

Cisco UCS C240 M3 Rack Server Delivers World-Record Cloud Computing Performance



Flash-Memory-Accelerated Performance

Performance Brief
May 2013

In collaboration with Fusion-io; Cisco UCS
with intelligent Intel® Xeon® processors



Highlights

World-Record-Setting Results

- The Cisco UCS® C240 M3 Rack Server delivers a VMware® VMmark™ 2.5 score of 12.00@10 tiles, outperforming all other 2-socket servers in a 2-node configuration.

Better Performance for Workloads

- Whether a virtualized data center or a public or private cloud is needed, this VMware VMmark 2.5 benchmark result indicates the degree to which the Cisco Unified Computing System™ (Cisco UCS) can accelerate applications.

Outstanding Server Performance and Expandability

- Powered by the Intel® Xeon® processor E5 family
- Large (up to 768 GB) memory capacity
- Four 1 Gigabit Ethernet LAN-on-motherboard (LOM) ports

Low Latency with Fusion-io Technology

- 7.2 terabytes (TB) of flash memory storage for virtual application acceleration
- Industry-leading capacity and consistent low-latency performance
- Benefits of flash memory and server economics

Flexible Server Deployments

- The Cisco UCS C240 M3 Rack Server can operate in standalone environments or as part of Cisco UCS for greater flexibility and computing density in a small footprint.

The Cisco UCS C240 M3 Rack Server with Fusion-io ION Data Accelerator delivers the best cloud computing performance of any 2-socket server in a 2-node configuration as measured by the VMware VMmark 2.5 benchmark: better performance than solutions from Dell, Fujitsu, and HP.

Since the Cisco Unified Computing System™ (Cisco UCS®) was first introduced four years ago, it has captured more a dozen world-record performance titles on VMware® VMmark™ benchmarks. The Cisco UCS C240 M3 Rack Server's score of 12.00@10 tiles on the VMware VMmark 2.5 benchmark continues this trend, delivering virtualization and infrastructure performance and agility for cloud computing environments. The system used to achieve this performance included the Cisco UCS C240 M3 Rack Server powered by Intel® Xeon® processors and an industry-leading approach to storage: a Cisco UCS server-based Fusion-io ION Data Accelerator solution that turns the server into a storage system.

Technology Innovation

Technology innovation contributes to Cisco's success in providing solutions that deliver high performance and support virtual machine movement, storage migration, and virtual machine provisioning for more agile data center cloud deployments.

- **Flexible server deployment:** Capable of operating in standalone deployments or as part of Cisco UCS, Cisco UCS C-Series Rack Servers extend unified computing innovations to a rack-mount form factor, including unified management through a single wire, a standards-based unified network fabric, and radical simplification through Cisco® fabric extender technology. Based on industry-standard, intelligent Intel Xeon processors, Cisco UCS C-Series Rack Servers can be configured with third-party PCI Express (PCIe) cards as the case in this benchmark.
- **Intelligent switches:** The Cisco Nexus® 5548UP Switch provides a standards-based, multipurpose, multiprotocol, Ethernet-based fabric. Support for 10 Gigabit Ethernet or 8-Gbps Fibre Channel on any port enables the right communication mode to be selected for a given workload through the simple use of a transceiver.
- **Processor advances:** Cisco's results on the VMware VMmark 2.5 benchmark show how effective Intel Hyper-Threading Technology is compared to the AMD Opteron Processor 638 SE, with its increased core count, used in competing

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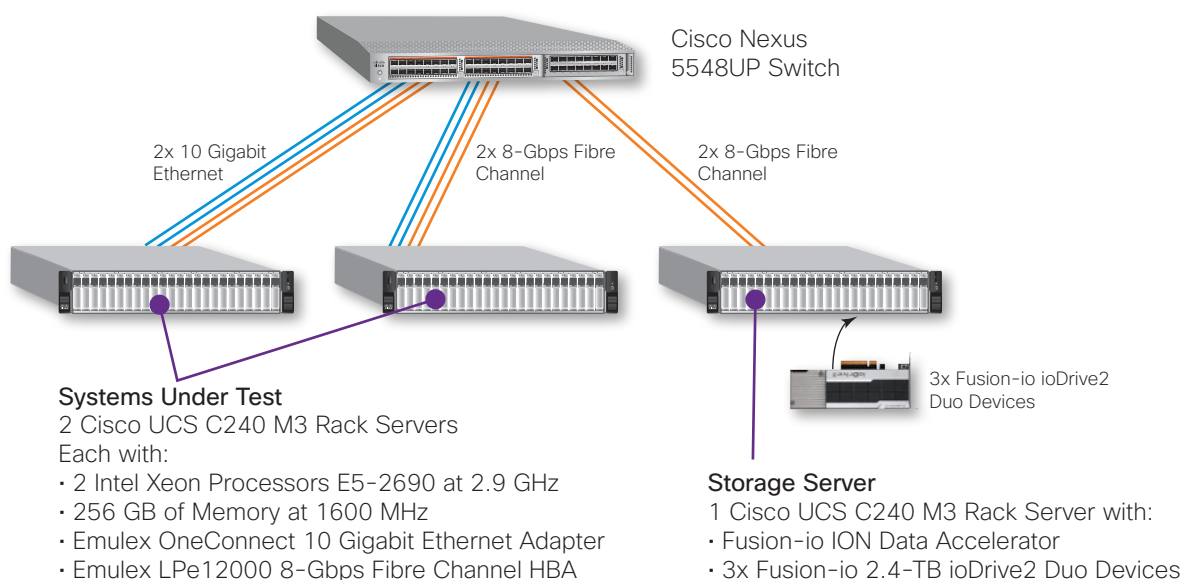


Figure 1. VMware VMmark 2.5 Benchmark Configuration

solutions such as Dell PowerEdge R715 servers.

- **Flash memory:** The Fusion-io ION Data Accelerator transforms Fusion-io ioDrive2 flash memory into a high-performance, low-latency storage target.

VMware VMmark 2.5 Benchmark

The VMware VMmark 2.5 benchmark uses a tiled design that incorporates six real-world workloads to calculate a virtualization score. Then it includes VMware vMotion, Storage vMotion, and virtual machine provisioning times to calculate an infrastructure score. The combination of these scores is the total benchmark score. Because Cisco UCS is a truly unified system, it delivers both virtualization and infrastructure high performance.

Benchmark Configuration

The benchmark used two Cisco UCS C240 M3 Rack Servers, each powered by two 8-core Intel Xeon E5-2690 processors (Figure 1). Intel Turbo Boost Technology was enabled with the capability to raise the clock speed from 2.9 GHz to up to 3.8 GHz as conditions permitted. Each system was configured identically with both an Emulex 10 Gigabit Ethernet and Fibre Channel host bus adapter (HBA).

Expandability in a Rack Form Factor

The Cisco UCS C240 M3 Rack Server is designed for both outstanding performance and expandability over a wide range of storage-intensive infrastructure workloads, from big data to collaboration. This two-rack-unit (2RU) rack-mount server supports up to two Intel Xeon E5-2600 series processors, 24 DIMM slots for up to

768 GB of memory, 24 disk drives, and four 1 Gigabit Ethernet LAN-on-motherboard (LOM) ports to provide exceptional levels of internal memory and storage expandability and outstanding performance.

Intel Xeon Processor E5 Family

The Cisco UCS C240 M3 server is powered by the Intel Xeon processor E5 family. This versatile processor family forms the core of a flexible and efficient data center. Designed to deliver the right combination of performance and built-in capabilities at lower cost, the Intel Xeon processor E5 family delivers adaptive performance to a wide range of applications. In addition, Intel integrated I/O dramatically reduces I/O latency to help eliminate data bottlenecks and increase agility.

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Fusion-io Flash Memory Storage System

Using off-the-shelf components, a third Cisco UCS C240 M3 Rack Server was configured with three Fusion ioDrive2 Duo devices and the Fusion-io ION Data Accelerator to transform the Cisco UCS C240 M3 into a high-performance Fibre Channel storage server. Each Fusion ioDrive2 Duo device provides 2.4 terabytes (TB) of capacity for each x8 PCIe slot. This capability allows organizations to scale to meet workload demands, handle larger spikes in traffic, and consolidate more infrastructure.

The Fusion-io ION Data Accelerator turns Cisco UCS servers equipped with Fusion-io ioMemory into highly available, transparently scalable, shared storage appliances. The system moves storage services, including storage processing, into the server layer to deliver low-latency I/O and more predictable storage performance.

Cisco UCS C240 M3 Rack Server Benchmark Results

Cisco achieved a VMmark 2.5 benchmark score of 12.00@10 tiles, reclaiming its number-one position as the best 2-socket server in a 2-node configuration by outperforming solutions from AMD, Dell, Fujitsu, and HP (Figure 2).

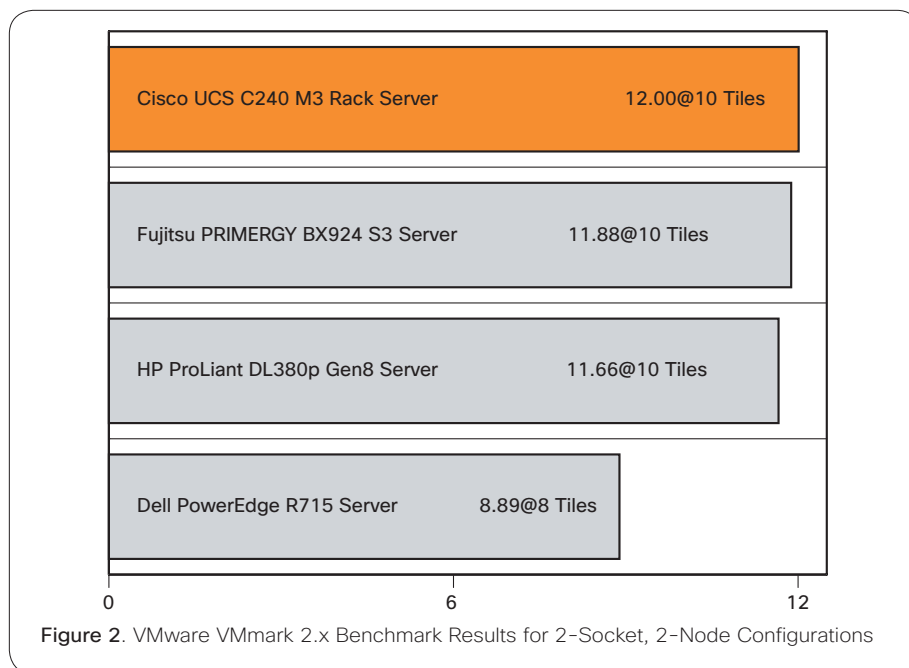


Figure 2. VMware VMmark 2.x Benchmark Results for 2-Socket, 2-Node Configurations

Conclusion

Better infrastructure yields better performance, and Cisco's world-record-setting VMware VMmark 2.5 benchmark results demonstrate how important infrastructure choices are for virtualized data center and cloud computing environments. With innovations such as unified fabrics, large memory capacity, expansion capabilities, and the low-latency performance of Fusion-io ioMemory and ION Data Accelerator software, Cisco's results demonstrate the architectural advantages of a system built for virtualized environments.

For More Information

For more information about the Cisco Unified Computing System, visit <http://www.cisco.com/go/ucs>.

For more information about Fusion-io flash memory systems, visit <http://www.fusionio.com>.

Disclosure

VMware VMmark is a product of VMware, Inc. The comparative results cited in this document were available at <http://www.vmware.com/a/assets/vmmark/pdf/2013-05-09-Cisco-C240M3.pdf> and were valid as of May 9, 2013.



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