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New 2nd Gen AMD EPYC™ Processors Redefine Performance for Database, Commercial HPC and Hyperconverged Workloads

— Dell EMC, HPE, Lenovo, Nutanix, Supermicro and other OEMs add support for new AMD EPYC™ 7Fx2 Processors across more than 80 platforms, providing 2nd Gen AMD EPYC customers with more choices for more workloads —

— IBM Cloud launches new bare metal server offering based on latest 2nd Gen EPYC processors —

SANTA CLARA, Calif., April 14, 2020 (GLOBE NEWSWIRE) -- AMD (NASDAQ: AMD) today announced it is extending the 2nd Gen AMD EPYC™ processor family with three new processors that combine the balanced and efficient AMD Infinity architecture with higher speed "Zen 2" cores for optimal performance on database, commercial high-performance computing (HPC) and hyperconverged infrastructure workloads.

The three new processors, the AMD EPYC™ 7F32 (8 cores), EPYC™ 7F52 (16 cores) and EPYC™ 7F72 (24 cores), expand 2nd Gen AMD EPYC performance leadership into workloads that can leverage up to 500 MHz of additional base frequency, and large amounts of cache, making AMD EPYC™ the world's highest per core performance x86 server CPU*.[i]

The AMD EPYC 7Fx2 processors provide new performance capabilities for workloads in the heart of the enterprise market including database with up to 17% higher SQL Server® performance[ii] compared to the competition, hyperconverged infrastructure with up to 47% higher VMmark® 3.1 score (using vSAN™ as the storage tier in a 4-node cluster) compared to the competition for a new world record[iii], and commercial high-performance computing (HPC) with up to 94% higher per core computational fluid dynamics individual application performance[iv] compared to the competition.

"AMD EPYC continues to redefine the modern data center, and with the addition of three powerful new processors we are enabling our customers to unlock even better outcomes at the heart of the enterprise market," said Dan McNamara, senior vice president and general manager, server business unit, AMD. "With our trusted partners, together we are pushing the limits of per core performance and value in hyperconverged infrastructure, commercial HPC and relational database workloads."

A Balanced System That's More than Gigahertz

The new 2nd Gen AMD EPYC 7Fx2 processors provide leading per core performance and breakthrough value, while adding the highest per core performance of the EPYC family.

The performance of these new processors comes from a balanced architecture that combines high-performance “Zen 2” cores, innovations in system design like PCIe® 4 and DDR4-3200 memory[v], and the AMD Infinity architecture, to provide customers with optimum system performance that enables better real world application performance.

Details of the new processors are below.

Processor	Cores /Threads	TDP (Watts)	Base Freq/ Max Boost Freq[vi]	Total L3 Cache	L3 Cache per Core	Price (1Ku)
7F32	8/16	180W	3.7 GHz/~3.9 GHz	128MB	16MB	$ 2,100
7F52	16/32	240W	3.5 GHz/~3.9 GHz	256MB	16MB	$ 3,100
7F72	24/48	240W	3.2 GHz/~3.7 GHz	192MB	8MB	$ 2,450

Ecosystem Growing with AMD EPYC

The ecosystem of OEMs, cloud providers, ISVs and IHVs using 2nd Gen AMD EPYC processors continues to grow, with existing OEMs and new partners adopting the new AMD EPYC 7Fx2 processors.

- **Dell Technologies** will support all three processors across its entire lineup of AMD EPYC based Dell EMC PowerEdge servers, including the R6525 which holds a world record 2P Four-Node Benchmark Result on VMmark® 3 with VMware vSAN™[vii]. “These new AMD EPYC 7Fx2 processors enable Dell EMC PowerEdge servers to drive substantial performance benefits for customer business applications like database and hyperconverged infrastructure, where Dell EMC PowerEdge servers hold a world record in benchmark performance. Our customers will truly benefit from these new processors as we continue to grow our AMD EPYC family of PowerEdge platforms.” – Rajesh Pohani, vice president, Server Platform Product Management, Dell Technologies
- **HPE** continues to expand its offerings using 2nd Gen AMD EPYC processors with latest support of HPE SimpliVity, an intelligent hyper-converged infrastructure solution. HPE will also support all three AMD EPYC 7Fx2 processors on the recently announced HPE Apollo 2000 Gen10 Plus system, HPE ProLiant DL385 Gen10 Plus server and HPE ProLiant DX servers. “We are pleased to expand support of the 2nd Gen AMD EPYC processors across our portfolios, which include new additions with the HPE Apollo 2000 Gen10 Plus system, HPE ProLiant DL385 Gen10 Plus server and HPE ProLiant DX servers to meet high-frequency and performance needs for our customers in high-performance computing and database environments.” – Peter Ungaro, senior vice president and general manager, HPC and Mission Critical Solutions (MCS), at HPE
- **IBM Cloud** is the first cloud provider to offer its clients the AMD EPYC 7F72 processors in their bare metal offering, providing access to fast, high core-count dual socket bare metal servers. Additionally, IBM recently announced the availability of its first bare metal server powered by the AMD EPYC 7642 processor. “We are excited to be the first cloud provider to support the new AMD EPYC 7F72 processor. Now, IBM Cloud provides access to another high core-count dual socket bare metal server with high clock speed frequency, giving our clients more optimized platform choices for compute-intense workloads such as analytics, commercial HPC and EDA. We stay committed to enabling flexible and powerful bare metal experiences for clients to enhance performance and throughput.” – Satinder Sethi, general manager, IBM Cloud Infrastructure Services

- **Lenovo** will support the new AMD EPYC 7Fx2 processors on its ThinkSystem SR635 and SR655 platforms. These ThinkSystem platforms are already a great choice for a variety of enterprise workloads including data analytics, software defined storage and infrastructure for remote workers. Lenovo's storage and PCIe capabilities coupled with AMD EPYC core count and I/O density will help provide customers with choice as their business needs evolve. These new higher frequency 2nd Gen AMD EPYC processors, with an increased core clock speed up to 15%, in the single socket ThinkSystem platform, provides customers with greater options for workloads where per core performance is critical. Lenovo's one socket optimized platforms with these new processors allow customers to deploy these platforms where traditionally two socket systems were used, providing power and SW licensing costs savings**.** "Today's business dynamics are presenting customers with new challenges to improve speed, cost and performance. We feel confident we have the right portfolio to provide our customers with enhanced choice as organizations look to enable remote working capabilities and manage their increased data and storage requirements." – Kamran Amini, vice president and general manager, Server, Storage and Software Defined Infrastructure, Lenovo Data Center Group
- **Microsoft** recognizes the impact the new AMD EPYC 7Fx2 processors have on providing Microsoft data platform customers the best experience possible, including an up to 17% higher SQL Server[viii]® TPM per core performance. "Microsoft data platform solutions help customers release the potential hidden in data and reveal insights and opportunities to transform a business. A critical part of this process is making sure a database has access to an efficient, powerful and fast processor and that's exactly what the new AMD EPYC 7Fx2 processors provide Microsoft data platform solutions customers." – Jamie Reding, SQL Server program manager, Microsoft
- **Nutanix**, in conjunction with Hewlett Packard Enterprise, announced that it expects that Nutanix HCI software will be supported on select AMD EPYC based HPE ProLiant servers by May. As well, HPE announced the upcoming availability of AMD EPYC 7Fx2 processors on HPE ProLiant DX servers in Q3. "We are excited to have validated Nutanix's HCI software for 2nd Gen AMD EPYC processor based HPE ProLiant systems. This will bring 2nd Gen AMD EPYC processor support to Nutanix software, giving more flexibility and choice to our customers while unleashing greater workload performance for databases, analytics, VDI and other virtualized business critical applications." – Tarkan Maner, chief commercial officer, Nutanix
- **Supermicro** is launching the industry's first blade platform built for 2nd Gen AMD EPYC processors with immediate support for the new AMD EPYC 7Fx2 processors combined with integrated 25G Ethernet and optional 100G EDR InfiniBand support with 200G HDR in the near future. In addition, all Supermicro A+ platforms including Ultra, GPU, WIO, Twin and Mainstream systems will support the new AMD EPYC 7Fx2 processors immediately. "Adding the new SuperBlade® platform to our extensive portfolio of products supporting the 2nd Gen AMD EPYC processors gives our customers another powerful choice when redefining their modern data center. Leveraging support for the new AMD EPYC 7Fx2 processors, our latest SuperBlade and Supermicro A+ platforms further excel at database, EDA and other data-intensive workloads." – Vik Malyala, senior vice president, Field Application Engineering & Business Development, Supermicro
- **VMware**, a leading innovator in enterprise software, is pleased to add support for the new 2nd Gen AMD EPYC 7Fx2 processors, enabling customers access to powerful virtualization platforms. "The 2nd Gen AMD EPYC 7Fx2 processors bring new value to

VMware customers. They provide a unique balance of strong per core performance coupled with an industry-leading per-processor memory capacity of 4TB. A key element of VMware vSphere, vSAN, and now VMware Cloud Foundation market success has been our commitment to helping customers quickly adopt the latest hardware innovation." – Richard A. Brunner, chief technology officer, Server Platform Technologies, VMware

The new processors are available now through multiple OEMs and IBM Cloud. You can learn more about where to get systems with the new processors here.

Additional Resources

- Learn more about 2nd Gen AMD EPYC Processors
- Learn more about software and workload support for the AMD EPYC 7Fx2 processors from the AMD blog
- Learn more from Micron about their views and experiences with the AMD EPYC 7Fx2 processors
- Follow AMD data center developments on Twitter @AMDServer

About AMD
For more than 50 years AMD has driven innovation in high-performance computing, graphics and visualization technologies — the building blocks for gaming, immersive platforms and the data center. Hundreds of millions of consumers, leading Fortune 500 businesses and cutting-edge scientific research facilities around the world rely on AMD technology daily to improve how they live, work and play. AMD employees around the world are focused on building great products that push the boundaries of what is possible. For more information about how AMD is enabling today and inspiring tomorrow, visit the AMD (NASDAQ:AMD) website, blog, Facebook and Twitter pages.

Cautionary Statement
This press release contains forward-looking statements concerning Advanced Micro Devices, Inc. (AMD) including the features, functionality, availability, timing and expectations of the 2nd Gen AMD EPYC™ processors, including expectations with existing OEMs and new partners, which are made pursuant to the Safe Harbor provisions of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are commonly identified by words such as "would," "intends," "believes," "expects," "may," "will," "should," "seeks," "intends," "plans," "pro forma," "estimates," "anticipates," or the negative of these words and phrases, other variations of these words and phrases or comparable terminology. Investors are cautioned that the forward-looking statements in this document are based on current beliefs, assumptions and expectations, speak only as of the date of this document and involve risks and uncertainties that could cause actual results to differ materially from current expectations. Such statements are subject to certain known and unknown risks and uncertainties, many of which are difficult to predict and generally beyond AMD's control, that could cause actual results and other future events to differ materially from those expressed in, or implied or projected by, the forward-looking information and statements. Material factors that could cause actual results to differ materially from current expectations include, without limitation, the following: Intel Corporation's dominance of the microprocessor market and its aggressive business practices may limit AMD's ability to compete effectively; AMD relies on third parties to manufacture its products, and if they are unable to do so on a timely basis in sufficient quantities and using competitive technologies, AMD's business could be

materially adversely affected; failure to achieve expected manufacturing yields for AMD's products could negatively impact its financial results; the success of AMD's business is dependent upon its ability to introduce products on a timely basis with features and performance levels that provide value to its customers while supporting and coinciding with significant industry transitions; if AMD cannot generate sufficient revenue and operating cash flow or obtain external financing, it may face a cash shortfall and be unable to make all of its planned investments in research and development or other strategic investments; the loss of a significant customer may have a material adverse effect on AMD; AMD's receipt of revenue from its semi-custom SoC products is dependent upon its technology being designed into third-party products and the success of those products; global economic uncertainty may adversely impact AMD's business and operating results; AMD's operations are subject to political, legal and economic risks and natural disasters which could have a material adverse effect on AMD; government actions and regulations such as export administration regulations, tariffs and trade protection measures, may limit AMD's ability to export its products to certain customers; AMD products may be subject to security vulnerabilities that could have a material adverse effect on AMD; IT outages, data loss, data breaches and cyber-attacks could compromise AMD's intellectual property or other sensitive information, be costly to remediate and cause significant damage to its business and reputation; AMD has a wafer supply agreement with GF with obligations to purchase all of its microprocessor and APU product requirements, and a certain portion of its GPU product requirements, from GLOBALFOUNDRIES Inc. (GF) with limited exceptions. If GF is not able to satisfy AMD's manufacturing requirements, its business could be adversely impacted; uncertainties involving the ordering and shipment of AMD's products could materially adversely affect it; AMD's operating results are subject to quarterly and seasonal sales patterns; the agreements governing AMD's notes and the Secured Revolving Line of Credit impose restrictions on AMD that may adversely affect its ability to operate its business; the markets in which AMD's products are sold are highly competitive; the conversion of the 2.125% Convertible Senior Notes due 2026 may dilute the ownership interest of its existing stockholders, or may otherwise depress the price of its common stock; the demand for AMD's products depends in part on the market conditions in the industries into which they are sold. Fluctuations in demand for AMD's products or a market decline in any of these industries could have a material adverse effect on its results of operations; AMD's ability to design and introduce new products in a timely manner is dependent upon third-party intellectual property; AMD depends on third-party companies for the design, manufacture and supply of motherboards, software and other computer platform components to support its business; if AMD loses Microsoft Corporation's support for its products or other software vendors do not design and develop software to run on AMD's products, its ability to sell its products could be materially adversely affected; and AMD's reliance on third-party distributors and AIB partners subjects it to certain risks. Investors are urged to review in detail the risks and uncertainties in AMD's Securities and Exchange Commission filings, including but not limited to AMD's Annual Report on Form 10-K for the year ended December 28, 2019.

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***AMD EPYC™ 7F32 SPECrate®2017_fp_base score**

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[i] Highest per core performance in the world based on EPYC 7F32 (8-cores) having the highest SPECrate®2017_fp_base score divided by total core count, of all SPEC® publications as of 4/14/2020. 2x EPYC 7F32 (8-cores) scoring 12.75 base result per core (204 SPECrate®2017_fp_base/16 total cores, www.spec.org/cpu2017/results/res2020q2/cpu2017-20200316-21244.pdf) compared to the next highest result 1x AMD EPYC 7262 (8-cores) scoring 11.54 base result per core (92.3 SPECrate®2017_fp_base/8 total cores, http://spec.org/cpu2017/results/res2020q1/cpu2017-20191220-20435.pdf) See www.spec.org/cpu2017/results for full ranking. SPEC® and SPECrate® are trademarks of the Standard Performance Evaluation Corporation. Learn more at www.spec.org ROM-570

[ii] Testing as of 3.20.2020 by AMD Performance Labs. Up to 17% higher SQL Server® tpm per core. Configurations: HammerDB 3.3 (TPC-C® profile - The workload is derived from the TPC-C Benchmark, and as such is not comparable to published TPC-C Benchmark results, as the OLTP workload results do not comply with the TPC-C benchmark). 2x EPYC 7F52 (32C total) scoring 4,872,975 tpm (152,280 tpm per core). 2x Xeon Gold 6244 (32C total) scoring 4,178,963 tpm (130,584 tpm per core). Results may vary. ROM-571

[iii] 47% higher score amd 56% more tiles (VMs) based on VMmark® 3.1 vSAN™ comparing 2x EPYC 7F72 scoring 13.27 @ 14 tiles (266 VMs), https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/vmmark/2020-04-14-DellEMC-PowerEdge-R6525.pdf compared to the next highest competitive result on 2x Intel® Xeon® Platinum 8276L scoring 9.00 @ 9 tiles (171 VMs), https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/vmmark/2019-08-12-Hitachi-UCPHC-V124N.pdf). 47% higher score = 13.27/9 = 1.474x the score and 56% more tiles (VMs) = 14/9=1.555x the tiles (VMs) as of 4/14/20. VMmark® is a product of VMware, Inc. ROM-639

[iv] Based on AMD internal testing of ANSYS® CFX® 2019 R1 running Release 14.0 test cases as of 3/24/2020 on a 2x EPYC 7F52 (16C) powered reference server versus a 2x Intel Xeon Gold 6242 (16C) powered server. Results may vary. ROM-590

[v] Some supported features and functionality of 2nd Gen AMD EPYC™ processors require a BIOS update from your server manufacturer when used with a motherboard designed for the 1st Gen AMD EPYC series processor. A motherboard designed for 2nd Gen EPYC processors is required to enable all available functionality. ROM-06

[vi] 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. EPYC-18

[vii] 47% higher score amd 56% more tiles (VMs) based on VMmark® 3.1 vSAN™ comparing 2x EPYC 7F72 scoring 13.27 @ 14 tiles (266 VMs),

https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/vmmark/2020-04-14-DellEMC-PowerEdge-R6525.pdf compared to the next highest competitive result on 2x Intel® Xeon® Platinum 8276L scoring 9.00 @ 9 tiles (171 VMs), https://www.vmware.com/content/dam/digitalmarketing/vmware/en/pdf/vmmark/2019-08-12-Hitachi-UCPHC-V124N.pdf). 47% higher score = 13.27/9 = 1.474x the score and 56% more tiles (VMs) = 14/9=1.555x the tiles (VMs) as of 4/14/20. VMmark® is a product of VMware, Inc. ROM-639

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