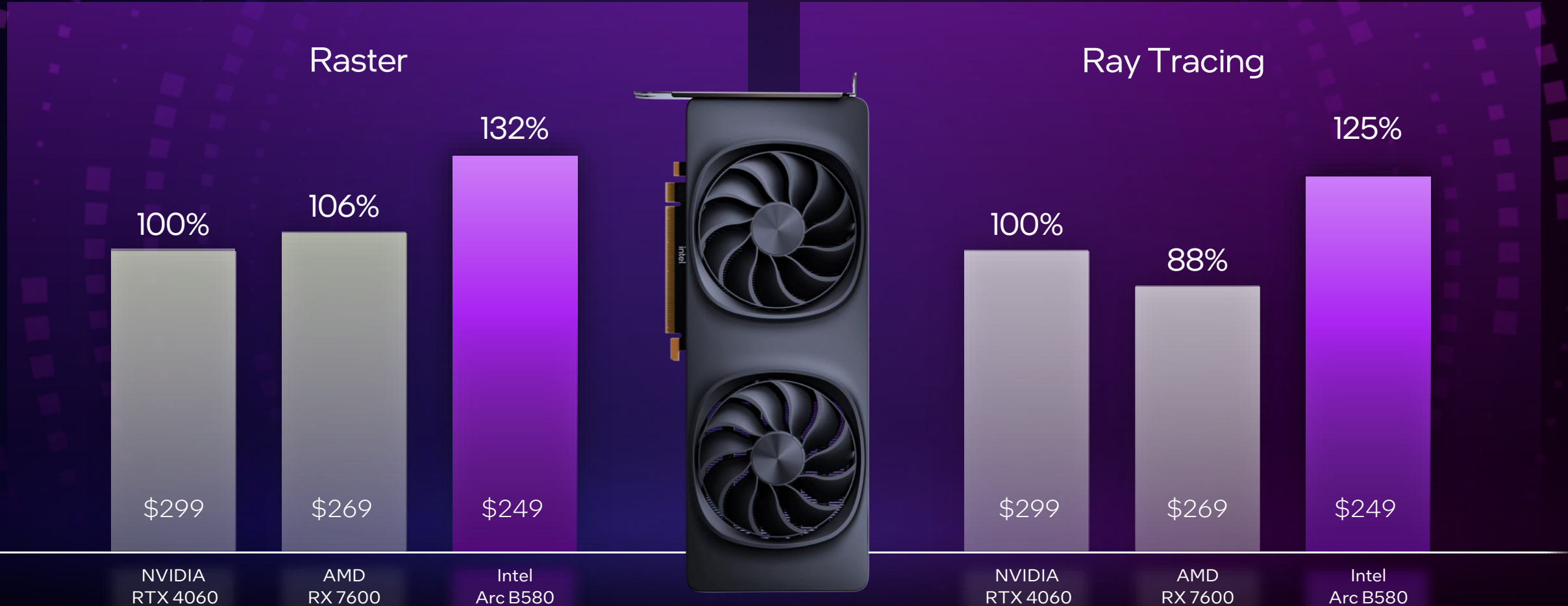
Raster

Ray Tracing



Best-in-Class Performance per Dollar

1440p Ultra Gaming | 47 game average Raster | 9 game average RT | MSRP Launch Price

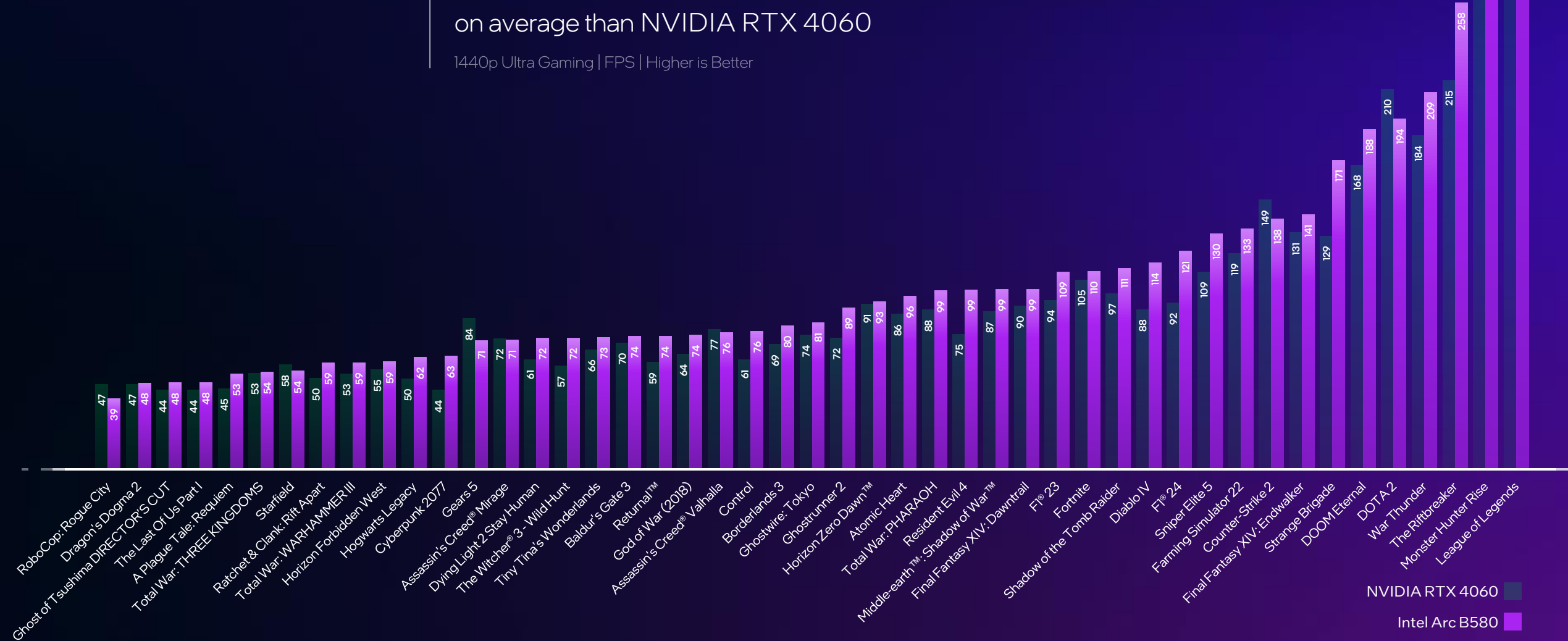


intel ARC B580

10% faster

on average than NVIDIA RTX 4060

1440p Ultra Gaming | FPS | Higher is Better



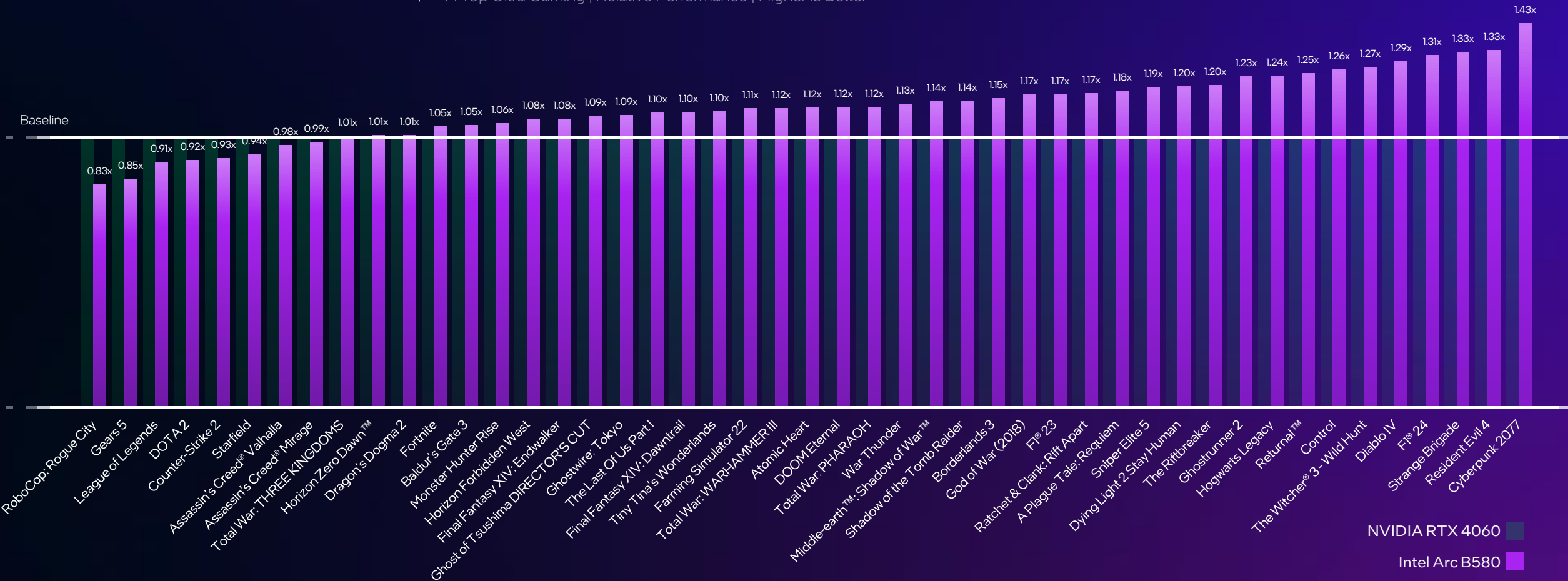
NVIDIA RTX 4060
Intel Arc B580

intel
ARC B580

10% faster

on average than NVIDIA RTX 4060

1440p Ultra Gaming | Relative Performance | Higher is Better

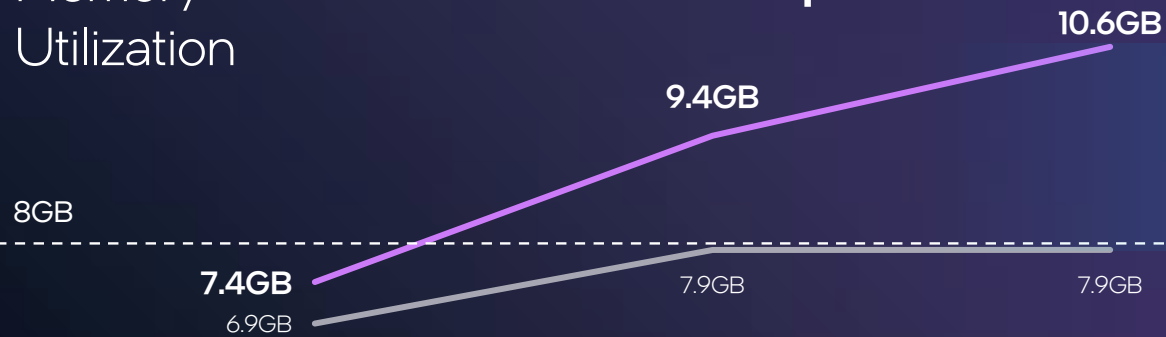


NVIDIA RTX 4060
Intel Arc B580

10 GB+ for High Quality 1440p Gaming

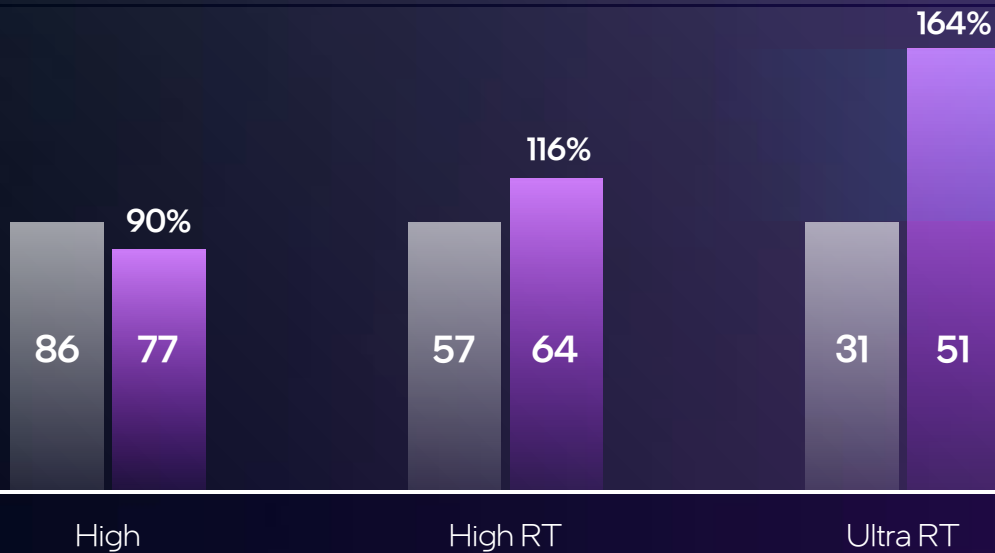
Memory Utilization

Forza Motorsport



2.7 GB Additional memory demands from game

FPS



+64% More performance

■ Nvidia RTX 4060 ■ Intel Arc B580

intel ARC B-Series

acer

NITRO



ASRock

STEEL
LEGEND



CHALLENGER

GUNNIR

PHOTON



INDEX

MAXSUN

I-CRAFT



MILESTONE

ONIX

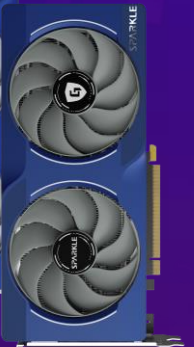
LUMI



ODYSSEY

SPARKLE

TITAN



GUARDIAN

intel ARC B-Series



x^eSS²

Modern Gaming
Features



Best-in-Class
Performance per Dollar



AI
Acceleration

intel ARC B580

Starting at
\$249 USD

Available
Dec 13th '24

intel ARC B570

Available
Jan 16th '25

Starting at
\$219 USD



Under embargo until December 3, 2024, at 6:00 AM Pacific Time

Workloads and Configurations

All games tested at 1440p Ultra settings, with select games using XeSS performance mode (if available), unless otherwise stated.

Results are the median of 3 runs.

Testing as of November 2024.

GPU Tested	Driver Version
Intel® Arc™ B580 Limited Edition	101.6239
Intel® Arc™ A750 Limited Edition	101.6130
NVIDIA GeForce GTX 1060 6GB	566.03
NVIDIA GeForce GTX 1660 SUPER 6GB	566.03
NVIDIA GeForce RTX 4060 8GB	566.03
AMD Radeon RX 7600 8GB	24.10.1

Motherboard	ROG MAXIMUS Z790 HERO
BIOS Version	2703
CPU	Intel® Core™ i9 processor 14900K
VBS	VBS ON
Resizable BAR	Enabled
Memory Profile	XMP1
Memory Model	Corsair DOMINATOR PLATINUM RGB DDR5 32GB (2x16GB) 5600MHz C36
Storage	Corsair MP600 PRO XT
Operating System	Windows 11 Pro - 10.0.22631 Build 26100.2033
Defender	Enabled
Vt-d	Enabled
Power Supply Model	Corsair RMX Series (2021), RM1000x, 1000 Watt
Power Plan	High performance



intel
ARC

GRAPHICS