

# Powering Professional Compute Demands

Intel<sup>®</sup> Xeon<sup>®</sup> W-3400 and Intel<sup>®</sup> Xeon<sup>®</sup> W-2400  
Workstation Processors

February 1st, 2023

# Notices and Disclaimers

- Performance varies by use, configuration and other factors. Learn more at [www.Intel.com/PerformanceIndex](http://www.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.
- Results that are based on systems and components as well as results that have been estimated or simulated using an Intel Reference Platform (an internal example new system), internal Intel analysis or architecture simulation or modeling are provided to you for informational purposes only. Results may vary based on future changes to any systems, components, specifications or configurations.
- Intel technologies may require enabled hardware, software or service activation. Contact your Intel representative for the latest information
- 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.
- Your costs and results may vary.
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# Introducing Intel® Xeon® W Processors

Roger Chandler

VP, Client Computing Group (CCG)

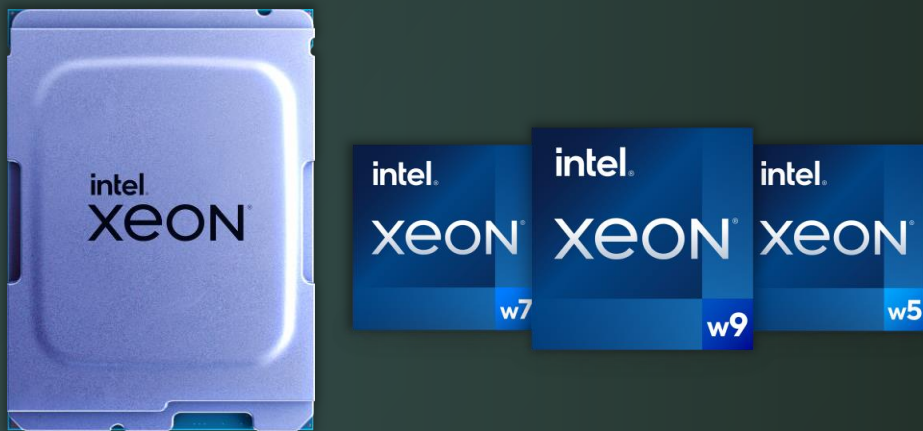
General Manager of Creator and Workstation Solutions



# Introducing Intel® Xeon® W Processors

## Expert Workstation

350W



Intel® Xeon® W-3400 Processors

## Mainstream Workstation

225W



Intel® Xeon® W-2400 Processors

# Professionals Drive Innovations



Media &  
Entertainment



Engineering



Life  
Sciences



Energy &  
Geo-Sciences



Financial  
Services



Data Science &  
AI Development



# Ensuring the Best Experience for Professionals

## Intel Enabling Investment

Workstation Segment  
Teams / Segment  
Focused Workflows

Performance  
Testing

Workflow Enabling  
and Testing

Compilers and  
Tool Kits



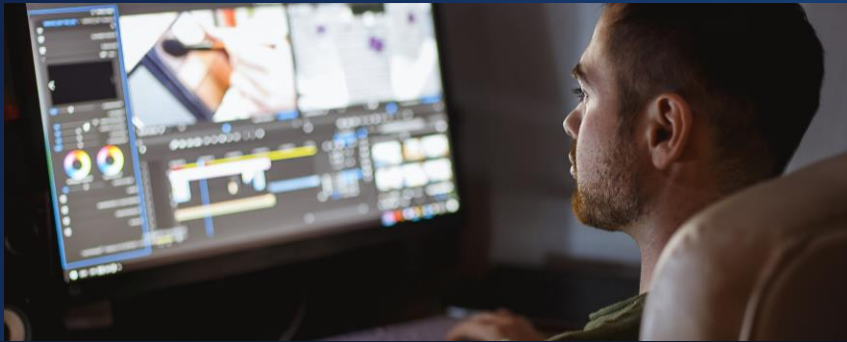
## ISV Alliance Management



## Optimized Unique Experiences



# Intel Powers Those Professionals



## Media & Entertainment

- 3D Scene Creation
- Video Effects (VFX)
- Game Development



## Engineering (CAD, CAE, Simulation, AEC)

- Product Design
- Architectural Design
- Product Engineering and Analysis
- Product Visualization



## Scientific Computing and Artificial Intelligence Development

- Data Science
- Scientific Computing
- Machine Learning/Deep Learning



# Intel® Xeon® W-3400 processors deliver **The Ultimate Workstation Solution**<sup>1</sup>

Breakthrough New Compute Architecture

Designed for Professionals Creators,  
Engineers, and Scientists

Latest Platform Technologies



Intel® Xeon® W-3400 Processors



Intel® Xeon® W-2400 Processors



## Processor Cores

Up to 56 Cores  
Intel® Xeon® W-3400 Processors

Up to 24 cores  
Intel® Xeon® W-2400 Processors

## Processor

Intel® Turbo Boost Max Technology 3.0  
up to 4.8Ghz of CPU frequency

Intel® Smart Cache  
up to 105MB

3<sup>rd</sup> Gen Intel® Deep Learning Boost  
AVX-512 support

Advanced Matrix Extensions (AMX)  
INT8 and BFloat 16 datatypes

## Memory

Memory Support  
DDR5 ECC RDIMM  
up to 4800Mt/s

Memory Capacity  
up to 4TB

Memory Channels  
up to 8 channels

## Platform

Intel® W790 Chipset

System Expansion  
up to 112 CPU PCIe 5.0 lanes

Network Connectivity  
integrated Intel® Wi-Fi 6E (Gig+)

Intel vPro® Enterprise Technologies  
for Hardware-based Security and System Manageability

Expansion Connectivity  
increased bandwidth to chipset  
x8 DMI 4.0



Flexible Pixel Powerhouse



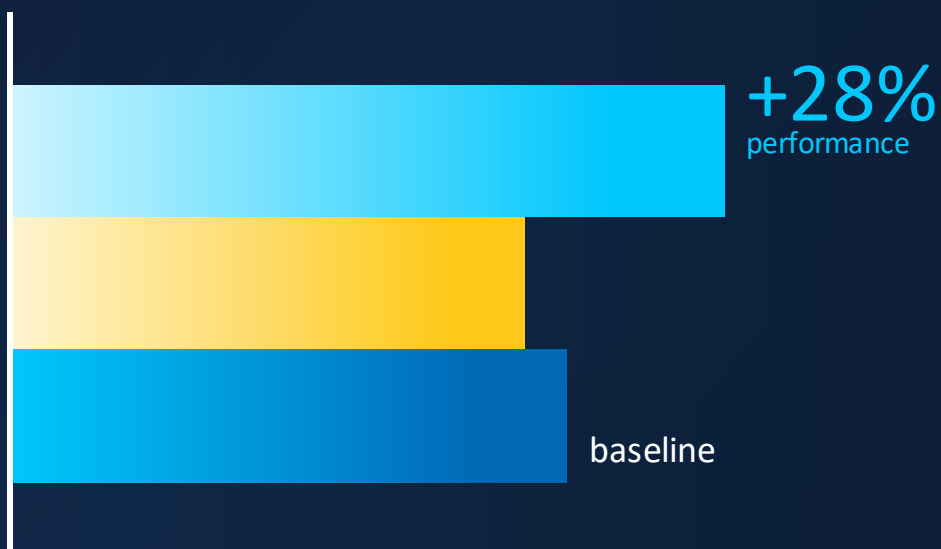
# Giant Leap in Performance

Intel® Xeon® W-3400 and Intel® Xeon® W-2400 Processors



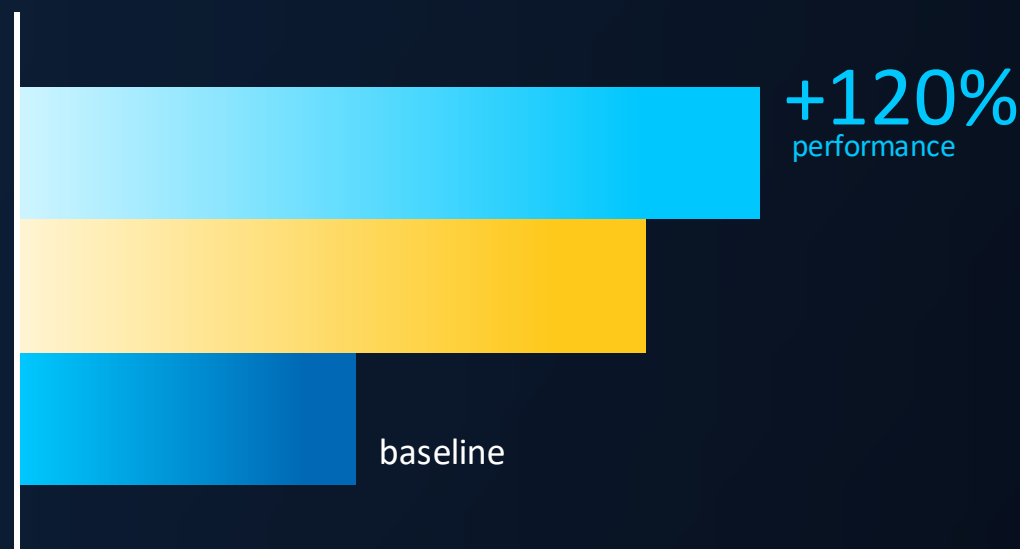
## Single Thread Performance<sup>2</sup>

SPECrate®2017\_int\_base (1 copy)



## Multi-Tasking Performance<sup>3</sup>

SPECrate®2017\_int\_base (n copy)



Intel® Xeon® w9-3495X (1x56c)

2x Intel® Xeon® Gold 6258R (2x 28c)

Intel® Xeon® W-3275 (1x28c)

2. As estimated by measurements made using SPECrate2017\_int\_base 2017 (1-copy) using Intel validation platform comparing Intel Xeon w9-3495X versus Intel® Xeon® W-3275

3. As estimated by measurements made using SPECrate2017\_int\_base 2017 (n-copy) using Intel validation platform comparing Intel Xeon w9-3495X versus Intel® Xeon® W-3275

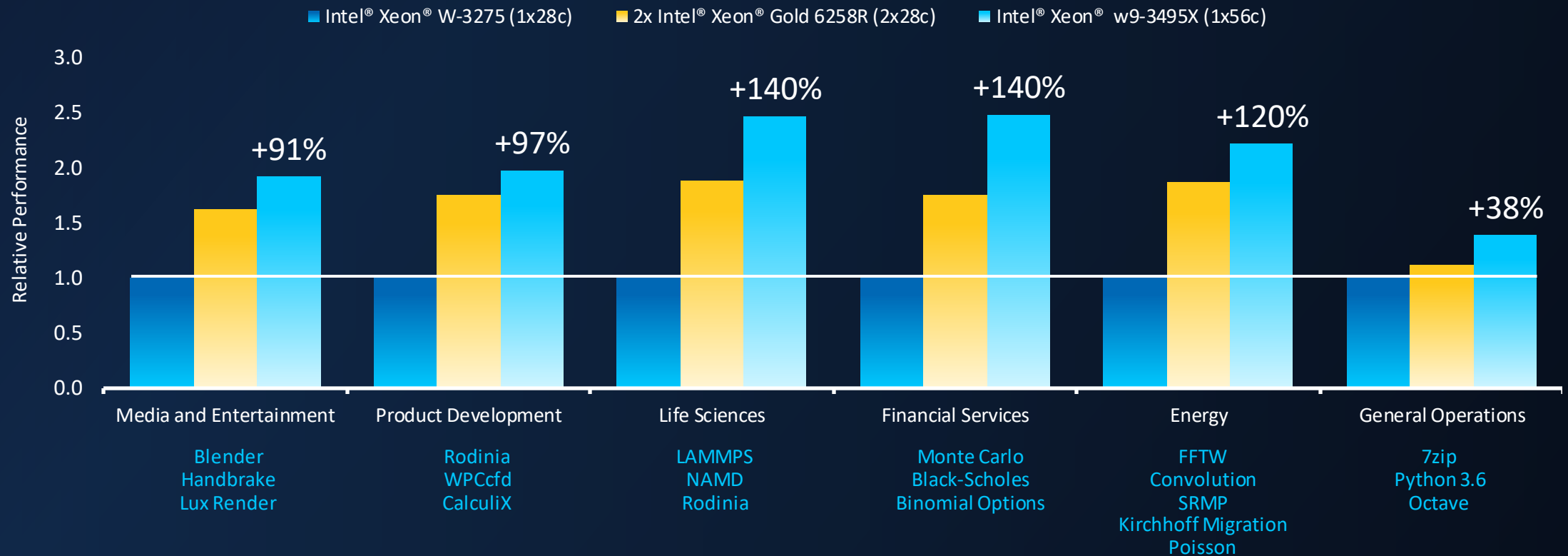
See [intel.com/performanceindex](https://www.intel.com/performanceindex) for configuration details. Results may vary.



# Giant Leap in Performance

Intel® Xeon® W-3400 and Intel® Xeon® W-2400 Processors

## SPECworkstation 3.1



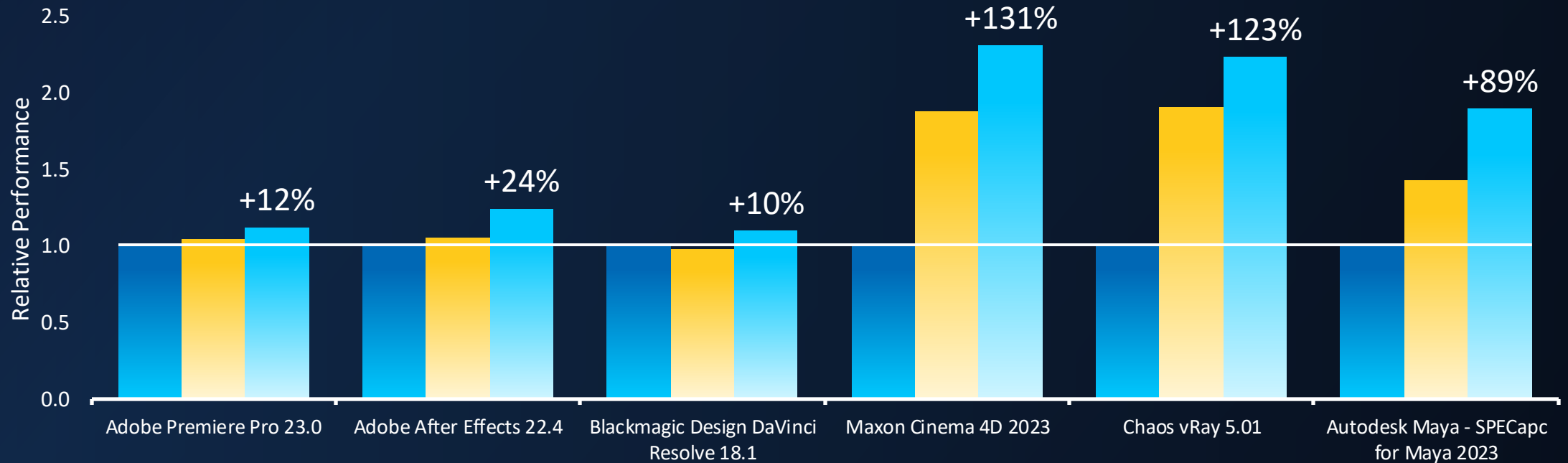


# Smooth Content Creation Workflows

Intel® Xeon® W-3400 and Intel® Xeon® W-2400 Processors

## Media and Entertainment Applications

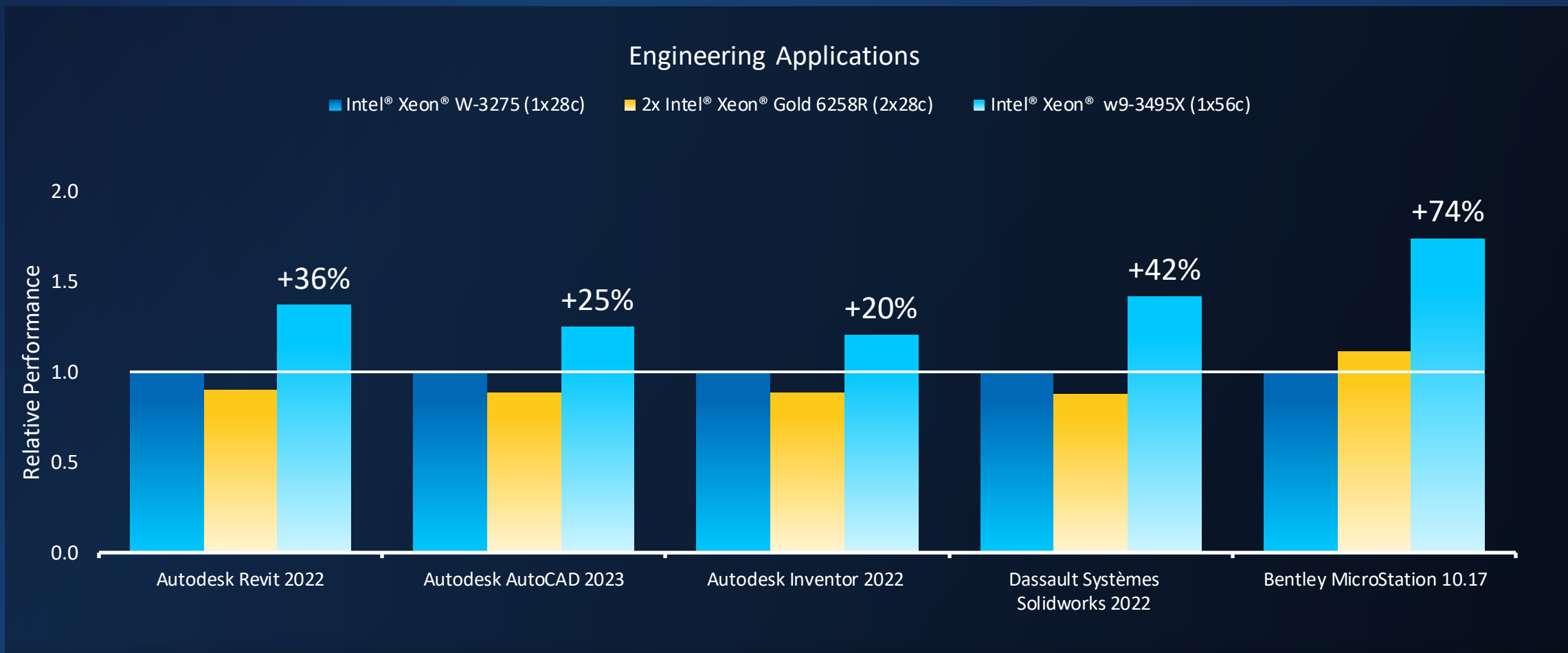
■ Intel® Xeon® W-3275 (1x28c)   ■ 2x Intel® Xeon® Gold 6258R (2x28c)   ■ Intel® Xeon® w9-3495X (1x56c)





# Quicker Modeling, Simulation, and Visualization

Intel® Xeon® W-3400 and Intel® Xeon® W-2400 Processors

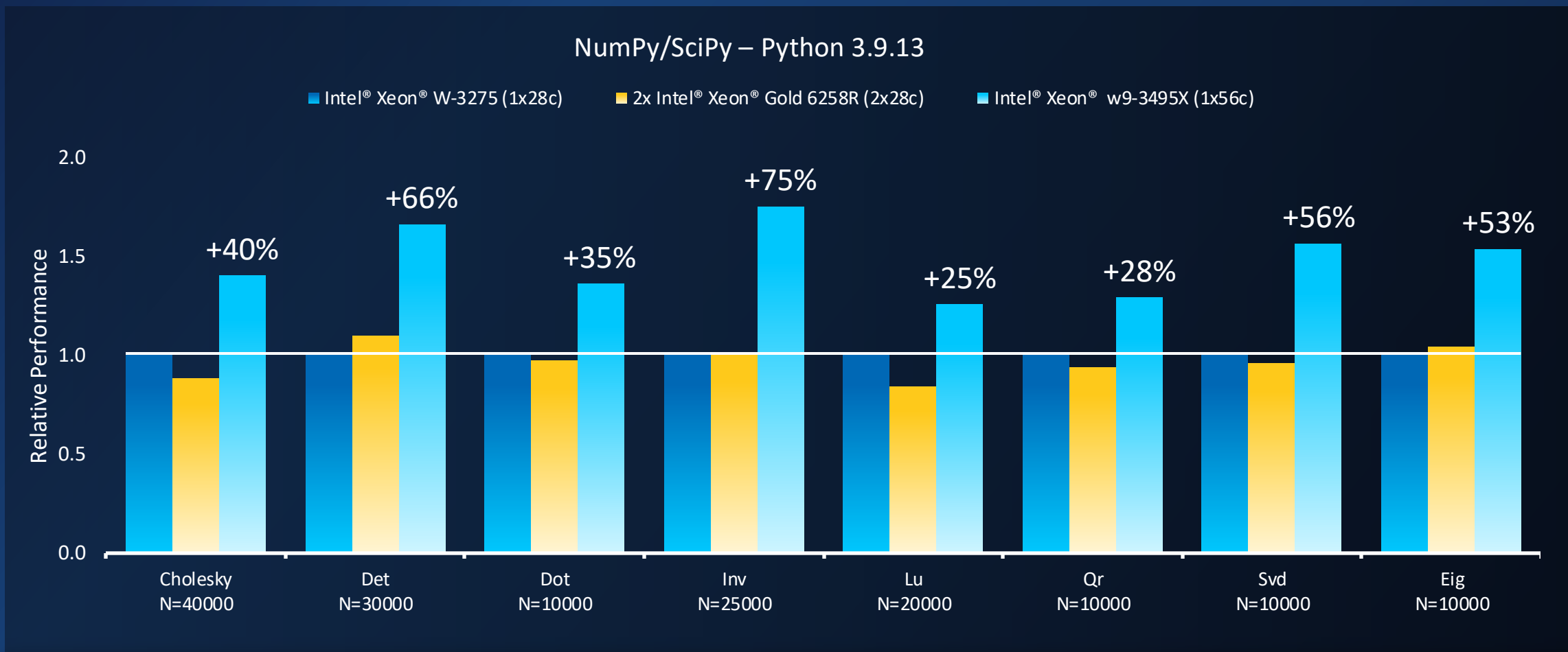


6. As estimated by measurements made using Intel validation platform comparing Intel Xeon w9-3495X versus Intel® Xeon® W-3275. See [intel.com/performanceindex](https://www.intel.com/performanceindex) for configuration details. Results may vary.



# Faster Data Science Compute

Intel® Xeon® W-3400 and Intel® Xeon® W-2400 Processors



# Intel® Xeon® W Processors Details

Zac Kranich

Workstation Platform Manager  
Desktop, Workstation and Channel Group



# Intel Workstation Platforms



## Mobile and Entry

H, HX-Series and S-Series (65W/125W)

Intel® Core™ Processors for Workstations\*



## Mainstream

Intel® Xeon® W-2400 Processors (225W)



## Expert





Intel® Xeon® W-3400 Processors (350W)

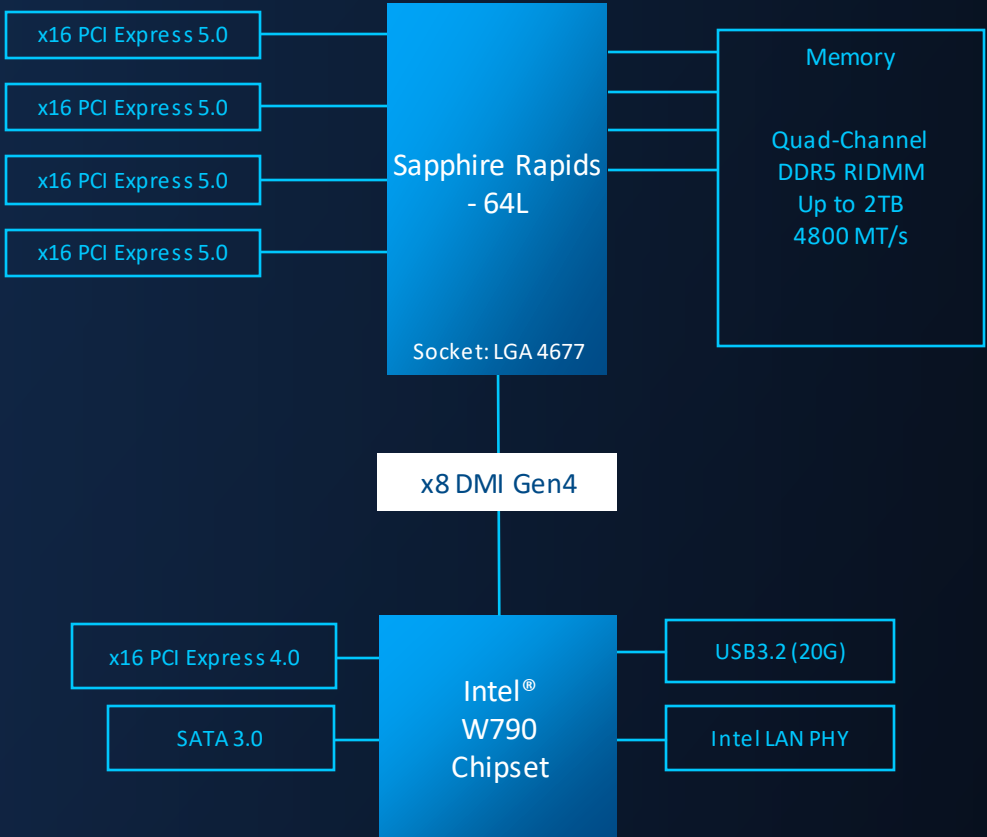


\* ECC Memory available on select CPU SKUs when paired with the W680 PCH or on the mobile HX SKU. ECC routing supported in 4L for all DDR4 and DDR5 configurations.



# Introducing Intel® Xeon® W-2400 Processors

Brand Levels	Intel® Xeon® W-2400 Processors
	
	Up to 24 cores Unlocked <sup>1</sup>
	Up to 16 cores DDR5-4800 Unlocked <sup>1</sup>
	Up to 8 cores Quad-Channel Memory DDR5-4400 x64 Lanes of CPU PCIe Gen 5.0







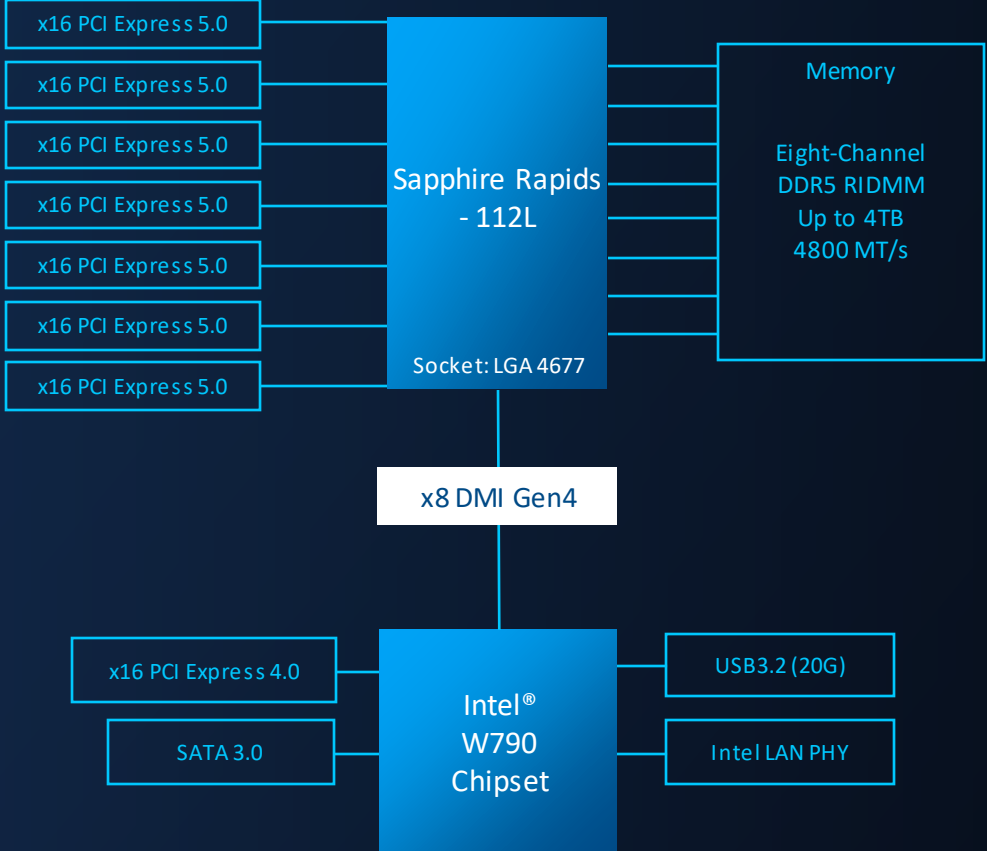
```
graph TD; Processor[Sapphire Rapids - 64L  
Socket: LGA 4677] --- DMI[x8 DMI Gen4]; DMI --- Chipset[Intel® W790 Chipset]; Processor --- PCI5[x16 PCI Express 5.0]; Processor --- PCI5_2[x16 PCI Express 5.0]; Processor --- PCI5_3[x16 PCI Express 5.0]; Processor --- PCI5_4[x16 PCI Express 5.0]; Processor --- Memory[Memory  
Quad-Channel DDR5 RIDMM  
Up to 2TB  
4800 MT/s]; Chipset --- PCI4[x16 PCI Express 4.0]; Chipset --- SATA[SATA 3.0]; Chipset --- USB[USB3.2 (20G)]; Chipset --- LAN[Intel LAN PHY];
```

Additional features as you move up the SKU Stack

1. On Select SKUs, delineated with an "X"

# Introducing Intel® Xeon® W-3400 Processors

Brand Levels	Intel® Xeon® W-3400 Processors
	Up to 56 cores Unlocked <sup>1</sup>
	Up to 28 cores Unlocked <sup>1</sup>
	Up to 16 cores Unlocked <sup>1</sup> Eight-Channel Memory x112 lanes of CPU PCIe Gen 5.0
	



The diagram illustrates the system architecture. At the top, the **Sapphire Rapids - 112L** processor is connected to **8x16 PCI Express 5.0** slots and **Memory** (Eight-Channel DDR5 RDIMM, Up to 4TB, 4800 MT/s). The processor is connected to the **Intel® W790 Chipset** via **x8 DMI Gen4**. The chipset is connected to **2x16 PCI Express 4.0** slots, **SATA 3.0**, **USB3.2 (20G)**, and **Intel LAN PHY**. The processor socket is **LGA 4677**.

Additional features as you move up the SKU Stack

1. On Select SKUs, delineated with an "X"

# Intel® Xeon® W Processor Lineup

## Brand Levels

### Intel® Xeon® W-3400 Processors

Expert Platform – 112L PCIe Gen 5.0

### Intel® Xeon® W-2400 Processors

Mainstream Platform – 64L PCIe Gen 5.0



Intel® Xeon® w9-3495X processor (56 Core)

Intel® Xeon® w9-3475X processor (36 Core)



Intel® Xeon® w7-3465X processor (28 Core)

Intel® Xeon® w7-3455 processor (24 Core)

Intel® Xeon® w7-3445 processor (20 Core)

Intel® Xeon® w7-2495X processor (24 Core)

Intel® Xeon® w7-2475X processor (20 Core)



Intel® Xeon® w5-3435X processor (16 Core)

Intel® Xeon® w5-3425 processor (12 Core)

Intel® Xeon® w5-2465X processor (16 Core)

Intel® Xeon® w5-2455X processor (12 Core)

Intel® Xeon® w5-2445 processor (10 Core)



Intel® Xeon® w3-2435 processor (8 Core)

Intel® Xeon® w3-2425 processor (6 Core)

Intel® Xeon® w3-2423 processor (6 Core)

# Intel® Xeon® W-3400 Processors - SKU Table

Processor Number	Processor Cores / Threads	Intel® Smart Cache (L3)	Intel® Turbo Boost Max Technology 3.0 Frequency (GHz)	Intel® Turbo Boost Technology Maximum Single Core Turbo Frequency (GHz)	Processor Base Frequency (GHz)	Unlocked <sup>1</sup>	CPU PCIe Lanes	Memory Support:				Reliability, Availability & Serviceability	Intel Technologies				
								Maximum Memory Speed (MT/s) <sup>2</sup>	Memory Channels	Maximum Memory Capacity <sup>2</sup>	Processor Base Power (W)		Intel vPro <sup>®3</sup>	Intel® ISM <sup>3</sup>	Boxed	RCP (1Ku)	
intel. <b>XEON</b> w9	w9-3495X	56/112	105MB	4.8	4.6	1.9	✓	112	DDR5 4800	8	4TB	350	ECC, Standard RAS	✓	✓		\$5889
	w9-3475X	36/72	82.5MB	4.8	4.6	2.2	✓	112	DDR5 4800	8	4TB	300	ECC, Standard RAS	✓	✓	✓	\$3739
intel. <b>XEON</b> w7	w7-3465X	28/56	75MB	4.8	4.6	2.5	✓	112	DDR5 4800	8	4TB	300	ECC, Standard RAS	✓	✓	✓	\$2889
	w7-3455	24/48	67.5MB	4.8	4.6	2.5		112	DDR5 4800	8	4TB	270	ECC, Standard RAS	✓	✓		\$2489
	w7-3445	20/40	52.5MB	4.8	4.6	2.6		112	DDR5 4800	8	4TB	270	ECC, Standard RAS	✓	✓		\$1989
intel. <b>XEON</b> w5	w5-3435X	16/32	45MB	4.7	4.5	3.1	✓	112	DDR5 4800	8	4TB	270	ECC, Standard RAS	✓	✓	✓	\$1589
	w5-3425	12/24	30MB	4.6	4.4	3.2		112	DDR5 4800	8	4TB	270	ECC, Standard RAS	✓	✓		\$1189

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

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDECJ-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

1. Unlocked features for performance tuning. See notices and disclaimers

2. Maximum memory speeds are associated with 1 DIMM per Channel (1DPC) configurations. Additional DIMM loading on any channel may impact maximum memory speed. Maximum memory capacity is achievable with 2DPC configurations.

3. All versions of the Intel vPro® platform require an eligible Intel® Core™ or Intel® Xeon® W processor, a supported operating system, Intel LAN and/or WLAN silicon, firmware enhancements, and other hardware and software necessary to deliver the manageability use cases, security features, system performance and stability that define the platform. See [intel.com/performance-vpro](https://www.intel.com/performance-vpro) for details.

# Intel® Xeon® W-2400 Processors - SKU Table

Processor Number	Processor Cores / Threads	Intel® Smart Cache (L3)	Intel® Turbo Boost Max Technology 3.0 Frequency (GHz)	Intel® Turbo Boost Technology Maximum Single Core Turbo Frequency (GHz)	Processor Base Frequency (GHz)	Unlocked <sup>1</sup>	CPU PCIe Lanes	Memory Support:				Reliability, Availability & Serviceability	Intel Technologies				
								Maximum Memory Speed (MT/s) <sup>2</sup>	Memory Channels	Maximum Memory Capacity <sup>2</sup>	Processor Base Power (W)		Intel vPro <sup>®3</sup>	Intel® ISM <sup>3</sup>	Boxed	RCP (1Ku)	
intel. <b>XEON</b> w7	w7-2495X	24/48	45MB	4.8	4.6	2.5	✓	64	DDR5 4800	4	2TB	225	ECC, Standard RAS	✓	✓	✓	\$2189
	w7-2475X	20/40	37.5MB	4.8	4.6	2.6	✓	64	DDR5 4800	4	2TB	225	ECC, Standard RAS	✓	✓	✓	\$1789
intel. <b>XEON</b> w5	w5-2465X	16/32	33.75MB	4.7	4.5	3.1	✓	64	DDR5 4800	4	2TB	200	ECC, Standard RAS	✓	✓	✓	\$1389
	w5-2455X	12/24	30MB	4.6	4.4	3.2	✓	64	DDR5 4800	4	2TB	200	ECC, Standard RAS	✓	✓	✓	\$1039
	w5-2445	10/20	26.25MB	4.6	4.4	3.1		64	DDR5 4800	4	2TB	175	ECC, Standard RAS	✓	✓		\$839
intel. <b>XEON</b> w3	w3-2435	8/16	22.5MB	4.5	4.3	3.1		64	DDR5 4400 <sup>4</sup>	4	2TB	165	ECC, Standard RAS	✓	✓		\$669
	w3-2425	6/12	15MB	4.4	4.2	3.0		64	DDR5 4400 <sup>4</sup>	4	2TB	130	ECC, Standard RAS	✓	✓		\$529
	w3-2423	6/12	15MB	4.2	4.0	2.1		64	DDR5 4400 <sup>4</sup>	4	2TB	120	ECC, Standard RAS	✓	✓		\$359

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

All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards).

All processors support Intel® Virtualization Technology (Intel® VT-x).

1. Unlocked features for performance tuning. See notices and disclaimers.

2. Maximum memory speeds are associated with 1 DIMM per Channel (1DPC) configurations. Additional DIMM loading on any channel may impact maximum memory speed. Maximum memory capacity is achievable with 2DPC configurations.

3. All versions of the Intel vPro® platform require an eligible Intel® Core™ or Intel® Xeon® W processor, a supported operating system, Intel LAN and/or WLAN silicon, firmware enhancements, and other hardware and software necessary to deliver the manageability use cases, security features, system performance and stability that define the platform. See [intel.com/performance-vpro](https://www.intel.com/performance-vpro) for details.

4. DDR4-4400 MT/s memory speed supported with 1DPC and 2DPC configurations.

# Intel® Xeon® W-3400 and Xeon® W-2400 Unlocked Processors

- Processor Core Tuning
- AVX2, AVX512 and NEW AMX Negative Ratio Offset Tuning
- Mesh Tuning
- Intel® Turbo Boost 2.0 Frequency Tuning
- Intel® Turbo Boost Max Technology 3.0 Tuning

Tuning features available with the Intel® Extreme Tuning Utility (Intel® XTU)

AVAILABLE ON THE FOLLOWING SKUS

Brand Levels	Intel® Xeon® W-3400 Processors	Intel® Xeon® W-2400 Processors
	 Intel® Xeon® w9-3495X (56 Core)	
	 Intel® Xeon® w9-3475X (36 Core)	
	 Intel® Xeon® w7-3465X (28 Core)	 Intel® Xeon® w7-2495X (24 Core)
	 Intel® Xeon® w5-3435X (16 Core)	 Intel® Xeon® w5-2465X (16 Core)

# 50+

## System Designs

From industry-leading Partners

**DELL**  
Technologies

**Z** hp

Lenovo  
**ThinkStation**

**SUPERMICR**

**BOXX**

**Puget Systems**

# Our Partners and Ecosystem

## System Designs

**DELL**  
Technologies

**Z** hp

Lenovo  
**ThinkStation**

**SUPERMICR**

**BOXX**

**Puget Systems**

## Intel® W790 Motherboards

intel  
**CHIPSET**  
W790

intel  
**XEON**  
Supports Xeon®  
W-3400 Processors

intel  
**XEON**  
Supports Xeon®  
W-2400 Processors

**ASRock**

**ASUS**

**GIGABYTE**

**SUPERMICR**

## Thermal Solutions for LGA 4677

**Auras**

**COOLER  
MASTER**

**ekwb**

**noctua**  
DESIGNED IN AUSTRIA

## DDR5 RDIMM Memory

**ADATA**

**Kingston**  
TECHNOLOGY

**Micron**

**SAMSUNG**

**SK hynix**



# Intel Workstation Platforms



## Dual-Socket Expert

4<sup>th</sup> Gen Intel® Xeon® Scalable Processor Family (2x350W)



## Expert

Intel® Xeon® W-3400 Processors (350W)



## Mainstream

Intel® Xeon® W-2400 Processors (225W)

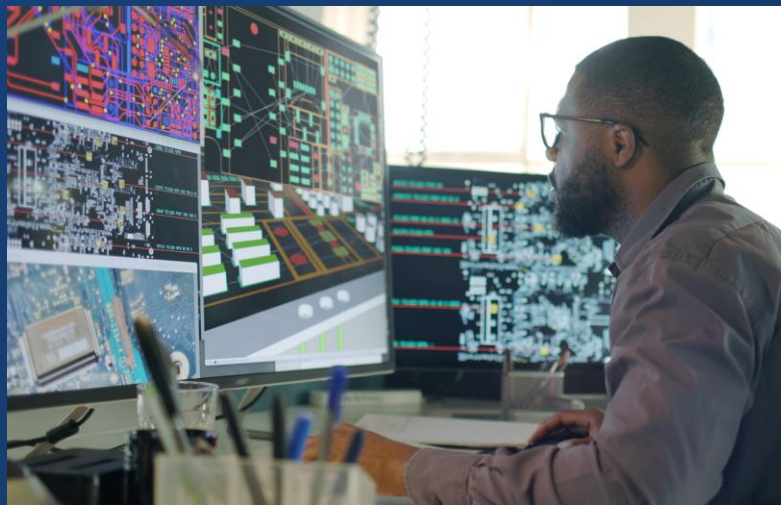


## Mobile and Entry

H, HX-Series  
S-Series (65W/125W)



Intel® Core™ Processors for Workstations



intel<sup>®</sup>  
xeon<sup>®</sup>

Powering the Workstation Renaissance

# Notices and Disclaimers – Pg 1

- Performance varies by use, configuration and other factors. Learn more at [www.Intel.com/PerformanceIndex](http://www.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.
  - Results that are based on systems and components as well as results that have been estimated or simulated using an Intel Reference Platform (an internal example new system), internal Intel analysis or architecture simulation or modeling are provided to you for informational purposes only. Results may vary based on future changes to any systems, components, specifications or configurations.
  - Intel technologies may require enabled hardware, software or service activation. Contact your Intel representative for the latest information
  - 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.
1. Based on performance testing as of January 2023 of Intel® Xeon® w9-3495X processor and other attributes, which combine to form the ultimate workstation experience including in comparison to Intel® Xeon® W-3275 and AMD Threadripper Pro 5995WX (64c). These include:
    - i. Strong processor performance across a collection of benchmarks and real-world workloads across key workstation industry segments: Engineering, Media and Entertainment, and Data Science
    - ii. Platform IO capability advantages, including USB, SATA, PCIe.
    - iii. Unmatched overclocking ability enabled by Intel's comprehensive tools and unique architectural tuning capabilities. Overclocking may void warranty or affect system health. For details see [intel.com/overclocking](http://intel.com/overclocking).
    - iv. Total System Memory capacity with DDR5 RDIMM memory modules.
    - v. Support for best in class wired and wireless connectivity. See [intel.com/performance-wireless](http://intel.com/performance-wireless) and [intel.com/performance-wired](http://intel.com/performance-wired) for details
    - vi. Security by Design: Intel's unparalleled approach to security like security assurance programs founded on security by design principles, transparency and disclosure of vulnerabilities and a robust Intel Platform Update process, an esteemed bug bounty program as well as internal research through red teams and more. Learn more at [intel.com/security](http://intel.com/security)
    - vii. Breadth of available Intel Xeon W price and performance options.
    - viii. Extensive open ecosystem enablement (e.g., OEMs, ODMs, OSs etc.)Additional details available at [intel.com/performanceindex](http://intel.com/performanceindex)
  2. "Up to 28% faster single-threaded performance" Performance measured by Intel on Dec 31<sup>st</sup> 2022. Based on SPEC CPU 2017\_Int\_1copy score results on Intel® Xeon® w9-3495X processor vs. Intel® Xeon® W-3275 processor
  3. "Up to 120% faster multi-threaded performance" Performance measured by Intel on Dec 31<sup>st</sup> 2022. Based on SPEC CPU 2017\_Int\_n copy score results on Intel® Xeon® w9-3495X processor vs. Intel® Xeon® W-3275 processor

# Notices and Disclaimers – Pg 2

4. “Up to 140% more performance in workstation workloads” Performance measured by Intel on Dec 31<sup>st</sup> 2022. Based on SPECworkstation™ 3 v3.1 Media and Entertainment, Product Development, Life Sciences, Financial Services, Energy, and General Operations –Overall score results on Intel® Xeon® w9-3495X processor vs. Intel® Xeon® W-3275 processor
  5. “Up to 130% more performance in content creation workloads” Performance measured by Intel on Dec 31<sup>st</sup> 2022. Performance measured across the following applications: Adobe Premiere Pro, Adobe After Effects, DaVinci Resolve, Maxon Cinema 4D, Chaos Vray and Autodesk Maya
  6. “Up to 70% higher performance in engineering workloads” Performance measured by Intel on Dec 31<sup>st</sup> 2022. Performance measured across the following applications: Autodesk Revit, Autodesk AutoCAD, Autodesk Inventor, Dassault Stellar, SPECapc for Solidworks, Autodesk ReCAP, Autodesk 3DS MAX and Bentley Microstation
  7. “Up to 75% higher performance in scientific computing and analysis” Performance measured by Intel on Dec 31<sup>st</sup> 2022. Performance measured in NumPy/SciPy - Python 3.9.12 - iBench benchmark. Performance is based on the time to complete the Algorithm: Inv, N=25000.
- Your costs and results may vary.
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# Hardware Configurations

## Intel® Xeon® W-3400 Processors

- Intel® Xeon® w9-3495X processor, PL1= 350W TDP, 56C/112T, Turbo up to 4.6 GHz, Motherboard Name: Intel FHF RVP, Motherboard type: Pre-production, BIOS: BKC ver FHFDCRB.86B.WR.64.2022.42.2.03.0433\_0045.D31\_Pa0310\_SPR\_E3E5\_S2S3\_ADL\_B1\_PV\_ME16, Graphics: Nvidia Quadro RTX4000, Gfx version: 517.40, Memory: 256GB (8x32GB) DDR5-4800MHz ECC RDIMMs, Storage: 1TB Samsung 980 Pro, OS: Microsoft Windows\* 11 Enterprise (22H2) Service Pack 22621.1, Build Version: BKC Image (22621.1250.rx64.ent\_FRE\_IA-64\_FHF-GOLD-22.47.1.15-Nickel), CPU Cooler: Air cooled

## Previous Gen Platform:

- Intel® Xeon® W-3275 processor, PL1= 205W TDP, 28C/56T, Turbo up to 4.6 GHz, Motherboard Name: ASUS C621-64L Sage 10G, Motherboard type: Production, BIOS: 6802, Graphics: Nvidia Quadro RTX4000, Gfx version: 517.40, Memory: 192GB (6x32GB) DDR4-2933MHz ECC RDIMMs, Storage: 1TB Samsung 980 Pro, OS: Microsoft Windows\* 11 Enterprise (22H2) Service Pack 22621.1, CPU Cooler: Air cooled
- 2S intel® Xeon® Gold 6258R, PL1= 205W TDP, 2x28C/56T, Turbo up to 4.0 GHz, System Name: HP Z8 G4, BIOS: 02.82 Rev.A, Graphics: Nvidia Quadro RTX4000, Gfx version: 517.40, Memory: 12GB (12x32GB) DDR4-3200MHz ECC RDIMMs, Storage: 1TB Samsung 980 Pro, OS: Microsoft Windows\* 11 Enterprise (22H2) Service Pack 22621.1, CPU Cooler: Air cooled

# Workload Details – Pg.1

- **Adobe Premiere Pro 23.0 – Standard Overall Score - PugetBench for Adobe Premiere Pro** Results are a score (Higher is better) in reference to a standardized system configuration determine by Puget Systems. PugetBench for Adobe Premiere Pro is published by Puget Systems, a workstation system builder. Puget Systems designs their benchmarks based on their customer workloads. The Puget Bench for Adobe Premiere Pro tests a Multi-Cam and Lumetri Color sequences with multiple 4K, 8K and 4K 10-bit video media codes and tests both live timeline/sequence playback (achieving 29.97 FPS) and exporting performance. For more information about PugetBench visit: <https://www.pugetsystems.com/labs/articles/PugetBench-for-Premiere-Pro-1519/>
- **Adobe After Effects 22.4 - Standard Overall Score - PugetBench for After Effects** Results are a score (Higher is better) in reference to a standardized system configuration determine by Puget Systems. PugetBench for Adobe After Effects is published by Puget Systems, a workstation system builder. Puget Systems designs their benchmarks based on their customer workloads. The Puget Bench for After Effects tests a variety of workloads to determine application performance across Multi-Core, RAM Preview, GPU, Render and Tracking/Animation workloads. For more information about PugetBench visit: <https://www.pugetsystems.com/labs/articles/PugetBench-for-After-Effects-1287/>
- **Autodesk AutoCAD 2023:** The Cadalyst Systems Benchmark 2015 (C2015 v5.5b) can be used to test and compare the performance of systems running AutoCAD v2022 and earlier. Performance is measure via a score (higher is better) Test files are available free for download. <https://www.cadalyst.com/benchmark-test>
- **Autodesk Revit 2022 – Modeling and Rendering – RFO benchmark:** Autodesk Revit\* RFO BenchmarkV3.3 - Full\_Expanded is a benchmark that opens an example Autodesk Revit project and measures performance times (in seconds, lower is better) split between two sections: Model Creation and Drawing of Models on screen. In the Model Creation phase the following tasks are tested inside of Autodesk Revit: Opening and loading the custom template, Creating the floors levels and grids, Creating a group of walls and doors, Modifying the group by adding a curtain wall, Creating the exterior curtain wall, Creating the sections, Changing the curtain wall panel type, Creating area plans, Creating and applying view template. In the Graphics phase the following tasks are tested inside of Autodesk Revit: For more information visit: <https://revitforum.org/showthread.php/35955-RFO-Benchmark-v3>
- **Autodesk Inventor 2022.3 - AutoDesk Inventor Benchmark Tool v1.8.0** is a benchmarking application that can be used to test the performance of Autodesk® Inventor® on a given system. The tool runs a product modeling workflow on a given system and gives it an Inventor PC Index (IPI) score(higher is better) based on a Modeling test, Graphics Intensive tests and Storage intensive tests. For more information: [https://apps.autodesk.com/INVNTOR/en/Detail/Index?id=3667345248776204460&appLang=en&os=Win32\\_64](https://apps.autodesk.com/INVNTOR/en/Detail/Index?id=3667345248776204460&appLang=en&os=Win32_64)

# Workload Details – Pg.2

- **Autodesk Maya 2023 – SpecAPC for Maya 2023.1.0 (CPU Composite Score)** is all-new performance evaluation software for systems running Autodesk Maya 2023 3D animation and visual effects software. The SPECapc for Maya 2023 benchmark consists of 47 tests using eleven different models and animations. Performance is measured in a score (Higher is better). For more information: <https://gwpg.spec.org/benchmarks/benchmark/specapc-maya-2023/>
- **Autodesk 3DS MAX 2023 - Fluid Simulation** - This workload measures the time taken by Autodesk 3ds Max to create a fluid simulation of 60 frames with a Base Voxel Size of 1.0. The user is producing a quick, less-detailed preview of their work-in-progress for an internal review.
- **Autodesk ReCAP 2023 - Ingest Point Cloud** - This workload measures the time (less is faster) taken by Autodesk ReCap Pro to import a 2.38GB .e57 point cloud file into a new project. The source file is publicly available from GeoSlam - <https://samples.geoslam.com/Potree/baton/baton.html>
- **Bentley Microstation 10.17 - Render Lobby Scene** This workload measures the time taken by Bentley MicroStation to Render a Scene using Path Tracing with settings for 'Interior Extreme' with 4096 'Max. Samples per pixel'. Performance is measured in time in seconds (lower is better) to render the scene.
- **Cinebench R23** is a cross-platform test suite that evaluates a system's hardware capabilities to render a 3D image inside a rendering application like Cinema 4D, Made by Maxon. For more information visit: <https://www.maxon.net/en/cinebench/>
- **Chaos vRay 5.01 - V-Ray benchmark** measures how fast (score, higher is better) a given hardware component renders a 3D scene giving a score measure in max/peak vsamples. Compatibility with CPU based rendering, GPU CUDA rendering and GPU RTX rendering. <https://www.chaos.com/vray/benchmark>
- **Dassult Solidworks 2022 - SPECapc® for Solidworks® 2022 benchmark**, released on August 18, 2022, is performance evaluation software for vendors and users of computing systems running Solidworks 2022 CAD/CAM software on Microsoft Windows 10 64-bit platforms. The SPECapc for Solidworks 2022 benchmark includes 10 models and 50 tests exercising a full range of graphics and CPU functionality. CPU Performance is measured in a CPU Composite Score (Higher is better). For more information: <https://gwpg.spec.org/benchmarks/benchmark/specapc-solidworks-2022/>

# Workload Details – Pg.2

- **DaVinci Resolve 18.1 – PugetBench 93.1** Results are a score (Higher is better) in reference to a standardized system configuration determine by Puget Systems. PugetBench for Davinci Resolve is published by Puget Systems, a workstation system builder. Puget Systems designs their benchmarks based on their customer workloads. The Puget Bench for Davinci Resolve tests rendering with a wide range of codecs at 4K and 8K (Extended preset only) resolutions, OpenFX, as well as performance in Fusion. For more information about PugetBench visit: <https://www.pugetsystems.com/labs/articles/PugetBench-for-DaVinci-Resolve-1523/>
- **Maxon Cinema4D 2023.1** - Cinema4D is a 3D software suite to generate 3D models, textures, computer graphics, and animations developed by the German company Maxon. Workload consists of rendering the standard image for Cinebench R23, measured in Time in Seconds (Lower is better). For more information: <https://www.maxon.net/en/downloads/cinebench-r23-downloads>
- **NumPy/SciPy (Python 3.9.13)** – ibench For the NumPy and SciPy-based benchmarks, we used Intel ibench to replicate and time the popular functions independently. The tests stress commands in linear algebra that are used throughout NumPy/SciPy for preprocessing, such as dot, det, inv, lu, qr, and svd. Performance is measured in time in seconds (lower is better) to complete stress tests of each individual linear algebra algorithm. For more information: <https://github.com/IntelPython/ibench>
- **SPEC CPU 2017** - SPECrate2017 is the industry-standardized, CPU intensive suites for measuring and comparing compute intensive performance, stressing a system's processor, memory subsystem and compiler. Performance is measured for floating point (FP) and Integer (Int) across single-thread (1-copy) and multi-thread (n-copy), given in a score (higher is better). Compiler used for testing: ic2022.1, For more Information: <https://www.spec.org/cpu2017/>
- **SPECworkstation™ 3.1** is published by the Standard Performance Evaluation Corporation (SPEC), a benchmarking consortium. SPECworkstation 3 measures Workstation Application Performance using workloads addressing the following workstation markets: Media and Entertainment - 3D Modeling, Video Transcoding, Ray Tracing and CAD using Blender, HandBrake, LuxRender, Autodesk Maya and 3ds Max; Product Development - heterogeneous computing and CAD/CFD using Rodinia Suite, OpenFOAM, CalculiX, Dassault Systèmes Catia, PTC Creo, Siemens NX, Dassault Systèmes SolidWorks and Autodesk Showcase; Life Sciences – Molecular Dynamics Simulation using LAMMPS, NAMD, Rodinia Suite and Medical Imaging; Financial Services - Financial Modeling using Black-Scholes and Monte Carlo simulations; Energy (Oil & Gas) - Seismic Data Processing and Imaging; General Operations - including 7-Zip, Python scripting and Octave programming; GPU Compute - OpenCL and GPU Compute - CUDA. A CPU, Graphics and Storage scores are also produced. The Rodinia Suite includes workloads for: Data Mining, Bioinformatics, Physics Simulation, Pattern Recognition, Image Processing, Medical Imaging, Graph Algorithms and Web Mining. For Windows\*, SPEC Workstation 3 supports Win64. For more information visit: <https://www.spec.org/gwpg/wpc.static/workstation31info.html>



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