



Cisco UCS B250 M2 Extended Memory Blade Server: Best Virtualization Performance of Any Blade Server Anywhere

Performance Brief

The Cisco® UCS B250 M2 Extended Memory Blade Server is a two-socket server that leads the industry with a VMware VMmark benchmark score of 35.83, making it the highest-performing blade server for virtualization available anywhere. This **43 percent advantage** over the closest server score means that customers can enjoy higher consolidation ratios in their virtualized environments with greater performance. The result is greater return on investment (ROI), reduced total cost of ownership (TCO), and a more agile business that can deploy applications more rapidly and securely.

A Platform Built for Virtualization

Virtualization has accelerated the need for a comprehensive solution that integrates application, platform, network, and infrastructure virtualization. Cisco and VMware, the respective industry leaders in data center infrastructure and virtualization, have teamed up to deliver optimized and integrated virtualization solutions. The Cisco Unified Computing System™, in combination with VMware vSphere software, enables customers to achieve a best-in-class virtual data center for mission-critical business functions.

While every vendor has access to the latest, high-performance CPUs, only Cisco combines them into a platform that was built with exceptional support for virtualized environments. The Cisco Unified Computing System is a next-generation data center platform that unites compute, network, storage access, and virtualization into a cohesive system designed to reduce TCO and increase business agility. While other vendors can offer servers that also use the best and fastest CPUs available today, Cisco delivers more performance from the entire system, and the latest VMware VMmark benchmark results are proof.

VMware VMmark Benchmark

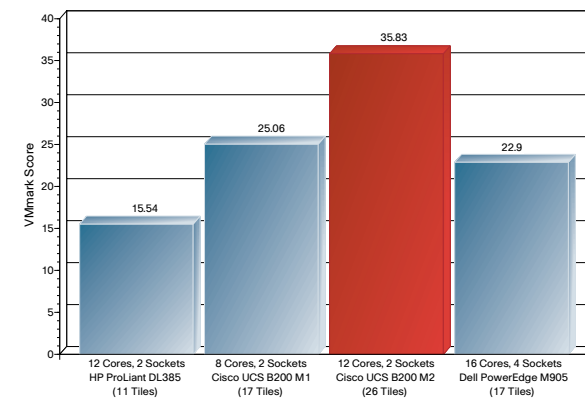
Conventional application benchmarks measure the performance of a single application running on a single operating system instance. Recognizing that virtualized environments run multiple applications and OS instances simultaneously, VMware developed the VMmark benchmark to give vendors a tool for comparing performance in virtualized environments.

VMware VMmark incorporates six benchmarks, including email, web, database, and file server workloads, into a tile. A tile represents a diverse, virtualized workload, and vendors increase the number of tiles running on a system under test until a peak level of performance is observed. This procedure produces a VMware VMmark score and the number of tiles for the benchmark run.

Industry-Leading Performance

Cisco tested the Cisco Unified Computing System equipped with a Cisco UCS B250 M2 server containing two six-core Intel Xeon X5680 processors with 192 GB of memory connected to an EMC CLARiiON CX4-240 storage system whose performance was optimized with a combination of solid-state drives and 15,000 RPM disk drives. This two-socket, 12-core system delivered a VMware VMmark score surpassing all blade server results posted at www.vmmark.com as of March 12, 2010, regardless of whether the system had 8, 12, or even 16 cores (Figure 1). The VMware VMmark score of 35.83 is 43 percent higher than the next-closest server result, the Cisco UCS B200 M1 Blade Server with two quad-core Intel Xeon 5500 series processors. The latest result was achieved while running 26 tiles, or a total of 156 virtual machines on a single two-socket server, giving customers an indication of the virtual machine density that can be achieved on the Cisco Unified Computing System.

Figure 1 The Cisco UCS B250 M2 Server Delivers the Highest VMware VMmark Benchmark Performance of Any Blade Server with Any Number of Cores.



Architecture Delivers Virtualization Performance

The astonishing performance of the Cisco UCS B250 M2 Server is no accident. It is the direct result of the virtualization optimization incorporated into the Cisco Unified Computing System.

Intel Xeon 5600 Series Processors:

- The raw compute power is delivered by Intel Xeon 5600 Series processors that are designed to adjust performance to workload demands, make more efficient use of power, and provide hardware-assisted support for virtualized environments.



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10-Gbps Unified Fabric:

- The Cisco Unified Computing System is designed around a 10-Gbps unified fabric that carries both IP and Fibre Channel over Ethernet (FCoE) traffic over the same link, eliminating the cost and complexity of purchasing, cabling, maintaining, powering, and cooling multiple parallel networks within server racks. For the VMware VMmark benchmark run, the unified fabric carried FCoE traffic to the system's fabric interconnects, where native Fibre Channel connected the system through a SAN to the EMC CLARiiON storage system. The outstanding benchmark results give further proof of the capability of the unified fabric to support even the most processor-intensive workloads.

Cisco Extended Memory Technology:

- With the latest generation of processors from Intel, memory, not CPU, is even more likely than before to be the bottleneck for virtualized workloads, placing a new emphasis on the importance of cost-effective memory scalability. The Cisco UCS B250 M2 server supports 48 DIMM slots that can be configured to deliver up to 384 GB of main memory using 8-GB DIMMs or up to 192 GB of main memory using lower-cost 4-GB DIMMs. The superior benchmark results demonstrate the importance of cost-effective memory footprints for virtualized environments and show customers how Cisco's patented technology can help increase consolidation ratios and further reduce capital and operating costs while also reducing the number of servers and licenses that need to be managed.

Cisco UCS M81KR Virtual Interface Card:

- Traditional virtualized environments increase complexity through the proliferation of network management points and the inability to manage network quality of service (QoS) on a per-virtual machine basis. Cisco VN-Link technology overcomes these challenges by establishing management visibility into each virtual machine's network links, allowing both QoS and security to be managed for virtual links just as they are for physical links.

The Cisco M81KR Virtual Interface Card (VIC) delivers a hardware implementation of Cisco VN-Link technology that makes up to 128 virtual devices available directly to virtual machines. When combined with VMware VMDirectPath technology, virtualized applications can deliver up to **30 percent more network throughput** by allowing virtual machines to interface directly with the card's devices, bypassing the hypervisor entirely.

To deliver a VMware VMmark score of 35.83, the blade server's VIC was configured with two host bus adapters (HBAs) for Fibre Channel connectivity to the hypervisor, a number of network interface cards (NICs) to support VMware's requirement for VMkernel and virtual machine console network connectivity, and other NICs

to support virtual machine traffic. Of all the workloads contained in a tile, the web server workload was the most network intensive, so each of the 26 web servers (one per tile) was provided with a dedicated NIC that it could access through the hypervisor, isolating web server traffic and allowing it to be managed independently. With Cisco VN-Link used in hardware, the hypervisor virtual switch (vSwitch) was not used by web servers, freeing CPU cycles for greater application performance.

Conclusion

The Cisco Unified Computing System featuring the Cisco UCS B250 blade server has achieved a new level of virtualization performance and capacity. Besting its own benchmark by 43 percent, Cisco delivers the best blade server performance available from any x86-architecture server vendor while delivering real savings in the form of lower capital expenditures and lower licensing, management, power, cooling, and other operational costs.

This breakthrough in performance and scalability brings virtualization scalability, availability, and ease of management firmly into the mainstream two-socket server market. Organizations of all sizes can now achieve the economic benefits of outstanding ROI and reduced TCO while maintaining the agility to continuously adapt and give their businesses the competitive edge they need.

For More Information

For more information about the Cisco UCS B250 M2 server, visit <http://www.cisco.com/en/US/products/ps10914/index.html>.

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

Benchmark Disclosures

VMware® VMmark™ is a product of VMware, Inc. VMmark utilizes SPECjbb2005® and SPECweb2005®, which are available from the Standard Performance Evaluation Corporation (SPEC). SPEC and the benchmark names SPECjbb and SPECweb are registered trademarks of the Standard Performance Evaluation Corporation.

Cisco UCS B250 M2 server score of 35.83 with 26 tiles was made available at www.vmmark.com on March 16, 2010. All other results were obtained from www.vmmark.com as of March 15, 2010: Cisco UCS B200 M1 server result of 25.06 with 17 tiles reported January 12, 2010; HP ProLiant DL385 G6 Server result of 15.54 with 11 tiles reported June 2, 2009; and Dell PowerEdge M905 Server result of 22.90 with 17 tiles reported June 19, 2009.