



# Cisco UCS B440 M1 High-Performance Blade Server: World-Record Virtualization Performance

Performance Brief

## World-Record-Setting Blade Server Performance

The Cisco® UCS B440 M1 High-Performance Blade Server is a four-socket server that leads the blade industry with a **VMware VMmark benchmark score of 71.13 at 48 tiles**, making it the highest-performing blade server for virtualization available anywhere. The server **more than doubles HP's closest blade server result** and delivers an **22 percent advantage over the closest blade server score**. This result means that customers can achieve higher consolidation ratios in their virtualized environments, with greater performance. Customers now can run even the most challenging workloads on a blade system with greater return on investment (ROI), reduced total cost of ownership (TCO), and the agility to 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.

Although While every vendor has access to the latest, high-performance CPUs, only Cisco combines them into a platform 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 resources 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.

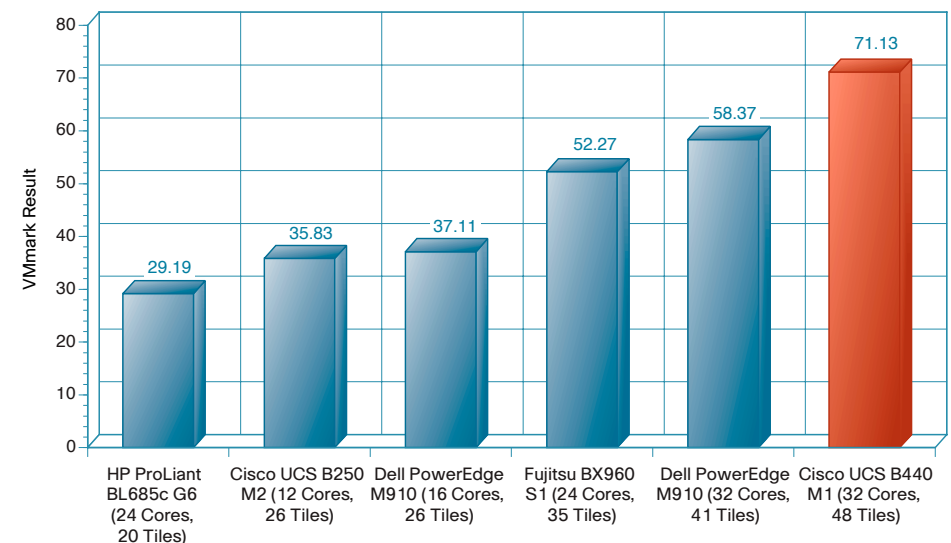
VMware VMmark incorporates six benchmarks, including email, web, database, and file server workloads, into a *tile*. A tile represents a diverse, virtualized workload, and vendors increase the number of tiles running on a system under test until a peak level of

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 B440 M1 blade server containing four eight-core Intel Xeon X7500 series processors with 512 GB of memory connected to two EMC CLARiiON CX4-480 storage systems through a Fibre Channel SAN. This four-socket, 32-core system delivers a VMware VMmark score surpassing all blade server results posted at <http://www.vmmark.com> as of August 25, 2010 (Figure 1). The VMware VMmark score of 71.13 is 243 percent higher than HP's next-closest blade server result. It is 22 percent higher than the next-closest blade server result, the Dell PowerEdge M910 Blade Server with four eight-core Intel Xeon 7500 series processors. The latest result was achieved while running 48 tiles, or a total of 288 virtual machines on a single four-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 B440 M1 Server Delivers the Highest VMware VMmark Benchmark Performance of Any Blade Server with Any Number of Cores.





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## Architecture Delivers Virtualization Performance

The astonishing performance of the Cisco UCS B440 M1 Server is no accident. It is the direct result of the virtualization optimization incorporated into the Cisco Unified Computing System.

## Intel Xeon 7500 Series Processors

The raw computing power of Intel Xeon 7500 series processors delivers the biggest performance leap ever for Intel Xeon processors, giving customers scalable performance, higher virtual machine densities, and investment protection with flexible virtualization and advanced reliability.

## 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 systems. The outstanding benchmark results are further proof of the capability of the unified fabric to support even the most processor-intensive workloads.

## Cisco UCS M81KR Virtual Interface Card (VIC)

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 meets 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 VIC delivers a hardware implementation of Cisco VN-Link technology that makes up to 128 virtual devices available directly to virtual machines. When the Cisco M81KR is 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 71.13, the blade server's two VICs were configured with two virtual host bus adapters (HBAs) for Fibre Channel connectivity to the hypervisor, several virtual network interface cards (vNICs) to support VMware's requirement for vmkernel and virtual machine console network connectivity, and other vNICs to support virtual machine traffic. Of all the workloads contained in a tile, the web server workload is the most network intensive, so each of the 48 web servers (one per tile) was provided with a dedicated vNIC that it could access through the hypervisor, isolating web server

traffic and allowing it to be managed independently. With Cisco VN-Link in hardware, web servers did not use the hypervisor virtual switch (vSwitch), freeing CPU cycles for greater application performance.

## Conclusion

The Cisco Unified Computing System featuring the Cisco UCS B440 blade server has achieved a new level of virtualization performance and capacity. Cisco delivers the best blade server performance available from any x86-architecture blade server vendor while delivering real savings in the form of lower capital expenditures and lower licensing, management, power, cooling, and other operating costs.

This breakthrough in performance brings virtualization scalability, availability, and ease of management firmly into the mainstream four-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 B440 M1 server, visit <http://www.cisco.com/en/US/products/ps10921/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.

The Cisco UCS B440 M1 server score of 71.13 with 48 tiles was made available at [www.vmmark.com](http://www.vmmark.com) on July 27, 2010. All other results were obtained from [www.vmmark.com](http://www.vmmark.com) as of August 25, 2010: Dell PowerEdge M910 (32 cores) server result of 58.37 with 41 tiles reported August 24, 2010; Fujitsu BX960 S1 server result of 52.27 with 35 tiles reported June 29, 2010; Dell PowerEdge M910 (16 cores) server result of 37.11 with 26 tiles reported July 13, 2010; Cisco UCS B250 M2 server result of 35.83 with 26 tiles reported April 6, 2010; and HP ProLiant BL685c G6 server result of 29.19 with 20 tiles reported July 14, 2009.