AMD EPYC™ 7763 PROCESSORS DELIVER GAMING PERFORMANCE ON IBM CLOUD™ SERVERS
CLOUD-BASED GAMING
3rd Gen AMD EPYC™ processors deliver excellent performance for online gaming on bare-metal IBM Cloud servers.

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AMD EPYC™ PROCESSORS

Designed 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 up to 128 lanes of PCIe® Gen 4 and 8 memory channels with access to up to 4TB of high-speed memory. The balanced set of resources found in EPYC processors means more freedom to match the right size of server configuration to each workload.

EPYC GEN	MODEL	CORES	BASE FREQ. (GHZ)	BOOST FREQ. (GHZ)[4]	L3 CACHE (MB)
2nd	7F72	24	3.2 GHz	~3.7 GHz	192
2nd	7642	48	2.3 GHz	~3.3 GHz	256
3rd	7763	64	2.45 GHz	~3.5 GHz	256

Table 1: AMD EPYC™ 2nd and 3rd generation processors available on IBM Cloud

AMD has released three generations of EPYC processors (7xx1, 7xx2, and 7xx3). Both the 2nd Gen 7Fx2 and 3rd Gen 7xF3 AMD EPYC processors bring high per-core performance optimized for frequency-sensitive and single-threaded workloads. The rich portfolio of EPYC high-core-density products can vastly boost application runtime performance in the modern datacenter.

STANDARDS BASED
AMD is committed to industry standards. x86 compatibility means you can run x86 based applications on any AMD EPYC processor generation.

"ZEN 3" CORE & SECURITY FEATURES
Support for up to:
- 64 physical cores, 128 threads
- 256MB of L3 cache per CPU
- 32 MB of L3 cache per core
- 4 TB of DDR4-3200 memory
- 128-160 PCIe® Gen 4 lanes

Infinity Guard security features[1]
- Secure Boot
- Encrypted memory with SEV

FLEXIBLE CLOUD SOLUTIONS
IBM Cloud brings you the flexibility to choose CPUs, storage, networking, security and more. High-core-count AMD EPYC CPUs expand choice and flexibility to customized bare metal IBM Cloud servers.

SEAMLESS WORKLOAD MIGRATION
Migrate applications currently running on other existing cloud instances to AMD EPYC processor-based IBM Cloud instances with little to no modification.

COST-EFFECTIVE COMPUTING FOR CLOUD-BASED APPLICATIONS

Companies of all sizes are increasingly taking advantage of the benefits offered by public cloud providers for many reasons, such as but not limited to: flexible pricing structures, ease of setup, optimization of both staffing and capital budgets, economies of scale, agility, and the ability to instantly go from local to global.

IBM Cloud™ now features 3rd Gen AMD EPYC high-frequency processor-based servers to power bare metal cloud instances of various types and sizes. The AMD EPYC processor-based instances are compatible with existing x86-based applications. They provide additional options for customers to match compute resources to application needs at optimal cost.

GAMING PERFORMANCE ON IBM CLOUD

IBM Cloud offers game hosting on dedicated servers powered by 3rd Gen AMD EPYC processors and has a high-speed IBM Cloud Network backbone.[2] Users are free to customize hardware requirements according to their needs. Dedicated hardware allows your gaming platform to stay well balanced while connecting a large number of players with virtually non-existent lag. You have extensive control over your gaming environment setup. For example, you can tailor rules, install modifications, isolate players and teams, get high-ping, and more. Control nearly every moment with full administration and root access, plus remote options. Manage your need to quickly scale for unexpected player demands. IBM Cloud allows you to scale up or out in real time by adding more memory, processing power, gaming servers, software applications, and more.

PHORONIX TEST SUITE BENCHMARK

The Phoronix Test Suite[3] is a comprehensive testing and benchmarking platform that provides an extensible framework for which new tests can be easily added. The software is designed to effectively carry out both qualitative and quantitative benchmarks in a clean, reproducible, and easy-to-use manner. You can use the Phoronix Test Suite to simply compare your computer's performance with your friends and colleagues or within your organization for internal quality assurance purposes, hardware validation, and continuous integration / performance management.

AMD engineers ran the Phoronix Test Suite's benchmarks (version 10.4 Stable) to get a holistic view on the server's performance for game hosting on an IBM Cloud AMD EPYC 7763 processor-powered bare metal server and then compared that performance against an IBM Cloud AMD EPYC 7642 processor-powered bare metal server, as shown in Table 2.

ITEM	AMD EPYC 7763-BASED SERVER CONFIGURATION	AMD EPYC 7642-BASED SERVER CONFIGURATION
OS	Ubuntu® 20.04	Ubuntu® 20.04
vCPU cores	256	192
Memory	1 TB	1 TB
Nodes Per Socket (NPS)	1	1
Simultaneous Multi-Threading (SMT)	On	On

Table 2: IBM Cloud Server configurations

The selected gaming benchmarks cover aspects that affect gaming performance, such as encoding, compilation, disk I/O, cryptography, compute, memory, JAVA®, eSpeak, and POV-Ray. Figure 1 compares the relative performance of the AMD EPYC processors listed in Table 2, with all results normalized to the AMD EPYC 7642 processor. In all cases, a value of 1.0 signifies the 2nd Gen AMD EPYC 7642 performance. The results above each bar thus denote the 3rd Gen AMD EPYC 7763 performance relative to the 2nd Gen AMD EPYC 7642 performance. These normalized performance results indicate a very consistent and high level of performance across the board, which makes IBM Cloud's AMD EPYC 7763 bare metal server a very good choice for gaming.
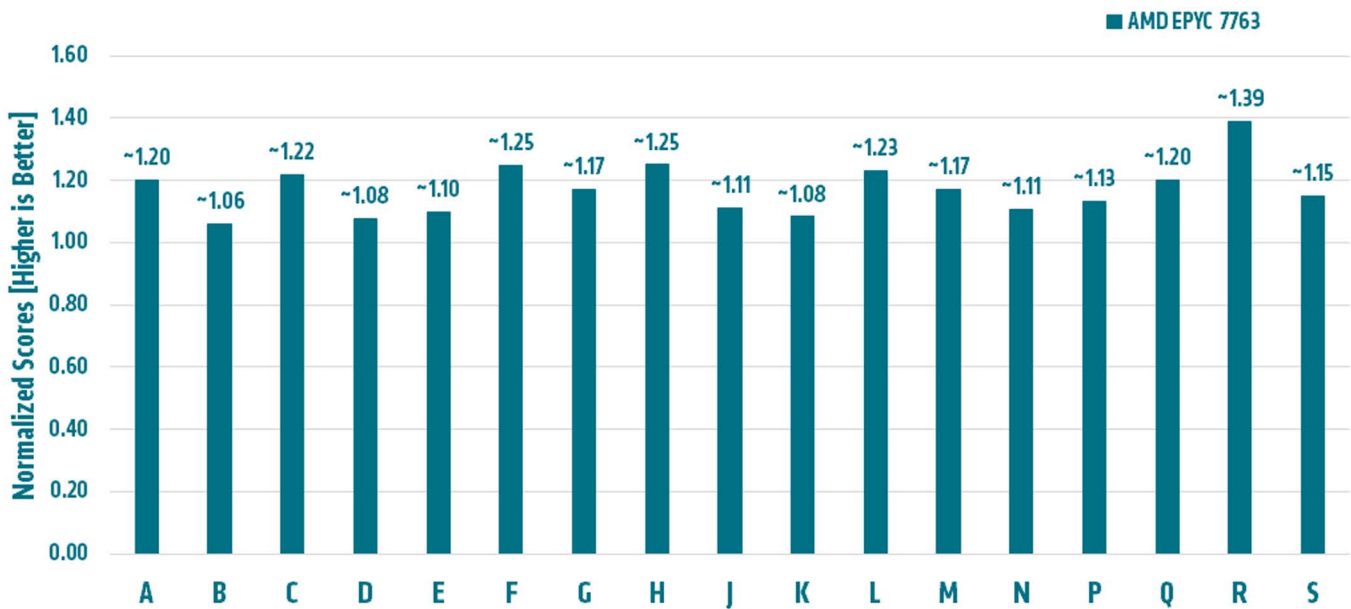
Figure 1: Phoronix Test Suite performance results

The bars in Figure 1 correspond to the following benchmarks:

- **A:** pts/iozone-1.9.5 [Record Size: 1MB - File Size: 4GB - Disk Test: Read Performance]
- **B:** pts/mafft-1.5.0
- **C:** pts/bork-1.0.1
- **D:** pts/cachebench-1.1.2 [Test: Write]
- **E:** pts/cachebench-1.1.2 [Test: Read / Modify / Write]
- **F:** pts/build-imagemagick-1.7.2
- **G:** pts/build-php-1.5.1
- **H:** pts/povray-1.2.1
- **J:** pts/dcraw-1.1.0
- **K:** pts/encode-flac-1.6.0
- **L:** pt s/encode-mp3-1.7.4
- **M:** pts/espeak-1.4.0
- **N:** pts/minion-1.5.2 [Benchmark: Graceful]
- **P:** pts/minion-1.5.2 [Benchmark: Solitaire]
- **Q:** pts/minion-1.5.2 [Benchmark: Quasigroup]
- **R:** pts/sudokut-1.0.1
- **S :** pts/sunflow-1.1.2

CONCLUSION

IBM Cloud Bare Metal Servers powered by 3rd Gen AMD EPYC Series Processors can deliver great performance while bringing you true flexibility of choice for cost-efficient cloud deployments that are ideal for dynamic gaming needs while giving users global player coverage.

REFERENCES

1. AMD Infinity Guard features vary by EPYC™ Processor generations. Infinity Guard security features must be enabled by server OEMs and/or Cloud Service Providers to operate. Check with your OEM or provider to confirm support of these features. Learn more about Infinity Guard at https://www.amd.com/en/technologies/infinity-guard. GD-183

2. Game Hosting on IBM - https://www.ibm.com/cloud/bare-metal-servers/game-hosting*. To learn more about AMD on IBM Cloud, please visit: https://www.ibm.com/cloud/amd*.

3. Phoronix Test Suite - https://www.phoronix-test-suite.com/*

4. 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

RELATED LINKS

- Game Hosting on IBM*
- Phoronix Test Suite*
- AMD on IBM Cloud Bare Metal Servers*
- AMD EPYC™ Processors
- AMD EPYC Technical Briefs and Tuning Guides

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