

Cisco UCS Servers Claim 7 New World Records on Industry Benchmarks

With 2nd Generation Intel Xeon Scalable processors



7 new world records

- Top Java middleware performance
- Fastest integer and floating point performance
- Record-setting big data analytics results



Significant performance improvement

- Upgrade to servers with 2nd Gen Intel® Xeon® Scalable processors and gain up to 23.4 percent more performance than our prior-generation servers²



Faster business-critical workloads

- Industry-standard benchmarks demonstrate the kind of performance you can achieve when you choose Cisco UCS® servers

A decade of industry innovation and the latest Intel Xeon Scalable processors bring seven more reasons to upgrade your data center.

In the 10 years since we first introduced the industry to the concept of unified computing, no other vendor has created a self-aware, self-integrating system that brings 100 percent programmable blade, rack, hyperconverged, multinode, storage, and AI/ML servers into a single management domain. No other vendor has remained storage agnostic so that you can choose industry leaders when you purchase converged infrastructure solutions that bring together compute, network, and storage resources into a single ready-to-deploy unit.

Our decade of data center server innovation has been propelled in part by our alliance with Intel. Today we celebrate seven new world-record benchmark results that demonstrate our continued leadership in online analytic processing, Java enterprise middleware, and raw CPU performance. These results demonstrate the power of our 2- and 4-socket rack servers (Figure 1).



Figure 1 Two Cisco UCS rack servers set new world performance records

Cisco UCS® with 2nd Generation Intel® Xeon® Scalable processors



Real-world performance

Our seven world records reflect real-world performance that can propel your data center to new levels of efficiency. We demonstrate the gains that you can achieve with 2nd Generation Intel® Xeon® Scalable processors with results that span the needs of today's data centers. These needs include high performance to power enterprise applications including online analytics processing (OLAP), Java enterprise middleware, and raw CPU power reflected by integer and floating point benchmarks.

Online analytic processing

Nearly every business understands the value of its data and how it must use data to establish and maintain competitiveness. Online analytic processing derives insight from data through complex queries exemplified by the TPC-H benchmark. Our Cisco UCS C480 M5 server with Intel Xeon Platinum 8280 processors

captures two world records at the 10-TB scale factor running on Linux: the best throughput and the best price/performance. These results represent an 11.6 percent throughput improvement and a 25.2 percent price/performance improvement compared to last-generation servers running Microsoft SQL Server—all helping you maintain a competitive edge ([see note 4](#) and [Table 1](#)).

The TPC-H benchmark is an industry-standard decision-support system benchmark. It is designed to measure the capability of a system to examine large volumes of data, process queries with a high degree of complexity, and return answers to critical business questions. The TPC-H benchmark evaluates a composite performance metric (QphH@size) and a price-to-performance metric (\$/QphH@size) that measure the performance of various decision-support systems by running sets of queries against a standard database under controlled conditions.

Java enterprise middleware

We are proud to announce three new world-record results for the SPECjbb®2015 benchmark on 2- and 4-socket servers running Microsoft Windows 2019 DataCenter ([Table 2](#)).

The SPECjbb2015 benchmark provides physical and virtual performance measurements to give you a more accurate assessment of the way that Java enterprise middleware will perform in your IT environment.

Raw CPU power

Our high marks on benchmarks that test raw computing power isn't a matter of luck. It's good engineering. Cisco UCS servers can be configured programmatically, making it easy to adjust firmware settings for best performance. It's also a matter of outstanding physical design that helps keep the CPUs cool so that Intel Turbo Boost technology can go beyond the thermal limitations of other designs as it increases clock speeds when conditions permit.

Table 1 Our world-record-setting results for the TPC-H benchmark demonstrates that you can easily translate data into business insights

Benchmark	Benchmark Server	Result	Achievement
TPC-H™ 10 TB Result	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8280M processors (28 cores at 2.7 GHz)	1,651,514.9 QphH™@10000GB	Top 4-socket nonclustered QphH@10000GB result running on Linux
		\$0.71 USD per QphH™@10000GB	Best 4-socket nonclustered price per QphH@10000GB result running on Linux

Integer and floating point performance

Our servers demonstrate a performance improvement of 23.4 percent for multithreaded floating point operations ([see note 2](#)) and 14.3 percent for multithreaded integer operations ([see note 3](#)) as measured by the SPEC CPU® benchmarks ([Table 3](#)).

These test raw computing power in the form of single- and multithreaded integer and

floating-point performance measures. This is a measure of how well we deliver the power of the 2nd Gen Intel Xeon Scalable processors to drive application performance. Single-threaded performance gives you a sense of latency for applications that are getting one task accomplished. Think responsiveness of a singlethreaded desktop application supported in a virtual desktop environment. Or business applications hosted in your data center. Multithreaded performance

is a measure of how well the server can accomplish multiple operations in parallel. Think high-performance computing, big data, machine learning, and analytics.

Cisco UCS C240 M5 Rack Server

The particular Cisco UCS M5 server delivering the 1- and 2-socket world-record-setting results is the Cisco UCS C240 M5 Rack Server.

Table 2 Three new world records for Java enterprise middleware performance demonstrates our continued performance leadership

Benchmark	Benchmark Server	Result	Achievement
SPECjbb®2015 MultiJVM	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8280 processors (28 cores at 2.7 GHz)	max-jOPS=171,642 critical-jOPS=56,027	Best 2-socket result for max-jOPS on Microsoft Windows
SPECjbb®2015 MultiJVM	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8280 processors (28 cores at 2.7 GHz)	max-jOPS=327,501 critical-jOPS=100,059	Best 4-socket result for max-jOPS on Microsoft Windows
SPECjbb®2015 MultiJVM	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8280 processors (28 cores at 2.7 GHz)	max-jOPS=282,719 critical-jOPS=175,585	Best 4-socket result for critical-jOPS on Microsoft Windows

Table 3 Cisco sets five new world records on CPU performance benchmarks with servers using 2nd Gen Intel Xeon Scalable processors

Benchmark	Benchmark Server	Result	Achievement
SPEC CPU 2017	Cisco UCS C480 M5 with 4 Intel Xeon Platinum 8280 processors (28 cores at 2.7 GHz)	SPECspeed®2017_fp_base=232	Best 4-socket result
SPEC CPU 2017	Cisco UCS C480 M5 with 4 Intel Xeon Platinum 6244 processors (8 cores at 3.7 GHz)	SPECspeed2017_int_base=11.1	Best 4-socket result

Cisco UCS M5 servers

Cisco UCS M5 servers are equipped with 2nd Gen Intel Xeon Scalable processors:

- **The Cisco UCS C220 M5 Rack Server** is the most versatile general-purpose infrastructure and application server in the industry.
- **The Cisco UCS C240 M5 Rack Server** offers industry-leading performance as demonstrated in this document, and can support a wide range of storage, solid-state disk (SSD), and NVMe options.
- **The Cisco UCS C480 M5 Rack Server** is our newest 4-socket server. Designed for memory-intensive, mission-critical applications, it is our most flexible and customizable server.
- **The Cisco UCS B200 M5 Blade Server** delivers high-density computing in a blade server form factor with flexible configuration options.
- **The Cisco UCS B480 M5 Blade Server** delivers performance, versatility, and density for a wide range of memory-intensive enterprise applications and bare-metal, virtual desktop, and virtualized workloads.

This enterprise-class, 2-socket, 2-rack-unit (2RU) server offers industry-leading performance and expandability for a wide range of storage- and I/O-intensive infrastructure workloads, from big data analytics to collaboration. The storage-intensive C240 and the Cisco UCS C220 Rack Server are foundations for Cisco HyperFlex nodes.

The C240 M5 configurations tested in these benchmarks were configured with two Intel Xeon Platinum 8280 processors with 28 cores at 2.7 GHz, or the Intel Xeon Platinum 6244 processor with 8 cores at 3.7 GHz. Memory and disk configurations are specified in the linked benchmark disclosures.

Cisco UCS C480 M5 Server

The Cisco UCS M5 server delivering the 4-socket world-record-setting results is the Cisco UCS C480 M5 Rack Server. This is an enterprise-class, 4-socket, 4RU server that offers exceptionally high performance and reliability to support your most computing and memory-intensive, mission-critical applications. With up to 6 TB of main memory, up to 24 small-form-factor (SFF) disk drives, or up to 12 NVMe drives, the server can store and process large amounts of local data.

The Cisco UCS C480 M5 configuration tested in these benchmarks was configured with four Intel Xeon Platinum 8280 processors with 28 cores at 2.7 GHz, with memory and disk configurations as specified in the linked benchmark disclosures.

Deploy standalone or as part of Cisco UCS

All of our rack servers can be deployed as part of Cisco UCS or as standalone servers.

As part of Cisco UCS, they can be managed through Cisco UCS Manager or higher-level tools, or they can be managed through Cisco Intersight™ software-as-a-service management in the cloud or in a locally hosted Cisco Intersight Virtual Appliance. The Intersight platform allows you to manage any server anywhere through a cloud-based interface, simplifying management from your core data center to your edge locations. By combining intelligence with automated actions, you can reduce costs dramatically and accelerate time-to-resolution.

Powerful 2nd Gen Intel Xeon Scalable processors

Our continued performance leadership is in part due to the power of the Intel Xeon Platinum 8280 CPUs in our servers. These processors deliver highly robust capabilities with outstanding performance, security, and agility. They offer up to 28 cores in 2- and 4-socket configurations for the best performance and scalability. New in this generation is the capability to support Intel Optane™ persistent memory modules, and Intel® Deep Learning Boost, instructions to accelerate neural network processing found in artificial intelligence and machine learning applications. The processors also offer hardware-assisted sidechannel

For more information

For more information about Cisco UCS performance, visit <http://cisco.com/go/ucsatwork>.

security mitigations that work in conjunction with Cisco UCS servers to further enhance the value of IT infrastructure in your enterprise.

Conclusion

Cisco continues to demonstrate industry leadership with seven world-record-setting benchmark results using 2nd Gen Intel Xeon Scalable processors. When you purchase infrastructure from Cisco, you don't just buy servers: you buy a system that has been built from the beginning to be configured through software—whether you are deploying standalone servers in bulk with the Cisco Intersight platform, servers as part of the Cisco Unified Computing System. As with all Cisco's products, we prepare you for the future while protecting your existing investment.

Disclosures

The following notes compare the last top results with similar prior generation Intel Xeon Scalable CPUs.

1. The Java application performance improvement of 7.40 percent compared the SPECjbb2015-MultiJVM max-jOPS score for the Cisco UCS C480 M5 Rack Server running Microsoft Windows 2019 DataCenter with a [previous-generation Hewlett Packard Enterprise ProLiant DL380Gen 10 server](#) running Microsoft Windows Server 2016 Standard, a result of 159,805 that was published on September 13, 2018.

2. The single-threaded floating-point performance improvement of 23.4 percent compared a Cisco UCS C480 M5 Rack Server with a [previous-generation Cisco UCS C480 M5 Rack Server](#), a result of 188 that was published in October, 2017.
3. The single-threaded integer performance improvement of 14.3 percent compared a Cisco UCS C480 M5 Rack Server with a [previous-generation Cisco UCS C480 M5 Rack Server](#), a result of 9.71 that was published in December, 2018.
4. The TPC-H result throughput improvement of 11.6 percent and price/performance improvement of 25.2 percent is based comparing a Cisco UCS C480 M5 Rack Server with a [previous-generation HPE ProLiant DL580 Gen10 server](#). The Cisco UCS C480 M5 was equipped with 4 Intel Xeon Platinum 8280M processors at 2.7 GHz. The processors have Layer 1 cache including 32 KB instruction plus 32 KB data, 1 MB of Layer 2 cache, and 38.5 MB of Layer 3 cache. The server was configured with 6144 GB of main memory. The server ran Red Hat Enterprise Linux 7.6 accessing Microsoft SQL Server Enterprise Edition build 14.0.3048.4. The resulting record-setting performance at the 10-TB scale factor was 1,651,514.9 QphH™@10000GB and \$0.71 USD per QphH™@10000GB This established top 4-socket nonclustered results running on Linux for both throughput and price/performance.

The Transaction Processing Performance Council (TPC) is a nonprofit corporation founded to define transaction processing and database benchmarks, and to disseminate objective and verifiable performance data to the industry. TPC membership includes major hardware and software companies.