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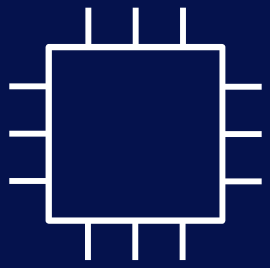

Power Your Microsoft SQL Server Databases

With Cisco UCS rack servers and AMD EPYC processors

Cisco UCS® C225 M6 and C245 M6 rack servers with AMD EPYC™ processors can supercharge Microsoft SQL Server, no matter the database size.

AMD EPYC processors deliver outstanding performance for many workloads. World-record-setting performance on the TPC-H benchmark running Microsoft SQL Server[1] software is proof that AMD is ready to power your database management software.

Cisco UCS C225 M6 and C245 M6 servers based on AMD EPYC processors support up to two CPUs and up to 128 cores, 128 PCIe 4.0 lanes, and synchronized fabric and memory clocks, all designed to drive fast time to results.

Our single-socket-optimized Cisco UCS C225 M6 delivers the same I/O capacity regardless of whether you equip it with one or two CPUs. So you can conserve license costs by using a single CPU with from 8 to 64 cores plus up to 768 MB L3 cache per processor. All these features add up to excellent performance at an affordable price that enables your business to adopt new capabilities, quickly.

Highlights

- AMD EPYC processors are ready to power your database management systems
- Get the most out of your software licenses
- Cisco demonstrates top performance on the TPC-H benchmark running Microsoft SQL Server[1]
- Help protect data from prying eyes with AMD Infinity Guard features[2]

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Right-size software license costs

For most customers, Microsoft SQL Server is licensed on a per-core basis—so you want to maintain a high level of performance using the fewest number of cores. If you can reduce the number of cores, you lower not just the initial license costs but your annual support costs as well. The ability to choose from 8 to 64 cores per AMD EPYC processor helps you balance price, performance, and Microsoft SQL Server licensing costs.

The Cisco UCS C225 M6 Rack Server is just the solution for databases needing only a single processor. This 1-Rack-Unit (1RU) single-socket-optimized server delivers the same I/O capacity regardless of whether you use one or two CPUs. You can use high-frequency AMD EPYC processors for:

- Excellent processing power
- Right-sized software license and support costs
- The same memory capacity, storage capacity, and I/O bandwidth as the rest of the AMD EPYC product line

Top performance

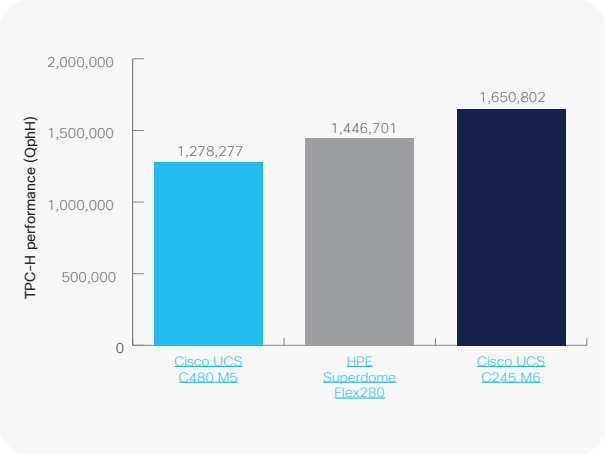
World-record-setting performance, as measured by the Transaction Processing Performance Council Benchmark H (TPC-H)[1] benchmark, suggests that your workloads may run faster on Cisco UCS C225 M6 and C245 M6 rack servers.

Our TPC-H 30-TB benchmark result reflects real-world performance that can help propel your business decision support to new levels of efficiency. As Figure 1 illustrates, we demonstrate a 12-percent gain over HPE that you can achieve by moving to 3rd Gen AMD EPYC processors to target the needs of your business. The world record was set by the Cisco UCS C245 M6 Rack Server using AMD EPYC 7763 processors with 64 cores per CPU. We used 8 TB of main memory to achieve these record-setting 2-socket results.

Performance for departmental servers

Many organizations don't need world-record-setting performance. Instead, they need to get the most out of their per-core licenses by getting the best-per-core performance from lower-core-count processors. For these workloads, high-frequency AMD EPYC processors are available in counts of 8, 12, 16, and 32 cores.

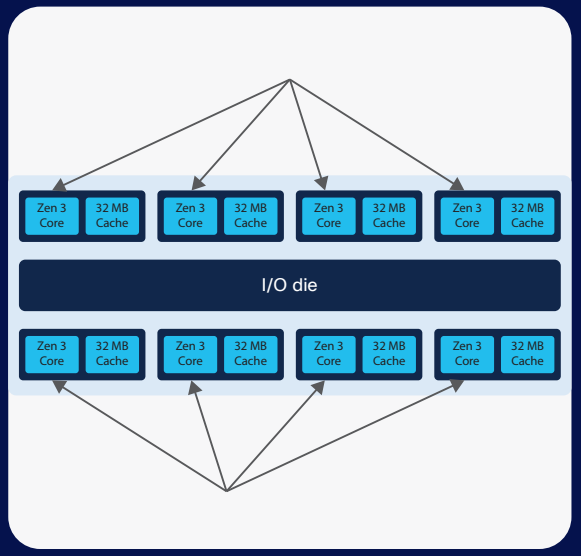
Figure 1. Our 2-socket nonclustered Cisco UCS C245 M6 TPC-H 30-TB result outpaces 4-socket results from HPE and from our prior-generation 4-socket server



High-frequency options

Third Gen AMD EPYC processors are systems on chip that include up to eight CPU dies, each of which has up to eight 'Zen3' cores and a shared Level 3 cache. An I/O die handles I/O and memory interfaces.

AMD offers high-frequency processors that deliver high performance per core made possible by physically distributing the active cores for better heat dissipation. The 8-core AMD EPYC 72F3 processor is illustrated below, where one active CPU core resides on each CPU die. Other high-frequency options are available in 12-, 16-, and 32-core counts.



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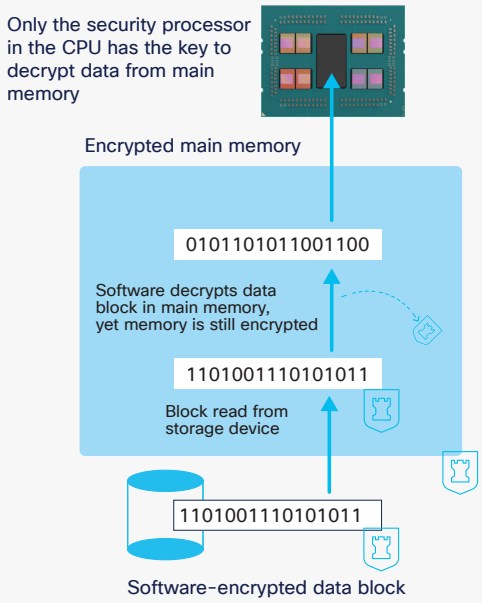
Protect your data from prying eyes

When you combine encrypted storage with AMD Secure Memory Encryption, you help keep your data encrypted from end to end.

1. Data is software encrypted on the NVMe, SSD, or hard disk drive (HDD).
2. When a data block is read into main memory, SME provides additional protection.
3. When the data block is decrypted in software, it is remains encrypted in memory by SME.
4. The data block is in plaintext only when it is in the AMD EPYC processor, the only entity knowing the memory encryption key.



For example, the 8-core AMD EPYC 72F3 processor delivers the world's highest per-core performance on the SPECrate®2017_int_base benchmark,[MLN-057C] suggesting that it would be an excellent choice for Microsoft SQL Server.

Firmware settings that control boost frequencies are set through the Cisco Intersight™ cloud-operations platform so you can dial in your performance to enjoy consistently excellent database performance and simplified management.

Integrated security features

Data security has never been more important. AMD Infinity Guard[2] security features provide a modern multifaceted, hardware-based approach to data center security, with minimal performance impact. These features help servers to be resistant to today's sophisticated attacks, helping protect your sensitive data, avoid downtime, and reduce resource drain.

AMD Secure Memory Encryption (SME) helps protect system memory from view while keeping it transparent to the operating system and applications. It helps protect the integrity of memory from bare metal to the cloud.

If you are running your database in a virtualized environment, EPYC processors deliver AMD Secure Encrypted Virtualization (SEV), giving each virtual machine its own encryption key to help prevent an attack into and between virtual machines. Additionally, SEV-Secure Nested Paging (SEV-SNP) adds strong memory integrity protection capabilities to help prevent malicious hypervisor-based attacks.

Either way, your main memory or virtual machine memory is encrypted with keys that only the dedicated security processor in the CPU knows. Data is encrypted when it is read into memory. When you decrypt disk blocks in memory, they are still hidden from view because main memory is encrypted (see sidebar)

Cisco UCS servers

Cisco UCS combines servers, networking, and management into a single cohesive system. You choose what's best for your SQL database needs: by choosing the server size and local storage capacity, number of sockets, and number of cores per socket. Now you can optimize all your SQL databases—with open APIs for broad interoperability and unparalleled automation. Our AMD EPYC processor-powered servers include:

- 1- or 2-CPU configurations
- Unified management with the Cisco Intersight cloud-operations platform
- Cisco Validated Designs that help you implement pretested and validated configurations for enterprise applications, virtual desktop environments, databases, and more

Cisco UCS C225 M6 Rack Server

Optimized to deliver uncompromising I/O capacity whether one or two CPUs are installed, the Cisco UCS C225 M6 Rack Server is one of the most

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Learn more

Discover how Cisco UCS with AMD EPYC 7003 Series processors can help you access your data faster and provide high performance, low cost solutions with robust security features.

- Microsoft software on Cisco UCS
- Cisco UCS TPC-H results

Seeing is believing

Contact your Cisco sales representative today to find out more about Cisco UCS servers with AMD EPYC processors.

1. The Cisco UCS C225 M6 Rack Server holds the performance record for 2-socket nonclustered TPC-H results, at 30,000 GB with a QphH of 1,650,802. TPC-H and QphH, are trademarks of the Transaction Processing Performance Council (TPC). The performance results described in this document are derived from detailed benchmark results available from tpc.org as of May 23, 2022.
2. AMD Infinity Guard features vary by EPYC processor generation. 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
3. For further details on the superscript links in this document, please visit amd.com/en/claims/epyc. For a list of world-record benchmarks, please visit amd.com/worldrecords.

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versatile solutions in the industry. This high-density, 1RU, 1- or 2-socket rack server supports a range of database workloads. It features:

- Up to two 3rd Gen AMD EPYC processors with up to 64 cores per socket
- 32 DIMM slots for up to 8 TB of memory
- Up to 10 SFF NVMe, SAS, or SATA drives
- Up to 3 PCIe 4.0 slots
- Support for 1400 series Cisco® virtual interface cards and OCP 3.0 network cards
- RAID controller and GPU options
- Internal dual M.2 drive options

Cisco UCS C245 M6 Rack Server

This world-record-setting server used in our TPC-H measurements, the 2RU Cisco UCS C245 M6, is well suited for a wide range of storage- and I/O-intensive applications such as your large SQL database deployments. The server features:

- Up to two 3rd Gen AMD EPYC processors with up to 64 cores per socket
- 32 DIMM slots for up to 8 TB of memory
- Up to 24 front-facing Small-Form-Factor (SFF) SAS or SATA drives, including up to 4 NVMe drives
- 4 optional rear-facing NVMe drives
- Up to 8 PCIe 4.0 slots
- Support for 1400 series Cisco virtual interface cards and OCP 3.0 network cards
- RAID controller and GPU options
- Internal dual M.2 drive options

Power all your SQL databases with Cisco UCS

Cisco UCS C225 M6 and C245 M6 rack servers can power all of your Microsoft SQL Server databases to accelerate time-to-information, a key competitive capability. The combination of Cisco UCS and AMD EPYC processors delivers a high-performance, versatile platform that you can configure to meet your database and cost needs, whether in a remote or branch office, a departmental setting, or your enterprise data center. It's security features enable hardware-based encryption to help dissuade intrusions. Let us help you deliver information faster.