

HIGHLIGHTS

ARCHITECTURE LEADERSHIP

- **BASED ON AMD INFINITY ARCHITECTURE**, new 2nd Gen AMD EPYC™ Processors are the first server processors featuring 7nm hybrid multi-die design and PCIe® Gen4 I/O. The AMD EPYC Family continues to offer the most I/O and memory bandwidth in its class¹.

PERFORMANCE LEADERSHIP

- **WITH UP TO 64 HIGH PERFORMANCE CORES PER SOC**, 2nd Gen AMD EPYC Processors deliver world-record², best-in-class performance up to a 2.3x³ generational performance increase and outpaces 2nd Gen Intel Xeon Scalable processors by up to 102%⁴.

SECURITY LEADERSHIP

- **AMD INFINITY GUARD** helps your organization take control of security and decrease risks to your most important assets.

AMD EPYC™ 7002 Series Processors: A New Standard for the Modern Data Center

Architecture. Performance. Security Features.
AMD EPYC™ 7002 Series Processors set a new standard for the modern data center.

The demand for secure, high performance computing is driving the need for modern data centers that deliver a balanced IT infrastructure, workload acceleration, and data protection. Delivering the latest in server technology innovation, AMD EPYC™ 7002 Series processors provide businesses advanced security features and ground breaking application performance resulting in faster insights and value. Driven by the AMD Infinity Architecture, the AMD EPYC 7002 Family is the first x86-architecture server processor based on 7nm process technology, a hybrid, multi-die architecture, PCIe® Gen4 I/O, and AMD Infinity Guard security features. Together, these innovative capabilities deliver what you need - performance leadership for your workloads. Designed with security in mind, EPYC 7002 series processors help protect your CPU, applications, and data—whether in your enterprise data center or the public cloud. And with the range of features you need to power your business, you can adapt your IT infrastructure to match workload challenges you face today and into the future.

AMD EPYC INFINITY ARCHITECTURE

AMD Infinity Architecture embodies AMD's leadership philosophy in its EPYC processor designs. It is the reason that AMD EPYC processors have leaped ahead of the market again and it is the reason to expect AMD processors to stay ahead in the future. AMD EPYC 7002 Series Processors leapfrog the industry by using a 7nm process for the CPU cores and a 14nm process for I/O, memory access, and security functions. A system-on-chip (SoC) design eliminates the need for many external support chips, helping reduce capital and server design costs. An "all-in" feature set delivers a uniform set of features regardless of the number of processor cores.

PERFORMANCE LEADERSHIP

Accelerated performance comes from a commitment to greater parallelism. With up to 64 cores per SOC and "Zen 2" features, the AMD EPYC 7002 Series surpasses 1st Gen AMD EPYC Processors with improved execution pipelines, higher clock rates, and up to 4x the shared Level 3 cache. The result is more than twice the performance³ and up to 4x the theoretical peak floating point operations per second⁵ (FLOPS) when compared to 1st Gen AMD EPYC Processors. The processors score world-record performance² across major industry benchmarks including SPEC CPU® 2017, TPC®, and VMware® VMmark® 3.1.

SECURITY LEADERSHIP

AMD EPYC™ processors boast a set of advanced security features, called AMD Infinity Guard, which includes the AMD secure processor, Secure Memory Encryption (SME), and Secure Encrypted Virtualization (SEV). All of these features help minimize potential attack surfaces as software is booted and executed and processes your critical data.

AMD EPYC 7002 Series Processors



AMD EPYC 7002 SERIES PROCESSOR DETAILS

Model	Cores	Threads	Base Freq. (GHz)	Max. Boost Freq. (GHz) ^a	TDP (W)	L3 Cache (MB)	DDR Channels	Max DDR Freq. (1DPC) ^c	Per-Socket Theoretical Memory Bandwidth (GB/s)	PCIe [®] Gen 4 Lanes ^c	2P/1P
7H12	64	128	2.6	3.3	280 ^{c,d}	256	8	3200	204.8	128	2P/1P
7742	64	128	2.25	3.40	225 ^c	256	8	3200	204.8	128	2P/1P
7702	64	128	2.00	3.35	200	256	8	3200	204.8	128	2P/1P
7702P											1P only
7662	64	128	2.00	3.30	225 ^c	256	8	3200	204.8	128	2P/1P
7642	48	96	2.30	3.30	225 ^c	256	8	3200	204.8	128	2P/1P
7552	48	96	2.20	3.30	200	192	8	3200	204.8	128	2P/1P
7542	32	64	2.90	3.40	225 ^c	128	8	3200	204.8	128	2P/1P
7532	32	64	2.40	3.30	200	256	8	3200	204.8	128	1P/1P
7502	32	64	2.50	3.35	180	128	8	3200	204.8	128	2P/1P
7502P											1P only
7452	32	64	2.35	3.35	155	128	8	3200	204.8	128	2P/1P
7F72	24	48	3.2	3.7	240 ^c	192	8	3200	204.8	128	2P/1P
7402	24	48	2.80	3.35	180	128	8	3200	204.8	128	2P/1P
7402P											1P only
7352	24	48	2.30	3.20	155	128	8	3200	204.8	128	2P/1P
7F52	16	32	3.5	3.9	240 ^c	256	8	3200	204.8	128	2P/1P
7302	16	32	3.00	3.30	155	128	8	3200	204.8	128	2P/1P
7302P											1P only
7282	16	32	2.80	3.20	120	64	8	3200	85.3 ^b	128	2P/1P
7272	12	24	2.90	3.20	120	64	8	3200	85.3 ^b	128	2P/1P
7F32	8	16	3.70	3.90	180	128	8	3200	204.8	128	2P/1P
7262	8	16	3.20	3.40	155	128	8	3200	204.8	128	2P/1P
7252	8	16	3.10	3.20	120	64	8	3200	85.3 ^b	128	2P/1P
7232P	8	16	3.10	3.20	120	32	8	3200	85.3 ^b	128	1P only

- 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
- Performance optimized for 4 channels with DDR4-2667 DIMMS
- 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 1st Gen AMD EPYC Processors. A motherboard designed for 2nd Gen AMD EPYC Processors is required to enable all available functionality. ROM-06
- AMD EPYC 7H12 processor boost frequencies may be achieved only with a cooling solution that meets group 'Z' requirements. Achievable boost frequencies may vary depending on the effectiveness of the actual cooling solution. ROM-282

FOOTNOTES

- EPYC 7002 series has 8 memory channels, supporting 3200 MHz DIMMs yielding 204.8 GB/s of bandwidth vs. the same class of Intel Scalable Gen 2 processors with only 6 memory channels and supporting 2933 MHz DIMMs yielding 140.8 GB/s of bandwidth. $204.8 / 140.8 = 1.454545 - 1.0 = .45$ or 45% more. AMD EPYC has 45% more bandwidth. Class based on industry-standard pin-based (LGA) X86 processors. ROM-11
- For a complete list of world records see <http://amd.com/worldrecords>. ROM-169
- 1-n, 2-socket 2nd Gen EPYC 7H12 powered server (<http://spec.org/cpu2017/results/res2019q4/cpu2017-20190918-18501.html>) scoring 695 SPECrate 2017_int_base has up to 2.29X the SPECrate 2017 Integer (Base) performance of the highest previous generation score of 304 SPECrate 2017_int_base by a 1-n, 2-socket 1st Gen EPYC 7601 powered server result (<http://www.spec.org/cpu2017/results/res2019q2/cpu2017-20190411-11817.html>) as of 11/13/19. ROM-342
- 2P 2nd Gen EPYC™ 7742 scores 769 SPECrate®2017_int_peak (701 SPECrate®2017_int_base) <http://spec.org/cpu2017/results/res2019q4/cpu2017-20191125-20001.html> compared to 2P Xeon® 8280L score of 381 SPECrate®2017_int_peak. (364 SPECrate2017_int_base) <http://www.spec.org/cpu2017/results/res2019q2/cpu2017-20190429-12779.html> as of 12/12/19. ROM-345
- Based on standard calculation method for determining FLOPS. ROM-04
- Based on June 8, 2018 AMD internal testing of same-architecture product ported from 14 to 7 nm technology with similar implementation flow/methodology, using performance from SGEMM. EPYC-07