June 28, 2021

AMD Leads High Performance Computing Towards Exascale and Beyond

— Adoption of AMD EPYC processors in Top500 list of world's fastest supercomputers accelerates; number of AMD-powered systems doubles since November and EPYC processors power half of the newly ranked systems —

— AMD EPYC™ processors and AMD Instinct™ accelerators enabling engineering breakthroughs and powering research addressing the world's most complex scientific challenges —

SANTA CLARA, Calif., June 28, 2021 (GLOBE NEWSWIRE) -- At this year's International Supercomputing 2021 digital event, AMD (NASDAQ: AMD) is showcasing momentum for its AMD EPYC™ processors and AMD Instinct™ accelerators across the High Performance Computing (HPC) industry. The company also outlined updates to the ROCm™ open software platform and introduced the AMD Instinct™ Education and Research (AIER) initiative. The latest Top500 list showcased the continued growth of AMD EPYC processors for HPC systems. AMD EPYC processors power nearly 5x more systems compared to the June 2020 list, and more than double the number of systems compared to November 2020. As well, AMD EPYC processors power half of the 58 new entries on the June 2021 list.

"High performance computing is critical to addressing the world's biggest and most important challenges," said Forrest Norrod, senior vice president and general manager, data center and embedded systems group, AMD. "With our AMD EPYC processor family and Instinct accelerators, AMD continues to be the partner of choice for HPC. We are committed to enabling the performance and capabilities needed to advance scientific discoveries, break the exascale barrier, and continue driving innovation."

AMD HPC Momentum Continues
With the recent launch of the AMD EPYC 7003 Series processor, which provides industry leading performance for HPC workloads[i], AMD is continuing to enable its partners and customers to deploy all sizes of clusters, across key research areas including manufacturing, life sciences, financial services, climate research and more.

A 2020 Intersect360 perception study of HPC users' impressions of CPUs showed that AMD EPYC processors had a 78 percent favorable impression amongst respondents, growing from 36 percent in 2016[ii]. In a 2021 study from Intersect360 asking HPC institutions about AMD EPYC penetration within their sites, 23 percent of respondents said they have broad usage of AMD EPYC processors, and an additional 47 percent said they are testing or using AMD EPYC processors at some level[iii].

Recent systems utilizing AMD HPC solutions include:

- Bulgaria's EuroHPC Atos BullSequana XH2000 supercomputer, powered by AMD EPYC processors for scientific development in bioinformatics, pharmacy, artificial

intelligence, meteorology and more.

- The University of Cambridge's Cambridge Service for Data Driven Discovery (CSD3) system, with Dell EMC PowerEdge XE8545 servers powered by 3rd Gen AMD EPYC processors.
- Durham University's COSMA8 supercomputer with Dell EMC PowerEdge C6525 servers powered by 2nd and 3rd Gen AMD EPYC processors.
- Microsoft Azure supercomputers for UK Met Office using 3rd Gen AMD EPYC processors and next generation AMD EPYC processors in an HPE Cray EX supercomputer, delivering an expected 60 petaflops of advanced supercomputing capabilities for weather and climate research.
- National Center for Atmospheric Research's supercomputer, powered by 3rd Gen AMD EPYC processors and the HPE Cray EX supercomputer, supporting the nation's advanced research and understanding of geosciences.
- The *Perlmutter* supercomputer from the National Energy Research Scientific Computing Center (NERSC) and Lawrence Berkeley National Laboratory features nodes that include 3rd Gen AMD EPYC processors in an HPE Cray EX supercomputer that provides four times the computational power currently available at NERSC.
- The Singapore National Supercomputing Centre supercomputer**,** built by HPE, powered by 3rd Gen AMD EPYC processors and expected to have a peak theoretical performance of 10 petaflops.

Updates to AMD ROCm™ Software Support

AMD is introducing its new AMD Instinct Education and Research (AIER) initiative, designed to help scientists, researchers and academics accelerate the performance of their code on AMD Instinct Accelerators. The AIER initiative, based on member requirements, offers remote access to AMD Instinct technologies, the AMD ROCm Learning Center, and ROCm software and support as well as access to technical guidance on AMD software and hardware solutions. In addition to regional Solution Partners, AIER Global Solution Partners include Dell Technologies, Gigabyte, Hewlett Packard Enterprise, and Supermicro.

The ROCm open software platform continues to gain industry support and momentum with a growing list of applications, third-party libraries, and frameworks supporting AMD accelerators. The HPC community has embraced HIP as a heterogenous programming model, that developers use to write or adapt their codes to for acceleration on AMD's GPUs including Gromacs, TensorFlow, and GridTools.

Additionally, PyTorch for ROCm is now available as an installable Python package and includes full capability for mixed-precision and large-scale training using AMD's MIOpen and RCCL (communications) libraries. This innovation provides a new option for data scientists, researchers, students, and others in the community to get started with accelerated PyTorch using AMD GPUs. Most recently, CuPy, an open-source array library with Python, has expanded its traditional GPU support with the introduction of version 9.0 that now offers support for the ROCm stack for GPU-accelerated computing.

Commitment to Advancing Research

Last year, AMD announced its HPC Fund for COVID-19 research, which included a donation of systems powered by AMD EPYC processors and AMD Instinct accelerators to provide researchers with petaflop-scale compute power to fight the pandemic. With over 12 petaflops of capacity awarded to-date, AMD has since delivered HPC capabilities to 23 institutions across seven countries including Massachusetts Institute of Technology (MIT),

New York University (NYU), Rice University, University of Texas at Austin and University of Toronto.

“From COVID-19 research to analyzing genome architectures, AMD CPU and GPU processors help the Center for Theoretical Biological Physics to run some codes from 1,000 to 10,000 times faster than before,” said Peter Rossky, the Harry C and Olga K. Wiess Professor of Natural Sciences. “The ability to run parallel simulations on this game-changing equipment enables the full analysis of one chromosome in as little as 20 minutes – research that used to take up to a month to complete. These accomplishments come just months after adding the high-performance computing capabilities from AMD, and we expect adoption across our researcher community to grow exponentially.”

Visit the AMD virtual booth at ISC 21 to learn more about AMD solutions for HPC and talk with AMD experts.

Supporting Resources

- See demos, videos and more about the AMD EPYC 7003 series processors
- Read more about AMD Exascale Computing Technologies and AMD HPC Solutions
- Find out more about the AIER initiative in the brochure
- Discover more on the AMD ROCm open software platform
- Follow AMD and AMD Server on Twitter

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 datacenter. 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.

AMD, the AMD Arrow logo EPYC, AMD Instinct and ROCm are trademarks of Advanced Micro Devices, Inc. Other names are for informational purposes only and may be trademarks of their respective owners.

[i] MLN-086A: SPECrate®2017_fp_base comparison based on best performing systems published at www.spec.org as of 04/28/2021. Configurations: 2x AMD EPYC 7763 (651 SPECrate®2017_fp_base, http://spec.org/cpu2017/results/res2021q1/cpu2017-20210219-24944.html) versus 2x Intel Xeon Platinum 8368Q (477 SPECrate®2017_fp_base, http://spec.org/cpu2017/results/res2021q2/cpu2017-20210330-25511.html) for ~36.5% more performance. SPEC®, SPEC CPU®, and SPECrate® are registered trademarks of the Standard Performance Evaluation Corporation. See www.spec.org for more information.

[ii] Intersect360 Research data from multiple studies. 2016: Special study: “Processing Elements for HPC”; question, “Overall, how favorable is your forward-looking impression of each of the following, with respect to your HPC workloads? (1 = Completely unfavorable; 5 = completely favorable)”; scores are combined percentage 4 and 5 for AMD Opteron versus Intel Xeon. 2020: “Vendor Satisfaction and Loyalty in HPC”; question, “What is your impression of each of the following vendors' future prospects for HPC?” (five-point scale); scores are combined top-two responses (Very Impressed; Impressed) for AMD EPYC CPUs

versus Intel Xeon CPUs.

[iii] Intersect360 Research HPC Technology Survey, 2021.

Contact:
Aaron Grabein
AMD Communications
(512) 602-8950
aaron.grabein@amd.com

Laura Graves
AMD Investor Relations
(408) 749-5467
laura.graves@amd.com



Source: Advanced Micro Devices, Inc.