



PURPOSE-BUILT FOR PROFESSIONAL COMPUTING APPLICATIONS IN DESIGN AND MANUFACTURING



With its introduction of the AMD Ryzen™ Threadripper™ PRO processors in 2020, AMD ushered in the third wave of high performance workstation computing, marrying the best of superscalar and multi-core CPU design with the AMD Infinity architecture. Now in its second generation, the Threadripper PRO processors provide unique access to dramatic performance scaling for the rapidly expanding range of modern professional workloads.

The first generation AMD Ryzen™ Threadripper™ PRO processors not only achieved breakthrough performance scaling with single-chip options of up to 64 cores, levels previously attainable only through the costly addition of a second socket, it did so with industry-leading clock frequencies<sup>5</sup> to sustain the best possible overall throughput. Building on that initial synergy, and deploying AMD “Zen 3” microarchitecture, second generation of Ryzen™ Threadripper™ PRO 5000 WX-Series processors drive aggregate performance even further, offering a workstation processor best equipped to accelerate the evolving and varied computation in modern design and manufacturing workflows.

### AMD RYZEN™ THREADRIPPER™ PRO 5000 WX-SERIES PROCESSORS: RIDING THE THIRD WAVE OF WORKSTATION COMPUTING

AMD Ryzen™ Threadripper™ PRO processors manage to create this inflection point on the back of three key technologies, marking a new era – a third wave – in workstation CPUs: the “Zen” microarchitecture gains in superscalar throughput, a consistent progression in manufacturing to enable higher-density on-chip cores, and AMD Infinity architecture, a novel chiplet approach that allows ease of performance scaling while mitigating challenges in thermal dissipation and product costs. The combination enables both the highest core count available, as well as higher base frequencies at the same core count, as compared to the comparable competitive processor family<sup>1</sup>. For example, a 12 core Threadripper™ PRO 5945WX processor can sustain an operating base frequency of up to 4.1 GHz, while the top-end Threadripper PRO 5995WX processor scales up to a massive 64 cores, 26 more cores than the competing single-processor workstation CPU today<sup>1</sup>.

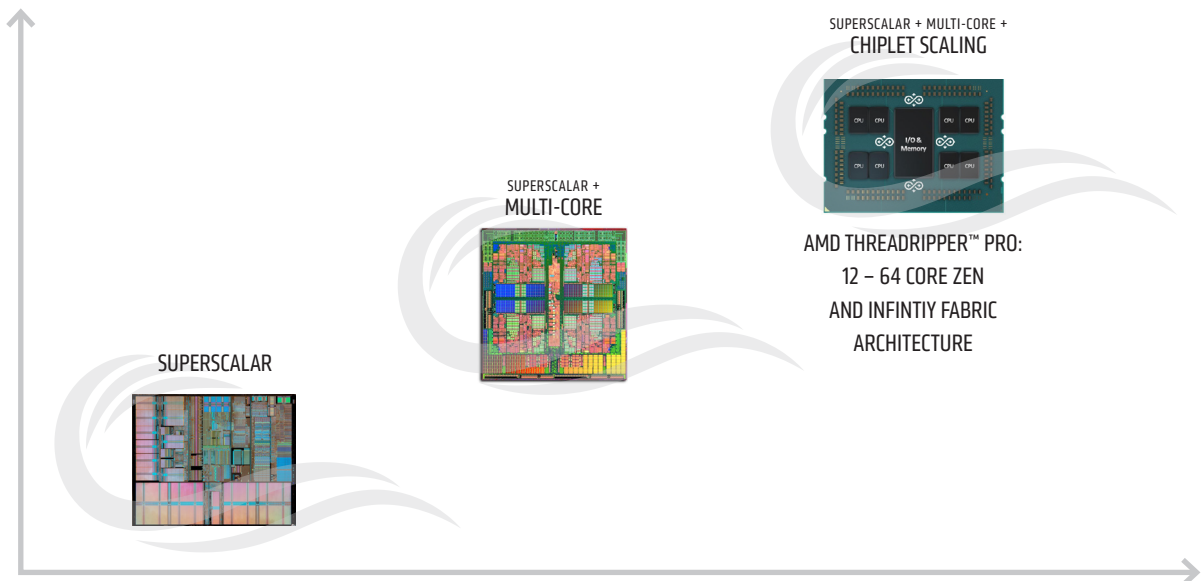


FIGURE 1: THREADRIPPER™ PRO PROCESSORS ARE PIONEERING A THIRD WAVE IN HIGH-PERFORMANCE WORKSTATION COMPUTING

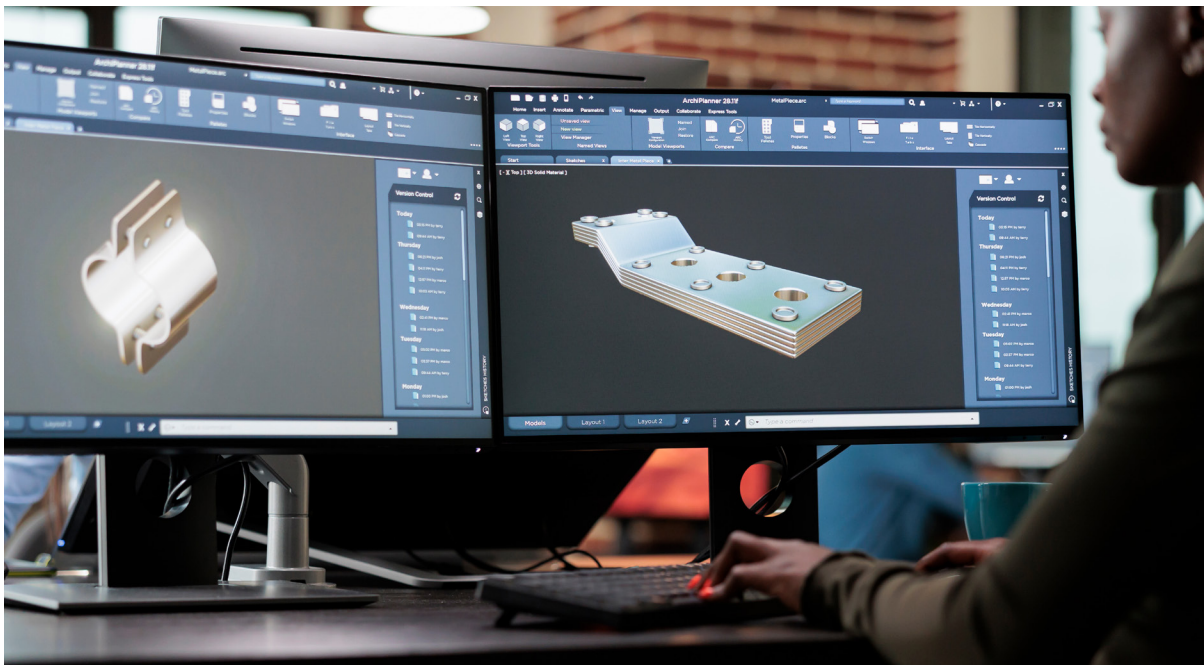
PROCESSOR	CORES / THREADS	BASE / TURBO FREQUENCY <sup>2</sup> (GHZ)	L2+L3 CACHE (MB)	GEN 4 PCI-E <sup>®</sup> LANES	MEMORY CHANNELS
Ryzen™ Threadripper™ PRO 5995WX	64 / 128	2.7 / up to 4.5	288	128	8
Ryzen™ Threadripper™ PRO 5975WX	32 / 64	3.6 / up to 4.5	144	128	8
Ryzen™ Threadripper™ PRO 5965WX	24 / 48	3.8 / up to 4.5	140	128	8
Ryzen™ Threadripper™ PRO 5955WX	16 / 32	4.0 / up to 4.5	72	128	8
Ryzen™ Threadripper™ PRO 5945WX	12 / 24	4.1 / up to 4.5	70	128	8

**FIGURE 2: THE AMD RYZEN™ THREADRIPPER™ PRO 5900 WX-SERIES WORKSTATION PROCESSORS (SOURCE: AMD)**

Regardless of performance, no workstation platform will get far without as much attention given to reliability and availability as to throughput. Threadripper™ PRO processors check those boxes and more, enabling hardware security with AMD PRO technologies – including the AMD Security Processor (ASP), Memory Guard<sup>3</sup> and Secure Boot –with support for Microsoft Endpoint Manager and Windows Defender Application Guard malware prevention.

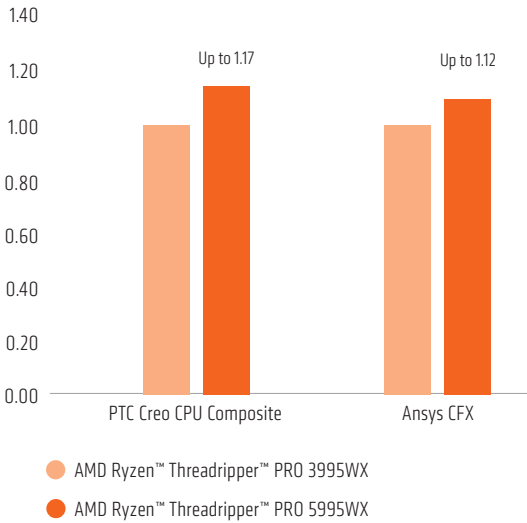
## **DRIVING THE DESIGN AND MANUFACTURING WORKFLOW FORWARD WITH A UNIQUE COMBINATION OF BOTH SINGLE AND MULTI-THREAD PERFORMANCE**

The pressure to deliver more optimal design and efficient, precise production and assembly has pushed CAD/CAE/CAM software to extract every drop of throughput available from multi-core CPUs. Think simulations from CFD to FEA, and accurate physically-based rendering for ensuring aesthetics that matters in even the most utilitarian of projects. All lend themselves well to parallel execution across a multitude of processor cores. But for design and manufacturing professionals, an indispensable portion of their code base remains largely at the mercy of the speed of a single thread of execution. Look no further than the parametric modeling and interactive 3D graphics that form the foundation of so many workflows.

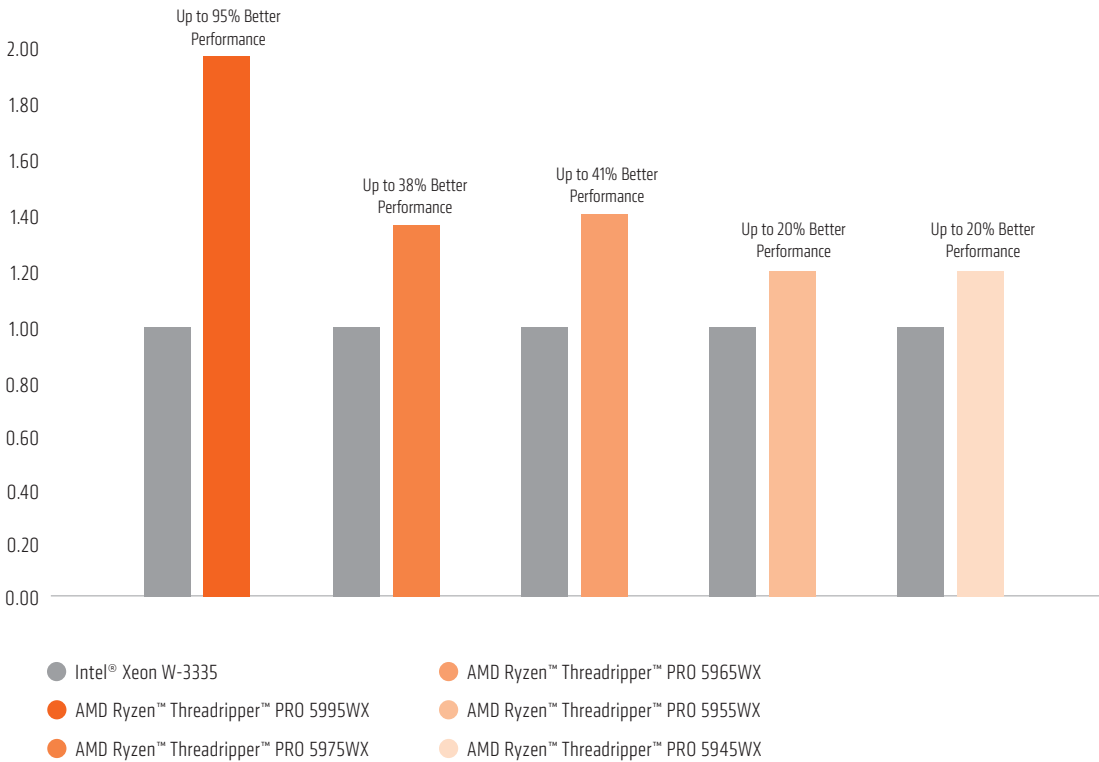


**THREADRIPPER™ PRO PROCESSORS PRESENT A BEST-OF-BOTH-WORLDS CAD COMPUTE OPTION: JUGGLING MODELING, SIMULATION, RENDERING AND MORE MEANS A BROAD MIX OF SINGLE AND MULTI-THREADED WORKLOADS IN MODERN DESIGN AND MANUFACTURING WORKLOADS**

AMD Ryzen Threadripper™ PRO processors offers a novel combination of breakthrough multi-thread performance scaling with dramatic generation-to-generation gains in single-thread execution, which yields the ideal compute engine to drive the balanced demands of today's modern design and manufacturing workloads. For example, looking at the SPECworkstation PTC Creo CPU Composite estimate scores, the 5995WX is up to 17% faster than the previous 64 core Threadripper PRO 3995WX. For multithreaded workloads like simulation, the 5995WX is up to 12% faster than its predecessor in Ansys CFX<sup>3</sup>.



Furthermore, multithreaded performance continues to outshine the competition in rendering/visualization tasks. For example, the 16 core 5955WX delivers up to 20% better rendering performance than the competing Intel Xeon W-3335<sup>4</sup>.



## A BEST OF BOTH WORLDS: COMPUTING PROPOSITION FOR DESIGN AND MANUFACTURING

There is no such thing as a perfect one-size-fits-all hardware solution to any professional's computing needs. Particularly in CAD/CAM/CAE applications, the workloads have simply become too varied – notably with respect to algorithms amenable to parallel execution versus those that remain serially constrained. But a processor that comes closest would be one that manages to consistently improve single threaded performance from generation to generation while offering the ability to scale across the broadest range of core counts. It would represent a sweet spot CPU that enables state-of-the-art concurrent thread execution for modern and highly-parallel workloads while helping ensure consistent performance for legacy or serial. Simply put, that processor is now embodied in the AMD Ryzen Threadripper PRO 5000 WX-Series processor which are now available in premium workstation models from leading workstation vendors, including [Lenovo](#) and [Dell](#). For a deeper dive into Threadripper PRO processor's novel architectural approach to workstation computing, refer to the main whitepaper ([link here](#)).

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1. Max boost for AMD Ryzen™ Threadripper™ processors is the maximum frequency achievable by a single core on the processor running a bursty single-threaded workload. Max boost will vary based on several factors, including, but not limited to: thermal paste; system cooling; motherboard design and BIOS; the latest AMD chipset driver; and the latest OS updates. GD-150
  2. Full system memory encryption with AMD Memory Guard is included in AMD Ryzen PRO, AMD Ryzen Threadripper PRO, and AMD Athlon PRO processors. Requires OEM enablement. Check with the system manufacturer prior to purchase. GD-206
  3. Based on AMD Labs testing as of January 31, 2022 using the Chaos V-Ray benchmark, the Adobe After Effects (Puget Systems) benchmark, the Chromium compile benchmark, the SPECcapc® for PTC Creo 3.0 Graphics Composite metric, SPECcapc® for Solidworks 2021 CPU Composite metric, the Ansys CFX benchmark, the Revit RFO model creation benchmark, DaVinci Resolve (Puget systems) Luxion Keyshot benchmark and the Cadalyst AutoCAD benchmark to compare the Ryzen Threadripper PRO 5995WX reference system configured with 8x32GB DDR4 3200, NVIDIA Quadro RTX A5000, 1TB SSD, Win 11 vs. a similarly configured Threadripper PRO 3995WX reference system. Results may vary. SPEC®, and SPECcapc® are registered trademarks of the Standard Performance Evaluation Corporation. See [www.spec.org](http://www.spec.org) for more information. GGP-3
  4. Based on AMD performance lab testing on January 31, 2022, using the Revit RFO benchmark, the V-Ray benchmark and the Unreal Engine compile benchmark and the After Effects (Puget systems) benchmark to compare performance of (5) AMD Ryzen™ Threadripper™ PRO 5000WX-Series reference systems, each configured with 8x32GB DDR4, NVIDIA Quadro RTX A5000, 1TB SSD, Win 11 vs. (5) similarly configured BOXX APEXX4 workstations with Intel® Xeon® W-3300 series processors. Results may vary. CGP-21
  5. Based on AMD internal analysis, September 2022. The Intel Xeon W-3300 Series, offers up to 38 cores, while the Threadripper™ PRO 5000 WX Series offers up to 64 cores. Comparing the individual SKUs of the same core count in the respective processor series, the Threadripper™ PRO 5000 WX Series processors' base frequencies are higher. CGP-32

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