

# Cisco UCS M5 Servers Claim 9 New World Records on Industry Benchmarks

With Intel Xeon Scalable processors



## 9 new world records

- Fastest floating point performance
- Better Java middleware performance to drive business logic
- Leading SAP Sales and Distribution (SD) benchmark performance
- Record-setting high-performance computing score



## Dramatic performance improvement

- Upgrade to Cisco UCS M5 servers and gain up to 86 percent more performance than our prior-generation servers



## Faster business-critical workloads

- Industry-standard benchmarks demonstrating the kind of performance you can achieve when you choose Cisco UCS M5 servers

## Sustained industry-leading performance: a key reason to upgrade to Cisco UCS<sup>®</sup> M5 servers powered by Intel<sup>®</sup> Xeon<sup>®</sup> Platinum processors.

With eight years of leadership in the server market, we are still the only vendor selling not just servers, but systems. Cisco Unified Computing System™ (Cisco UCS), Cisco HyperFlex™ systems, Cisco® converged infrastructure solutions: these are still the industry's only self-aware, self-integrating systems that can support Cisco UCS blade, rack, dense storage, and hyperconverged servers in a single management domain.

Demonstrating our continued capability to lead the server market in raw CPU power, Java enterprise middleware, core business applications, and high-performance computing workloads, we introduce the Cisco UCS M5 server family, which delivers up to 86 percent better performance than prior-generation servers (Figure 1).

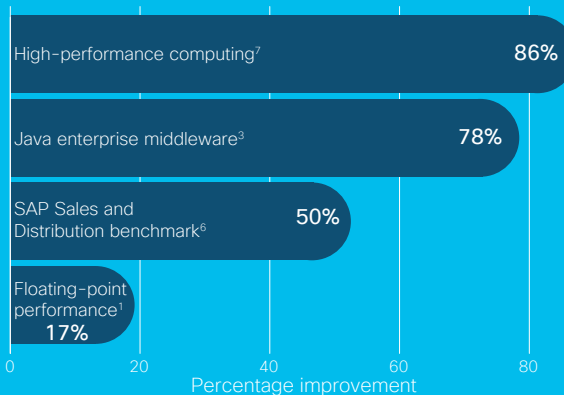


Figure 1 Cisco UCS M5 Servers deliver up to 86 percent better performance

Cisco UCS with Intel Xeon  
Platinum processors



## Performance that matters

Our nine world records span the range of real-world applications represented by benchmarks that test raw computing power, Java enterprise middleware, SAP Sales and Distribution (SD), and high-performance computing (HPC) performance (Table 1).

### Raw CPU power

The SPECint® and SPECfp® benchmarks 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 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 datacenter. 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.

High marks on these benchmarks 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

Table 1 Cisco sets five new world records with servers using Intel Xeon Scalable processors

Benchmark	Server	Score and disclosure link	Percentage improvement over previous generation
SPECfp®2006	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">SPECfp_base2006=150</a> Best 4-socket result	17% <sup>1</sup>
SPECjbb®2015 MultiJVM	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">max-jOPS=351,175</a> critical-jOPS=112,800 Best 4-socket result for max-jOPS	61% <sup>2</sup>
SPECjbb®2015 MultiJVM	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	max-jOPS=272,500 <a href="#">critical-jOPS=229,029</a> Best 4-socket result for critical-jOPS	78% <sup>3</sup>
SPECjbb®2015 Composite	Cisco UCS C480 M5 Rack Server with 4 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">Composite max-jOPS=262,190</a> Composite critical-jOPS=97,569 Best 4-socket result for Composite max-jOPS	New Cisco benchmark result
SPECjbb®2015 MultiJVM	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">max-jOPS=179,534</a> critical-jOPS=58,094 Best 2-socket result for max-jOPS	52% <sup>4</sup>
SPECjbb®2015 MultiJVM	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	max-jOPS=141,360 <a href="#">critical-jOPS=118,551</a> Best 2-socket result for critical-jOPS	65% <sup>5</sup>
SPECjbb®2015 Composite	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">Composite max-jOPS=155,296</a> Composite critical-jOPS=75,071 Best 2-socket result for Composite max-jOPS	New Cisco benchmark result
SAP Sales and Distribution (SD) Benchmark	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">Users=31,885, SAPS score=174,395</a> Best 2-processor, 2-tier result on Microsoft Windows	50% <sup>6</sup>
SPEC OMPG 2012	Cisco UCS C240 M5 Rack Server with 2 Intel Xeon Platinum 8180 processors (28 cores at 2.5 GHz)	<a href="#">SPECComp®G_base2012=23.1</a> Best 2-socket result	86% <sup>7</sup>

## Cisco UCS M5 servers

Designed to provide your computing infrastructure now and into the future, Cisco UCS M5 servers give you the benefits of the latest Intel Xeon Platinum processors:

- **More cores** to accelerate parallelized virtualized and bare-metal workloads
- **Larger memory capacity** for better performance and larger in-memory databases
- **Higher memory bandwidth** to accelerate the flow of information to and from the CPU
- **Ready for Intel 3D XPoint** nonvolatile memory
- **Up to 6 PCIe GPU accelerators** for a smooth user experience in virtual desktop environments
- **Cloud management ready**

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.

### Java enterprise middleware

The SPECjbb®2015 benchmark aligns with the changes that you are experiencing in your IT organization. For example, it 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.

As Table 1 illustrates, Cisco UCS servers with Intel Xeon Scalable CPUs deliver from 52 to 78 percent better SPECjbb2015 performance than the best results with previous-generation Cisco UCS servers.

### SAP Sales and Distribution

The SAP SD benchmark stresses computing infrastructure and determines whether a consistent response can be delivered as more users consume system resources. Focused on testing components that influence the sizing of deployments, the benchmark exercises the processes that handle a sell-from-stock transaction, including business processes such as order creation and delivery, the movement of goods, and invoice creation. As a result, real-world infrastructure experiences conditions similar to the conditions found in two-tier SAP applications.

The new Cisco UCS C240 M5 Rack Server delivered 50 percent better performance than the Cisco UCS C240 M4 Rack Server equipped

with Intel Xeon processor E5 v4 family CPUs. Even more remarkable, using Microsoft Windows Server 2012 R2, the result exceeds even the [best 4-socket result](#) with the Intel Xeon processor E7 v4 family, suggesting the value of upgrading to the latest Cisco UCS M5 servers.

### High-performance computing

The SPECComp®G 2012 benchmark measures the performance of high-intensity shared-memory parallel processing applications. It includes 14 samples from science and engineering environments, including computational fluid dynamics, molecular modeling, and image manipulation. You can use the results for the SPECComp 2012 benchmark to evaluate your own likely performance gains if you run highly parallelized, CPU-intensive applications. Our measurements of SPECComp 2012 performance show an astonishing 86 percent increase compared to the prior-generation Intel Xeon processors designed for 2-socket servers.

## Cisco UCS C240 M5 Rack Server

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

## Cisco UCS M5 blade servers

Cisco UCS M5 blade servers are equipped with Intel Xeon Scalable processors:

- 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.

The C240 M5 configurations tested in these benchmarks were configured with two Intel Xeon Platinum 8180 CPUs with 28 cores at 2.5 GHz, with 384 GB or 1536 GB of memory, and with disk configurations as specified in the 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, four-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 8180 processors with 28 cores at 2.5 GHz, 768 GB of memory, and with disk configurations as specified in the benchmark disclosures.

### Deploy standalone or as part of Cisco UCS

All of our rack servers can be deployed as standalone servers or as part of Cisco UCS. With a flexible set of deployment models and a comprehensive set of management solutions, these innovative servers can help reduce your total cost

of ownership (TCO) and increase your business agility regardless of whether you deploy Cisco UCS technology in your core data center or at the network edge.

Cisco UCS M5 servers are supported by the full suite of Cisco UCS management tools, and they are engineered to be “Starship ready.” Starship is a new Cisco cloud-based management platform that uses analytics to deliver proactive automation and support. By combining intelligence with automated actions, you can reduce costs dramatically and accelerate time-to-resolution.

## Powerful Intel Xeon Platinum processors

Our continued performance leadership is in part due to the power of the Intel Xeon Platinum 8180 CPUs in our servers. Built on 14-nanometer (nm) processor technology, Intel Xeon Platinum 8180 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. The CPUs provide top-of-the-line memory channel performance and include three Intel UltraPath Interconnect (UPI) links across the sockets for improved scalability and intercore data flow. Internal Intel benchmarks have demonstrated up to 3.9-times greater virtualized throughput and support for more virtual machines per server than with the Intel Xeon processor

## Cisco UCS M5 rack servers

Cisco UCS M5 rack servers are equipped with 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

E5-2690 v4 CPU using a virtualization infrastructure consolidation workload (for complete information, visit <http://www.intel.com/benchmarks>). The processors also offer hardware-assisted security advancements without compromising performance and 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 nine world-record-setting benchmark results using the new 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 Integrated Management Controller (IMC) Supervisor, servers as part of the Cisco Unified Computing System, or servers on your network edge configured through future cloud management options. As with all Cisco's products, we prepare you for the future while protecting your existing investment.

## Disclosures

1. The single-threaded floating-point performance improvement of 17 percent compared the SPECfp\_base2006 score of 128 for a Cisco UCS C480 M5 server with a [previous-generation Cisco UCS C460 M4 server](#), a result of 128 that was achieved in May, 2016
  2. The Java application performance improvement of 61 percent compared the SPECjbb2015-MultiJVM max-jOPS score for the Cisco UCS 480 M5 Rack Server with a [previous-generation Cisco UCS C460 M4 Rack Server](#), a result of 218,425 that was published on June 6, 2016.
  3. The Java application performance improvement of 78 percent compared the SPECjbb2015-MultiJVM critical-jOPS score for the Cisco UCS 480 M5 Rack Server with a [previous-generation Cisco UCS C460 M4 Rack Server](#), a result of 128,990 that was published on June 6, 2016.
  4. The Java application performance improvement of 52 percent compared the SPECjbb2015-MultiJVM max-jOPS score for the Cisco UCS C240 M5 Rack Server with a [previous-generation Cisco UCS C220 M4 Rack Server](#), a result of 117,931 that was published on April 13, 2016.
  5. The Java application performance improvement of 65 percent compared the SPECjbb2015-MultiJVM critical-jOPS score for the Cisco UCS C240 M5 Rack Server with a [previous-generation Cisco UCS C220 M4 Rack Server](#), a result of 71,951 that was published on April 13, 2016.
  6. The SAP Sales and Distribution performance improvement of 50 percent compared the SAP SD score for the Cisco UCS C240 M5 Rack Server with the [previous-generation Cisco UCS C240 M4 Rack Server](#), a result of 21,210 users that was certified by SAP on March 31, 2016. The Cisco UCS C220 M5 server was equipped with two Intel Xeon Platinum 8180 CPUs each with 28 cores at 2.5 GHz. The processors have 32 KB plus 32 KB of Layer 1 cache, 1 MB of Layer 2 cache, and 38.5 MB of Layer 3 cache. The server is configured with 768 GB of main memory. The benchmark used Microsoft Windows Server 2012 R2 Datacenter Edition, with the IBM DB2 Advanced Enterprise Server Edition database 10.5. The tests used SAP Enhancement Package 5 for SAP Enterprise Resource Planning (ERP) 6.0. Results referenced are available from the SAP website at <http://global.sap.com/solutions/benchmark/sd2tier.epx> and are current as of July 11, 2017.
  7. The parallel-processing performance improvement of 86 percent compared the SPECCompG\_base2012 score for the Cisco UCS C240 M5 Rack Server with the [previous-generation Cisco UCS B200 M4 Blade Server](#), a result of 12.4 that was tested in March 2016.
- SPEC, SPECint, SPECjbb, and SPECComp are registered trademarks of Standard Performance Evaluation Corporation.

## For more information

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