

Cisco UCS C480 M5 Rack Server Delivers Unsurpassed Price-per- Performance on the TPC-H Benchmark



An industry first

- World-record TPC-H 4-socket result at 10 TB¹
- World-record Microsoft SQL Server 2017 4-socket result¹
- First world-record TPC-H 4-socket result at 10 TB on Linux¹



Faster performance

- Cisco UCS C480 M5 Rack Server outperforms HPE ProLiant DL580 Gen 10 by 12% and the Lenovo ThinkSystem SR950 by 24% on the TPC-H benchmark at 10 TB²



Better price-per-performance and efficiency than prior servers

- 25% improvement over the HPE ProLiant DL580 in price-per-performance
- 23% improvement over the Lenovo ThinkSystem SR950 in price-per performance

Cisco UCS® C480 M5 Rack Server delivers the best nonclustered TPC-H benchmark result at the 10-TB scale factor and the first world-record result on Linux.

The ability to make real-time business decisions depends on server performance. Cisco UCS C480 M5 Rack Servers are fast and efficient at processing decision-support queries as measured by the [TPC-H benchmark](#) at the 10-TB scale factor. Our newest result (Figure 1) shows how the system's 2nd Gen Intel® Xeon® Scalable processors, memory, and storage deliver database performance with Microsoft SQL Server 2017 Enterprise Edition running on Red Hat Enterprise Linux.

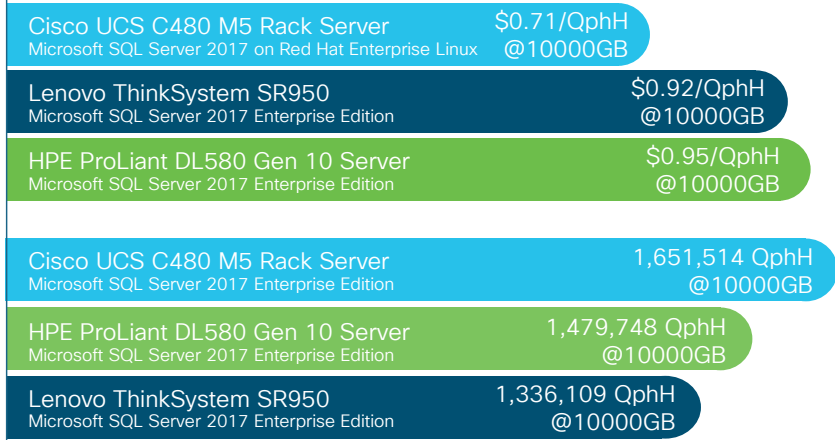


Figure 1 Cisco UCS C480 M5 Rack Server delivers up to 25 percent better price-per-performance than the HPE ProLiant DL580 Gen 10 Server and up to 24 percent better performance than the Lenovo ThinkSystem SR950 Server

Cisco UCS with Intel Xeon
Platinum processors



When you deploy servers in the Cisco Unified Computing System™ (Cisco UCS), you can run Microsoft and non-Microsoft workloads on the same system to further reduce total cost of ownership (TCO).

Performance and efficiency for real-world workloads

An industry-standard decision-support system benchmark, [TPC-H](#) measures 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 benchmark evaluates a composite performance metric (QphH@size) and a price-per-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.

Cisco UCS C480 M5 Rack Servers delivered [1,651,514 QphH@10000GB](#) and [US\\$0.71/QphH@10000GB](#). These results exceed those of HPE ProLiant DL850 Gen10 servers by up to 12 percent in performance with up to 25 percent better price-per-performance, and the Lenovo ThinkSystem SR950 by up to 24 percent in performance and up to 23 percent in price-per-performance (Table 1).

Cisco UCS C480 M5 Rack Server

The Cisco UCS C480 M5 Rack Server is an enterprise-class, 4-socket, 4-rack-unit (4RU) server. It offers industry-leading performance for a wide range of storage and I/O-intensive infrastructure workloads, from in-memory databases, to big data analytics, to collaboration.

The Cisco UCS C480 M5 we tested was configured with four Intel Xeon Platinum 8280M CPUs

with 28 cores at 2.70 GHz and 6 TB of memory, four Nonvolatile Memory Express (NVMe) drives for database persistence, 14 960-GB SATA solid-state disk drives in a RAID configuration for the operating system and database transaction log, and four 960-GB SATA SSD drives for backup. Redundancy was provided for the operating system and database log for recovery as specified by benchmark requirements.

Powerful processors

Our continued performance leadership is due in part to the power of the Intel Xeon Platinum 8280M CPUs in our servers. Built on 14-nanometer processor technology, Intel Xeon Platinum 8280M 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

Table 1 Cisco continues to set world records on the TPC-H benchmark (non-clustered) with servers using Intel Xeon Scalable processors

	Cisco UCS C480 M5 Rack Server	HPE ProLiant DL850 Gen 10 Server	Lenovo ThinkSystem SR950 Server
Processor	4 x Intel Xeon Platinum 8280M processors at 2.7 GHz (4 sockets, 112 cores)	4 x Intel Xeon Platinum 8180M processors at 2.5 GHz (4 sockets, 112 cores)	4 x Intel Xeon Platinum 8180M processors at 2.5 GHz (4 sockets, 112 cores)
Memory	6 TB	6 TB	6 TB
CPU power (TDP)	205W	205W	205W
Rack units	4	4	4
Performance	1,651,514 QphH@10000GB	1,479,748 QphH@10000GB	1,336,1096 QphH@10000GB
Price-per-performance	US\$0.71 /QphH@10000GB	US\$0.95 /QphH@10000GB	US\$0.92 /QphH@10000GB
Software	Microsoft SQL Server 2017 Red Hat Enterprise Linux 7.6	Microsoft SQL Server 2017 Microsoft Windows Server 2016	Microsoft SQL Server 2017 Microsoft Windows Server 2016

Better performance at lower cost

As evidenced by the TPC-H benchmark results, Cisco UCS C480 M5 Rack Servers deliver better performance and up to 25 percent better price-per-performance than competitive servers.

Performance is delivered by:

- **Higher memory bandwidth** to accelerate the flow of information to and from the CPU
- **Higher bus bandwidth** to accelerate the flow of information from the storage to the CPU
- **Higher network bandwidth** to accelerate the flow of information from the network to the CPU

Learn more

- To learn more about Cisco UCS C480 M5 Rack Servers, visit [cisco.com/go/servers](https://www.cisco.com/go/servers).
- To learn more about Cisco UCS performance on industry benchmarks, visit [cisco.com/go/ucsatwork](https://www.cisco.com/go/ucsatwork).

memory channel performance and include three Intel UltraPath Interconnect (UPI) links across the sockets for improved scalability and intercore data flow. Hardware-assisted security advancements do not compromise performance and work with Cisco UCS servers to enhance the value of infrastructure.

Flexible deployment

Cisco UCS C480 M5 Rack Servers can be deployed as standalone servers or as part of Cisco UCS, and are supported by the full suite of Cisco UCS management tools. The Cisco Intersight™ software-as-a-service management platform uses analytics to deliver proactive automation and support. By combining intelligence with automated actions, you can reduce costs dramatically and accelerate time to resolution.

Conclusion

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 8280M processors captures two world records at the 10-TB scale factor running on Linux: the best throughput and the best price-per-performance ratio.

Disclosures

1. 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. TPC-H, QphH, and \$/QphH are trademarks of the TPC. The performance results described in this document are derived from detailed benchmark results available as of June 12, 2018, at www.tpc.org/tpch/default.asp.
2. Cisco UCS C480 M5 Rack Server: 1,651,514 QphH@10000GB and \$0.71/QphH@10000GB. HPE ProLiant DL580 Gen 10: 1,479,748 QphH@10000GB and \$0.95/QphH@10000GB. Lenovo ThinkSystem SR950: 1,336,109 QphH@10000GB and \$0.92/QphH@10000GB. Percentages calculated from detailed TPC-H benchmark results available as of April 11, 2019, at http://www.tpc.org/tpch/results/tpch_advanced_sort.asp.