

AMD EPYC[™] 7002 SERIES PROCESSORS FOR JAVA®: WORLD RECORDS ON SPECjbb® 2015

Performance Leadership

AMD is committed to industry standard benchmarks. 2nd Gen AMD EPYC[™] processors establish their leadership in Java-based implementations with world record 2P x86 SPECjbb[®] 2015 results.¹

SPECjbb® 2015

The SPECjbb® 2015 benchmark from the Standard Performance Evaluation Corporation (SPEC) enables performance benchmarking of Java based applications. It is relevant to all audiences who are interested in Java server performance, including JVM vendors, hardware developers, Java application developers, researchers and members of the academic community.

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 datadriven decisions about their purchases.

Core Density Equals More Performance in the Same Datacenter Footprint

Performance demands are increasing; IT budgets and datacenter space are not. Built on 7nm technology, AMD EPYC[™] 7002 Series processors pack more cores and more power into the same space as the previous generation.

AMD EPYC[™] Dual Socket Server Sets x86 World Record on SPECjbb[®] 2015 Composite Benchmark

The SPECjbb[®] 2015 benchmark from the Standard Performance Evaluation Corporation (SPEC[®]) enables performance benchmarking of Java[®] based applications. It is based on a company with an IT infrastructure that handles a mix of point-of-sale requests, online purchases and data-mining operations. It is relevant to all audiences who are interested in Java server performance, including JVM vendors, hardware developers, Java application developers, researchers and members of the academic community.



AMD EPYC[™] 7002 Series Processors World Record 2P x86 Result: SPECjbb2015-Composite critical-j0PS^{1,2}

The charts above and below show the results for SPECjbb2015-Composite critical-jOPS and SPECjbb2015-Composite max-jOPS. The AMD EPYC[™] 7742 results are from a single run and set new 2P x86 world records in both categories.



AMD EPYC[™] 7002 Series Processors World Record 2P x86 Result: SPECjbb2015-Composite max-j0PS^{1,3}

AMD EPYC[™] Also Sets Dual Socket x86 MultiJVM World Records on SPECjbb 2015

While the composite benchmark has all of the benchmark components running inside a single Java Virtual Machines (JVM), for many workloads, it is important to understand performance across multiple JVMs. The SPECjbb 2015 benchmark's components can be spread across multiple JVMs and the benchmark run, providing insight into how the system performs when multiple JVMs are in use.

The charts below show the results for SPECjbb2015-MultiJVM critical-jOPS and SPECjbb2015-MultiJVM max-jOPS. As with the composite benchmark, the AMD EPYC[™] 7742 results set a new 2P x86 world record in both categories.



AMD EPYC[™] 7002 Series Processors World Record 2P x86 Result: SPECjbb2015-MultiJVM critical-j0PS^{5,7}

Figure 1: SPECjbb2015-MultiJVM critical-jOPS Results



AMD EPYC[™] 7002 Series Processors World Record 2P x86 Result: SPECjbb2015-MultiJVM max-j0PS^{6,}

Figure 2: SPECjbb2015-MultiJVM max-jOPS Results

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

SUSE Linux Enterprise Server 15 SP1 (4.12.14-195-Operating default) System Software Oracle Java SE 12.0.1 Java HotSpot 64-bit Server VM, version 12.0.1

BENCHMARK CONFIGURATION

Memory

1 x 1.9 TB SATA SSD

2 x 1 Gb LOMs

1 x Gigabyte[™] Rack Server R282-Z90, with

2 x AMD EPYC 7742 SoC (128 Cores)

1 TB 4DRx4 LRDIMM PC4-3200 (16 x 64 GB)

set of features across a range of choices from 8 to 64 cores, including 128 lanes of PCIe[®] Gen 4¹⁰ and 8 memory channels with 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.

Hardware

Confidently Implement Java-based Workloads

These 2P x86 world record SPECjbb2015-Composite and SPECjbb2015-MultiJVM results show how the 2nd Gen AMD EPYC SoC is bringing a new balance to the datacenter. Utilizing x86 architecture, the AMD EPYC SoC brings together high core counts, large memory capacity and bandwidth, and ample I/O with the right ratios to deliver exceptional performance.

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 often at significant cost savings.

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 4¹⁰ and 8 memory channels with access to up to 4 TB of high-speed memory.

FOOTNOTES

- As of 8/7/2019, AMD EPYC 7742's 2P x86 score was the highest in the following categories: SPECjbb2015-Composite critical-jOPS = 248,786; and SPECjbb2015-Composite max-jOPS = 289,416. Available here: http://spec.org/jbb2015/results/res2019g3/jbb2015-20190717-00461.html
- 2. As of 8/7/2019, best published Intel Xeon Platinum 8280 2P x86 SPECjbb2015-Composite critical-jOPS score is: 139,541. Available here: <u>https://spec.org/jbb2015/results/res2019q2/jbb2015-20190314-00413.html</u>
- 3. As of 8/7/2019, best published Intel Xeon Platinum 8280 2P x86 SPECjbb 015-Composite max-jOPS score is: 167,280. Available here: <u>https://spec.org/jbb2015/results/res2019q2/jbb2015-20190313-00389.html</u>
- 4. A listing of all SPECjbb2015-Composite results can be found here: <u>https://spec.org/cgi-bin/osgresults?conf=jbb2015:op=form</u>
 - a. Sort descending by Max-jOPS or Critical-jOPS
 - b. Scroll down to the "SPECjbb2015-Composite" section
- 5. As of 8/7/2019, AMD EPYC 7742's score of 233,669 was the highest 2P x86 score on SPECjbb2015-MultiJVM critical-jOPS. Available here: <u>http://spec.org/jbb2015/results/res2019q3/jbb2015-20190717-00462.html</u>
- 6. As of 8/7/2019, AMD EPYC 7742's score of 355,121 was the highest 2P x86 score on SPECjbb2015-MultiJVM max-jOPS. Available here: <u>http://spec.org/jbb2015/results/res2019q3/jbb2015-20190717-00460.html</u>
- As of 8/7/2019, best published Intel Xeon Platinum 8280 2P x86 SPECjbb2015-MultiJVM critical-jOPS score is: 138,942. Available here: <u>https://spec.org/jbb2015/results/res2019q2/jbb2015-20190314-00428.html</u>
- As of 8/7/2019, best published Intel Xeon Platinum 8280 2P x86 SPECjbb2015-MultiJVM max-jOPS score is: 194,068. Available here: <u>https://spec.org/jbb2015/results/res2019q2/jbb2015-20190313-00374.html</u>
- 9. A listing of all dual socket SPECjbb2015-MultiJVM results can be found here: <u>https://spec.org/cgi-bin/osgresults?conf=jbb2015;op=form</u>
 - a. Set "# of chips" = 2,
 - b. Sort descending by Max-jOPS or Critical-jOPS
 - c. Make sure you are looking at the "SPECjbb2015-MulitJVM" section (it usually sorts to the top)
- 10. 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.

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