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3rd Gen AMD EPYC Processors with AMD 3D V-Cache Technology Deliver Outstanding Leadership Performance in Technical Computing Workloads

— Newest addition to 3rd Gen AMD EPYC™ family features 768MB of L3 cache, drop-in platform compatibility, and modern security features —

— The EPYC processor ecosystem for technical computing grows with solutions from major OEMs, ODMs, SIs, ISVs and the cloud —

SANTA CLARA, Calif., March 21, 2022 (GLOBE NEWSWIRE) -- [AMD](#) (NASDAQ: AMD) announced the general availability of the world's first data center CPU using 3D die stacking, the [3rd Gen AMD EPYC™ processors with AMD 3D V-Cache™ technology](#), formerly codenamed "Milan-X." Built on the "Zen 3" core architecture, these processors expand the [3rd Gen EPYC CPU family](#) and can deliver up to 66 percent performance uplift across a variety of targeted technical computing workloads versus comparable, non-stacked 3rd Gen AMD EPYC processors.^{1, 2}

These new processors feature the industry's largest L3 cache,³ delivering the same socket, software compatibility and modern security features as 3rd Gen AMD EPYC CPUs while providing outstanding performance for technical computing workloads such as computational fluid dynamics (CFD), finite element analysis (FEA), electronic design automation (EDA) and structural analysis. These workloads are critical design tools for companies that must model the complexities of the physical world to create simulations that test and validate engineering designs for some of the world's most innovative products.

"Building upon our momentum in the data center as well as our history of industry-firsts, 3rd Gen AMD EPYC processors with AMD 3D V-Cache technology showcase our leadership design and packaging technology enabling us to offer the industry's first workload-tailored server processor with 3D die stacking technology," said Dan McNamara, senior vice president and general manager, Server Business Unit, AMD. "Our latest processors with AMD 3D V-Cache technology provide breakthrough performance for mission-critical technical computing workloads leading to better designed products and faster time to market."

"Customers' increased adoption of data-rich applications requires a new approach to data center infrastructure. Micron and AMD share a vision of delivering full capability of leading DDR5 memory to high-performance data center platforms," said Raj Hazra, senior vice president and general manager of the Compute and Networking Business Unit at Micron. "Our deep collaboration with AMD includes readying AMD platforms for Micron's latest DDR5

solutions as well as bringing 3rd Gen AMD EPYC processors with AMD 3D V-Cache technology into our own data centers, where we are already seeing up to a 40% performance improvement over 3rd Gen AMD EPYC processors without AMD 3D V-Cache on select EDA workloads.”

Leading Packaging Innovations

Cache size increases have been at the forefront of performance improvement, particularly for technical computing workloads relying heavily on large data sets. These workloads benefit from increased cache size, however 2D chip designs have physical limitations on the amount of cache that can effectively be built on the CPU. AMD 3D V-Cache technology solves these physical challenges by bonding the AMD “Zen 3” core to the cache module, increasing the amount of L3 while minimizing latency and increasing throughput. This technology represents an innovative step forward in CPU design and packaging and enables breakthrough performance in targeted technical computing workloads.

Breakthrough Performance

The world’s highest performance server processors for technical computing,⁴ the 3rd Gen AMD EPYC processors with AMD 3D V-Cache technology deliver faster time-to-results on targeted workloads, such as:

- EDA – The 16-core, AMD EPYC™ 7373X CPU can deliver up to 66 percent faster simulations on Synopsys VCS™, when compared to the EPYC 73F3 CPU.⁵
- FEA – The 64-core, AMD EPYC 7773X processor can deliver, on average, 44 percent more performance on Altair® Radioss® simulation applications compared to the competition’s top of stack processor.⁶
- CFD – The 32-core AMD EPYC 7573X processor can solve an average of 88 percent more CFD problems per day than a comparable competitive 32-core count processor, while running Ansys® CFX®.⁷

These performance capabilities ultimately enable customers to deploy fewer servers and reduce power consumption in the data center, helping to lower total cost of ownership (TCO), reduce carbon footprint and address their environmental sustainability goals. For instance, in a typical data center scenario running 4600 jobs per day of the Ansys® CFX® test case cfx-50, using 2P 32-core AMD EPYC 7573X CPU based servers can reduce the estimated number of servers required from 20 to 10 and lower power consumption by 49 percent, when compared to the competition’s latest 2P 32-core processor-based server. This ends up providing a projected 51 percent lower TCO over three-years.

In other words, choosing 3rd Gen AMD EPYC processors with AMD 3D V-Cache technology in this deployment would have the environmental sustainability benefit of more than 81 acres of US forest per year in carbon sequestered equivalents.⁸

3rd Gen AMD EPYC processor with AMD 3D V-Cache Technology Product Chart

Cores	Model	# CCD	TDP (W)	cTDP range (W)	Base Freq (GHz)	Max Boost Freq (Up to GHz)*	L3 Cache (MB)	DDR Channels	Price (1KU)
64	7773X	8	280	225 – 280	2.20	3.50	768	8	\$ 8,800
32	7573X	8	280	225 – 280	2.80	3.60	768	8	\$ 5,590
24	7473X	8	240	225 – 280	2.80	3.70	768	8	\$ 3,900
16	7373X	8	240	225 – 280	3.05	3.80	768	8	\$ 4,185

*Max boost for AMD EPYC processors is the maximum frequency achievable by any single core on the processor under normal operating conditions for server systems.

Industry-wide Ecosystem Support

3rd Gen AMD EPYC processors with AMD 3D V-Cache technology are available today from a wide array of OEM partners, including, Atos, Cisco, Dell Technologies, Gigabyte, HPE, Lenovo, QCT, and Supermicro.

3rd Gen AMD EPYC processors with AMD 3D V-Cache technology are also broadly supported by AMD software ecosystem partners, including, Altair, Ansys, Cadence, Dassault Systèmes, Siemens, and Synopsys.

[Microsoft Azure HBv3 virtual machines](#) (VMs) have now been fully upgraded to 3rd Gen AMD EPYC with AMD 3D V-Cache technology. According to Microsoft, HBv3 VMs are the fastest adopted addition to the Azure HPC platform ever and have seen performance gains of up to 80 percent in key HPC workloads from the addition of AMD 3D V-Cache compared to the previous HBv3 series VMs.

Watch the video announcement [here](#) and visit the landing page for [3rd Gen AMD EPYC processors with AMD 3D V-Cache technology](#) to learn more and read about what AMD customers have to say, [here](#).

Supporting Resources

- Learn more about [AMD EPYC™ processors with AMD 3D V-Cache technology™](#)
- Learn more about [AMD EPYC™ processors](#)
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About AMD

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¹ MLNX-021B: AMD internal testing as of 02/14/2022 on 2x 64C EPYC 7773X compared to 2x 64C EPYC 7763 using cumulative average of each of the following benchmark's maximum test result score: ANSYS® Fluent® 2022.1 (max is fluent-pump2 82%), ANSYS® CFX® 2022.1 (max is cfx_10 61%), and Altair® Radioss® 2021.2 (max is rad-neon 56%) plus 1x 16C EPYC 7373X compared to 1x 16C EPYC 75F3 on Synopsys VCS 2020 (max is AMD graphics core 66%). Results may vary.

² "Technical Computing" or "Technical Computing Workloads" as defined by AMD can include: electronic design automation, computational fluid dynamics, finite element analysis, seismic tomography, weather forecasting, quantum mechanics, climate research, molecular modeling, or similar workloads. GD-204

³ EPYC-024A: 3rd Gen AMD EPYC™ CPUs with AMD 3D V-Cache™ technology have 768MB total L3 cache compared to a maximum L3 cache size of 60MB on only one 3rd Gen Intel Xeon processor (Platinum 8380) and compared to all other commercial CPUs in the market. Other L3 cache sizes:

Ampere Altra Max 16MB SLC

SPARC64 XII 32MB

POWER10 120MB

⁴ MLNX-032: World's highest performance x86 server CPU for technical computing comparison based on AMD internal testing as of 2/14/2022 measuring the score, rating or jobs/day for each of estimated SPECrate®2017_fp_base, Ansys Fluent, Altair Radioss and Ansys LS-Dyna application test case simulations average speedup on 2P servers running 32-core EPYC 7573X to 2P servers running 32-core Intel Xeon Platinum 8362 for per-core performance leadership and on 2P servers running top-of-stack 64-core EPYC 7773X to 2P servers running top-of-stack 40-core Intel Xeon Platinum 8380 for density performance leadership. See www.spec.org for more information. Results may vary based on factors including silicon version, hardware and software configuration and driver versions. SPEC®, SPECrate® and SPEC CPU® are registered trademarks of the Standard Performance Evaluation Corporation.

⁵ MLNX-001A: EDA RTL Simulation comparison based on AMD internal testing completed on 9/20/2021 measuring the average time to complete a test case simulation. comparing: 1x 16C EPYC™ 7373X with AMD 3D V-Cache Technology versus 1x 16C AMD EPYC™ 73F3 on the same AMD "Daytona" reference platform. Results may vary based on factors including silicon version, hardware and software configuration and driver versions.

⁶ MLNX-016: Altair® Radioss® 2021.2 comparison based on AMD internal testing as of 02/14/2022 measuring the time to run the dropsander, neon, and t10m test case simulations. Configurations: 2x 64C AMD EPYC 7773X with AMD 3D V-Cache™ versus 2x 40C Intel® Xeon® Platinum 8380. neon is the max result. Results may vary based on factors including silicon version, hardware and software configuration and driver versions.

⁷ MLNX-010A: ANSYS® CFX® 2022.1 comparison based on AMD internal testing as of 02/14/2022 measuring the average time to run the cfx_10, cfx_50, cfx_100, cfx_lmans, and cfx_pump test case simulations. Configurations: 2x 32C AMD EPYC™ 7573X with AMD 3D V-Cache technology™ versus 2x 32C Intel Xeon Platinum 8362. Cfx_10 is the max result. Results may vary based on factors including silicon version, hardware and software configuration and driver versions.

⁸ MLNXTCO-007: To run 4600 airfoil_50M benchmarks per day with Ansys® CFX® it takes an estimated 10 2P AMD EPYC™ 7573X powered servers or 20 2P Intel® Platinum 8362 based servers. The EPYC 7573X solution has an estimated 50% fewer servers; 50% less RU space; 49% less power, with an estimated 50% lower 3-year TCO which includes both OS and application software. The EPYC 7573X solution saves an estimated 203.19 Metric Tons of CO2 which is an estimated equivalent carbon sequestration of 81 acres of US forests annually.

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