5 REASONS 4TH GENERATION AMD EPYC™ PROCESSORS ARE ADVANCING DATA CENTER PERFORMANCE AND ENERGY EFFICIENCY

AT A GLANCE

In today's world time is everything. Time to Market. Time to Value. Time to Results. AMD EPYC 9004 Series processors offer the next generation of server performance and efficiency to deliver on those goals, helping enable better data agility, treating data as a living, breathing asset and unlocking new opportunities with deeper insight. With AMD EPYC processors, it's possible to use fewer servers to get the job done, enabling rapid digital transformations, continued productivity improvements and new levels of energy efficiency.
Built on the AMD "Zen 4" architecture and supported by a broad ecosystem of ready solutions and technology partnerships, the AMD EPYC 9004 Series processors features the world's highest-performing x86 server processor SP5-013A and is optimized for a wide range of workloads from the enterprise to the cloud.

1 EXPERIENCE CONTINUED PERFORMANCE LEAPS

AMD EPYC 9004 Series processors again deliver on the multi-generation AMD EPYC processor roadmap, featuring innovative design that continues to enable powerful performance for demanding computing workloads. Among the industry firsts included with the AMD EPYC 9004 Series: the only x86-compatible 5nm CPUs, with up to 96 x86 "Zen4" cores; it offers 12 DDR5 memory channels – more memory channels than any other x86 processor EPYC-033 – for the highest X86 memory throughput; EPYC-032 and 128 PCIe® Gen5 lanes that maximize I/O. EPYC-035 The results: gain 2.1x the integer and 2.2x the floating-point top-of-stack performance compared to our previous generation processors. SP5-001C, SP5-002C

2 OPEN UP A NEW WORLD

AMD EPYC processor-based servers are everywhere, from public and private clouds to virtual machines and containers and out to the edge. They help generate new value from remarkable workload performance with an x86-compatible system-on-chip that's designed for solutions, not just specs. AMD EPYC processor-powered data centers can be found across all industry verticals from manufacturing and retail to healthcare, financial services and more, enabling exceptional performance for industry specific workloads, advanced virtualization, hyperconverged infrastructure, containerization and exceptional database performance. Take the opportunity to redefine your potential and set new, ambitious goals.

3 MODERNIZE EFFICIENTLY WHILE ADDRESSING DATA CENTER SUSTAINABILITY GOALS

High performance, energy-efficient servers built on AMD EPYC 9004 Series processors can help you scale your data center in remarkable new ways while also optimizing it to support your efficiency and TCO goals. AMD helps you address your data center sustainability goals, even as we push the limits of high-performance computing

4 TARGET AND MANAGE A NEW SET OF BUSINESS VULNERABILITIES

How can you best manage the myriad of new risks facing your business, everything from hackers and compliance vulnerabilities to business continuity? The AMD 'Security by Design" approach includes a set of state-of-the-art security features and a silicon embedded security subsystem to help protect your most valuable asset: your data. The AMD EPYC 9004 Series expands on the AMD Infinity Guard[1] security feature set to further encrypt data in cloud and virtualized environments, helping address the special security concerns about migrating sensitive applications and data. In addition, help protect your business by investing with the confidence that AMD works with suppliers to advance human rights and maintain supply chain resilience.

5 ENABLE NEW CAPABILITIES FOR YOUR BUSINESS

Large or small, every organization can benefit from the innovations and performance breakthroughs AMD EPYC processors deliver for the world's most demanding workloads. Configure your platform to address your most demanding applications without burdensome tradeoffs. Apply the advantages of AMD EPYC 9004 Series processors to raise the bar for breakthrough performance on your most demanding workloads, no matter your data center design or industry challenges.

Continue reading for more technical detail

TECHNICAL DEEP DIVE

#1 EXPERIENCE CONTINUED PERFORMANCE LEAPS

- AMD EPYC 9004 Series processors **deliver 110% better generational integer performance** at the top of stack and 26% better estimated average generational integer performance across 16, 24 and 32-core CPUs. SP5-001C, SP5-019
- Get phenomenal competitive performance. Nine two-socket and four one-socket AMD EPYC 9004 Series processor-based servers are estimated to outperform a top-of-stack two-socket Intel® Xeon® Platinum 8380 CPU on SPECrate®2017_int_base. SP5-020
- Get the **highest x86 memory throughput** available today, 2.25x the max memory throughput of Intel® Scalable "Ice Lake" CPUs. EPYC-032
- AMD EPYC 9004 Series processors support **up to 50% more memory channels** than any other x86 server CPU. EPYC-033
- 2x PCIe® lanes at 2x the throughput with PCIe®5 means AMD EPYC 9004 Series processors have **4x the total I/O capability** of Intel Scalable "Ice Lake" CPUs to support the high bandwidth demands of a wide array of vertical industry applications. EPYC-036
- Improve Business Ops per Second: A 2P 96-core AMD EPYC 9654 powered server delivers **90% better generational top-of-stack server-side Java® performance** SP5-005C and 185% more performance than a comparable server with the top competitive x86 CPU. SP5-012B
- Floating point performance powers HPC: A 2P 96-core AMD EPYC 9654 powered server delivers **120% better gen-over-gen top-of-stack floating-point performance** SP5-002C and 2.5x the performance than a comparable server with the top competitive x86 CPU. SP5-009C
- With a broad and growing ecosystem of platforms, instances and solutions, you can build and scale your hybrid, multi-cloud or native platforms to advance your data center goals.

#2 OPEN UP A NEW WORLD

- With a wide range of x86 compatible CPU models, AMD EPYC Series processors can propel flexible digital transformations, enable performance gains and help you adopt breakthrough applications while simultaneously delivering data center efficiency – no matter your industry or business need.
- AMD EPYC processors have earned **300+ world records** for performance across a wide range of workloads. For a complete list of world records see amd.com/worldrecords.
- A 2P 16-core AMD EPYC 9174F powered server offers **~30% higher Oracle 19c DSS performance** for more queries per hour than a previous generation 2P 16-core AMD EPYC 73F3 powered server. SP5-030
- In a top-of-stack comparison, 2P 96-core AMD EPYC 9654 powered servers deliver up to **~2.5× faster weather forecasting performance** on WRF CONUS 2.5km than 2P 40-core Intel® Xeon® Platinum 8380 powered servers. SP5-032
- 2P 32-core AMD EPYC 9374 powered servers enable up to **75% higher top-of-stack average Ansys® Fluent® performance** than 2P 32-core Intel® Xeon® Platinum 8362 powered servers for improved computational fluid dynamics. SP5-035A
- 2P 96-core AMD EPYC 9654 powered servers deliver up to **160% higher Altair® Radioss™ Neon performance** than 2P 40-core Intel® Xeon® Platinum 8380 powered servers for improved finite element analysis. SP5-036
- A 2P 64-core AMD EPYC 9554 powered server offers up to **~2.1x the performance on the Black-Scholes European options pricing workload** than a 2P 40-core 3rd Gen Intel® Xeon® Platinum 8380 powered server. SP5-031
- A 2P 64-core AMD EPYC 9554 powered server offers **3.3x the rendering score performance on the Chaos® V-Ray rendering** benchmark of a 2P 40-core Intel® Xeon® Platinum 8380 powered server. SP5-038A
- A 2P 64-core AMD EPYC 9654 powered server offers up to **~2.4x the ray-tracing score performance** of a 2P 40-core Intel® Xeon® Platinum 8380 powered server on the Autodesk® Arnold gtc_robot workload. SP5-039

#3 MODERNIZE EFFICIENTLY WHILE ADDRESSING DATA CENTER SUSTAINABILITY GOALS

- 2-node, 2P 96-core AMD EPYC 9654 powered servers provide **1.8x better virtualization performance and 3.1x the VM capacity** than 2-node, 2P 40-core Intel® Xeon® Platinum 8380 powered servers running VMware® VMmark® 3.1.1 matched pair for improved server consolidation and mixed workload management. SP5-049B
- Moving just a few servers to AMD EPYC CPUs can make a big impact. It takes just 8 new 2P 96-core AMD EPYC 9654 powered servers to deliver 1500 VMs with 1 core and 8GB of memory per VM compared to 47 four-year-old 16-core Intel® Xeon® 6130 powered servers. The AMD EPYC-based solution uses an estimated **89% fewer servers, and 57% less power**, saving ~516,633kWH of electricity over three years, resulting in the carbon sequestration equivalent of 94 acres of US forest annually. SP5TCO-016
- Get **~24% more integer performance** SP5-003A **and ~52% more floating-point performance** SP5-004A **per watt** than the previous processor generation at the same core count (2x 64-core AMD EPYC 9534 vs 2x 64-core AMD EPYC 7763).

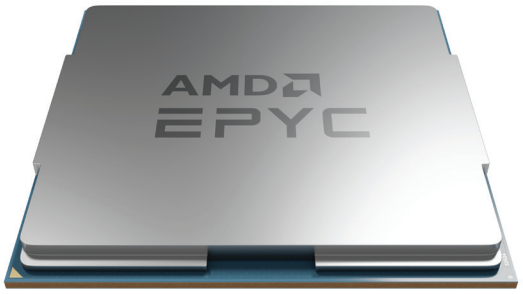
#4 TARGET AND MANAGE A NEW SET OF BUSINESS VULNERABILITIES

- Building on the state-of-the-art AMD Infinity Guard security feature set, 4th Gen AMD EPYC processors add improved features such as 256b AES-XTS encryption and SEV-SNP for CXL™ type 3 memory expansion to help make strong security features even stronger.
- Leverage a growing ecosystem for confidential computing, encrypting data in-use in cloud and virtualized environments.
- AMD works with our suppliers to advance human rights, environmental sustainability and supply chain resilience.

#5 ENABLE NEW CAPABILITIES FOR YOUR BUSINESS

- Get the exascale-class technology you need to explore the latest applications across vertical industries from financial services and life sciences to media/entertainment and oil/gas.
- Start from where you are today, make fast improvements and then further optimize and scale your systems to expand your business's capabilities.

4TH GEN AMD EPYC PROCESSORS ARE RAISING THE BAR...AGAIN.



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For details on the claims used in this document, visit amd.com/en/claims/epyc.

1 AMD Infinity Guard features vary by EPYC Processor generations. Infinity Guard security features on AMD EPYC processors must be enabled by server OEMs and/or cloud service providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard. GD-183.