PERFORMANCE BRIEF **AUGUST 2019**

AMD EPYC™ 7002 SERIES PROCESSORS ACHIEVE NEW WORLD RECORD ON INDUSTRY-STANDARD DECISION SUPPORT SYSTEM BENCHMARK

Performance Leadership

AMD is committed to industry standard benchmarks. 2nd Gen AMD EPYC processors demonstrate their leadership in Decision Support Systems (DSS) with Apache Hadoop® based big data implementations with world record TPC-DS benchmark results at the 10 TB scale factors[1].

x86 Compatibility

Continuing AMD's commitment to industry standards, AMD EPYC™ 7002 generation processors offer you a choice in x86 architecture. x86 compatibility means you can run most x86 based applications on AMD EPYC processors.

Commitment to Industry Standards

AMD is committed to industry standard benchmarks and enabling fair competition. AMD is a proud member of TPC®, SPEC® and other industry standard consortia. These organizations help drive innovation, enabling the creation of more powerful and energy-efficient systems, while giving customers the information they need to make data-driven decisions about their purchases.

Broad Partner Ecosystem

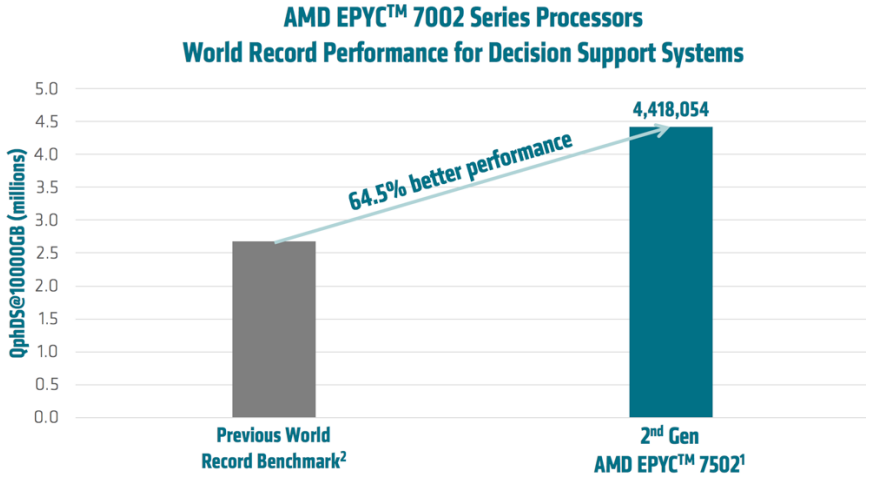
AMD's broad partner ecosystem and collaborative engineering provide tested and validated solutions that help lower your risk and total cost of ownership.

Exceptional Scalability

AMD EPYC 7002 Series processors provide high bandwidth between nodes with support for PCIe® Gen 4 enabled network devices.[5] Within node, take advantage of up to 64 cores and 8 high-speed memory channels - the AMD EPYC 7002 series delivers exceptional performance and scalability for big data applications.

2nd Gen AMD EPYC™ Processors Set Decision Support System World Record with TPC Benchmark® DS

The TPC Benchmark® DS (TPC-DS) is a decision support benchmark that models several generally applicable aspects of a decision support system, including queries and data maintenance. The benchmark provides a representative evaluation of performance as a general-purpose decision support system.



A benchmark result measures query response time in single user mode, query throughput in multi-user mode and data maintenance performance for a given hardware, operating system, and data processing system configuration under a controlled, complex, multi-user decision support workload. The purpose of TPC benchmarks is to provide relevant, objective performance data to industry users. They enable performance and price-performance comparisons in a technically rigorous, directly comparable, and vendor-neutral manner.

AMD EPYC processor-based systems continue to demonstrate industry leadership in performance and price-performance. AMD EPYC 7002 processors set a new standard for performance and scalability with **a world record** TPC-DS benchmark result at the 10 TB scale factor[1].

AMD EPYC SoCs help you optimize the compute power for your application. Incredibly high core counts, memory capacity and bandwidth, and massive I/O help enable breakthrough performance and lower cost of ownership for many applications including big data analytics. The results speak for themselves.

Innovation Drives Advancement

The AMD EPYC processor represents a completely new approach to supporting the massive processing requirements of the modern datacenter. The second generation of the AMD EPYC™ processor extends AMD's innovation leadership while continuing the philosophy of choice without restriction.

Unmatched Flexibility

Match core count with application needs without compromising processor features. Built with leading-edge 7nm technology, the AMD EPYC™ SoC offers a consistent set of features across a range of choices from 8 to 64 cores, including 128 lanes of PCIe® Gen 4[5], 8 memory channels and access to up to 4 TB of high-speed memory. EPYC processors' balanced set of resources means more freedom to right-size the server configuration to the workload.

BENCHMARK CONFIGURATION	
Hardware	4 x Supermicro A+ Server AS-2123BT-HNCOR with 4 x 217BH-22H12 Nodes, each with: • 2 x AMD EPYC 7502P SoC (32 Cores) • 16 x 16 GB RDIMM 2666MT/s Dual Rank (256 GB) • 1 x 960 GB M.2 PCIe Gen 3 (OS) • 2 x 3.5 TB NVMe Drive (Data) • 2 x 2 TB NVMe Drive (Data) • 1 x Mellanox ConnectX-5 25GbE (Network adapter)
Software	Transwarp ArgoDB v1.2.1 Red Hat Enterprise Linux Server Release 7.6
Network	1 x Mellanox MSB7800-ES2F

Dedicated Security

AMD EPYC SoC features the industry's first hardware-embedded security processor in an x86-architecture. The processor manages secure boot, memory encryption, and secure virtualization functions on the SoC itself. Encryption keys never leave the processor where they can be exposed to intruders.

Outstanding Scalability

Scale-up or scale-out, AMD and its ecosystem partners offer high-performance network connectivity options for applications at massive scale.

Innovation, Joint Engineering and a Commitment to Open Standards

AMD is proud to continue its long tradition of innovation and commitment to open standards. Coupled with joint engineering with our OEM and software partners, we're proud to demonstrate outstanding performance at significant cost savings.

These results demonstrate how the AMD EPYC SoC is bringing a new balance to the datacenter. Utilizing x86-architecture, the AMD EPYC processor brings together high core counts, large memory capacity, ample memory bandwidth and massive I/O with the right ratios to deliver truly exceptional performance.

LEARN MORE at amd.com/epyc

2nd Gen AMD EPYC Processors: Built with leading-edge 7nm technology, the AMD EPYC SoC offers a consistent set of features across a range of choices from 8 to 64 cores, including 128 lanes of PCIe® Gen 4[5] and 8 memory channels with access to up to 4 TB of high-speed memory.

FOOTNOTES

1. As of 8/7/2019, AMD EPYC TPC-DS benchmark results at 10 TB scale factor are: 4,418,054 QphDS@10000GB, 0.12 USD per QphDS@10000GB, 8/7/2019 system availability. Full disclosure report available on the TPC website at: http://www.tpc.org/5003
2. As of 8/7/2019, previous best published TPC-DS benchmark results at 10 TB scale factor are: 2,684,357 QphDS@10000GB, 1.19 CNY per QphDS@10000GB. 4/26/2019 system availability. Full disclosure report available on the TPC website at: http://www.tpc.org/5002
3. A listing all TPC-DS 10 TB scale factor results can be found on the TPC website by clicking here.
4. The TPC believes that comparisons of TPCx-HS published at different scale factors are misleading and discourages such comparisons.
5. Some supported features and functionality of second-generation AMD EPYC™ processors (codenamed "Rome") require a BIOS update from your server manufacturer when used with a motherboard designed for the first-generation AMD EPYC 7000 series processor. A motherboard designed for "Rome" processors is required to enable all available functionality. ROM-06.