AMD THREADRIPPER PRO

PURPOSE-BUILT FOR PROFESSIONAL COMPUTING APPLICATIONS IN ARCHITECTURE, ENGINEERING AND CONSTRUCTION

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 and 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 base clock frequencies[1] to sustain outstanding overall throughput. Building on that initial synergy, and deploying AMD "Zen 3" microarchitecture, Ryzen™ Threadripper™ PRO 5000 WX-Series processors drive aggregate performance even further, offering a workstation processor equipped to accelerate the evolving and varied computation in modern AEC and BIM 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 3" 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. 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[1]. 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, up to 26 more cores than the competing single-processor workstation CPU today[1].

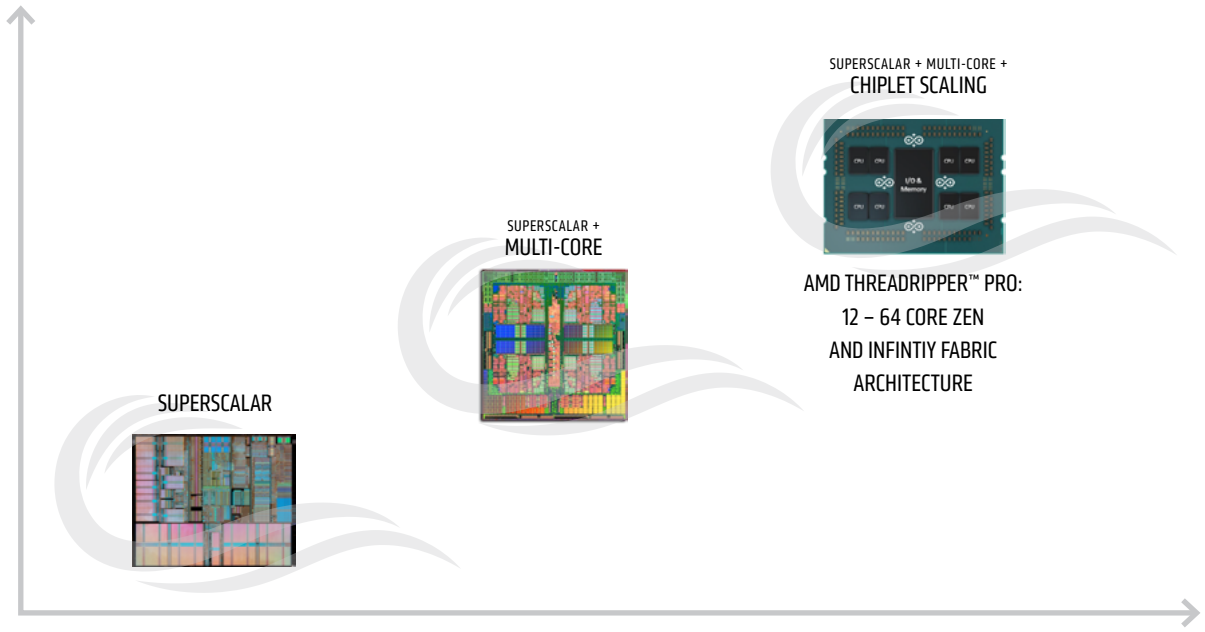

FIGURE 1: THREADRIPPER™ PRO PROCESSORS ARE PIONEERING A THIRD WAVE IN HIGH-PERFORMANCE WORKSTATION COMPUTING

PROCESSOR	CORES / THREADS	BASE / TURBO FREQUENCY[2] (GHZ)	L2+L3 CACHE (MB)	GEN 4 PCIE® 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 5000 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[3] and Secure Boot –with support for Microsoft Endpoint Manager and Windows Defender Application Guard malware prevention.

SCALABLE, BALANCED PERFORMANCE CRUCIAL TO RUN MODERN AEC WORKFLOWS

There was a time when an architect, engineer or builder out shopping for a new workstation might be advised simply to "pick the processor with the highest GHz" – but that rule of thumb is long gone. Yes, the GHz still matters, and AMD Ryzen Threadripper PRO industry-leading clock rates[1] are a clear testament to its importance.

But in an age where much of the horsepower of modern CPUs stems from its ability to concurrently execute multiple threads, ISVs today strive to squeeze every drop of parallelism from their core operations. On top of that, workloads that have always naturally taken advantage of multiple compute cores are moving from nicety to necessity – think jobs like photorealistic renderings and physically based light simulations. With a series that scales from 12 to an industry-leading 64 cores[1], AMD Ryzen™ Threadripper™ PRO 5000 WX-Series processors delivers MT performance in spades. For example, the flagship 64-core 5995WX can render V-Ray scenes up to 25% faster than the previous generation 3995WX processor.[4]

PHOTO-REALISTIC RENDERING AND ILLUMINATION NO LONGER OPTIONAL COMPUTING IN AEC

Despite the clear path forward in multi-core architectures – with scaling enhanced by the AMD Infinity architecture – superior 1T performance remains a top priority for any true workstation-caliber CPU. Consider AEC staples like AutoCAD and Revit, which still lean heavily on single-thread (1T) execution for the creation and viewing of parametric models, pervasive on both the design and construction sides of projects. That's where both the instructions per cycle – IPC, a measure of how many instructions from a single thread of execution – and clock frequencies come into play. AMD engineers turned both dials up dramatically with the AMD Ryzen Threadripper™ PRO 5000-WX Series processors, as evidenced by running the Revit model creation benchmark where we see the 5995WX yielding 15% better performance than the previous generation.[4]

A BEST OF BOTH WORLDS PROPOSITION FOR AEC COMPUTING

There is no such thing as a perfect one-size-fits-all hardware solution to any professional's computing needs. Particularly in AEC applications, the workloads have simply become too varied – notably with respect to algorithms amenable to parallel execution versus those that remain serially constrained. Threadripper PRO offers full spectrum performance, a sweet spot CPU that enables outstanding concurrent thread execution for modern and highly-parallel workloads while ensuring consistently higher performance for legacy or serial tasks. Simply put, AMD Ryzen Threadripper PRO 5000 WX-Series processors are ideal for AEC workloads.

AMD Ryzen™ Threadripper™ PRO 5000WX Series processors 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).

1. Based on AMD internal analysis, September 2022, comparing the Intel Xeon W-3300 Series, which offers up to 38 cores, while the Threadripper™ PRO 5000 WX Series processor stack 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 than Intel. CGP-32
2. 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
3. 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.
4. 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 SPECapc® for PTC Creo 3.0 Graphics Composite metric, SPECapc® for Solidworks 2021 CPU Composite metric, the Ansys CFX benchark, 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 SPECapc® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information. GGP-38

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