Brochure

Business Advantage Delivered:

The Cisco Unified Computing System

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Today more than ever, business organizations recognize that their competitive advantage depends on the ability to be more flexible, agile, and cost effective than their competitors.

One way that IT organizations are improving operational efficiency is to view their data centers as a fully integrated compute system, rather than individual server, network, and storage components. This approach has prompted a move away from the manual assembly of individual components and toward deployment of more unified systems. Truly unified systems go beyond convergence, delivering the benefits of centralized computing to today's modern data center.

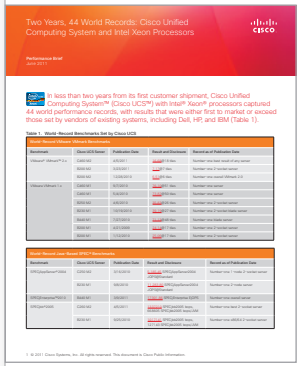
This holistic approach addresses the top concerns of senior executives and IT managers, enabling them to harness the power of their infrastructure at a moment's notice and respond quickly to the demands of an ever-changing marketplace. These concerns include:

- Management complexity
- Capacity planning, system refresh, and integration
- Delivering application performance
- Management of virtualized environments
- Lifecycle management
- Server sprawl and environmental factors

Traditional blade servers and virtualization have provided solutions to some of these concerns, but they have also created new problems. With an innovative and proven design, Cisco Unified Computing System™ (Cisco UCS™) delivers an architecture that increases cost efficiency, agility, and flexibility beyond what traditional blade and rack-mount servers provide. Cisco makes organizations more effective by addressing the real problems that IT managers and executives face and solves them on a systemic level. Cisco provides solutions to these industry problems without compromising performance. Since Cisco UCS was introduced, Cisco has set more than 50 world performance records with multiple servers based on multiple generations of Intel® Xeon® processors.

Business Performance Advantage

Cisco Unified Computing System is designed to deliver the performance and efficiency required by today's businesses. Powered by Intel® Xeon® processors, Cisco has delivered consistent, world-record-setting performance for more than two years, demonstrating Cisco and Intel's commitment to excellence. Setting more than 40 world records illustrates just how well Cisco UCS makes the raw power of Intel Xeon processors available for better application performance.


Two Years, 44 World Records: Cisco Unified Computing System and Intel Xeon Processors

Performance Brief

In less than two years from its first customer shipment, Cisco Unified Computing System™ (Cisco UCS™) with Intel® Xeon® processors captured 44 world performance records, with results that were either first to market or exceed those set by vendors of existing systems, including Dell, HP, and IBM (Table 1).

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Business Advantage Delivered: Easier IT Management

Cisco UCS is dynamically scalable, smart infrastructure. It is configured through unified, model-based management to simplify and speed deployment of enterprise-class applications and services running in monolithic, virtualized, and cloud-computing environments. Using the latest Intel Xeon Processor E7 family, the system combines servers with networking and storage access into a single converged system that delivers greater cost efficiency and agility with increased performance, visibility, and control.

Increase Management Efficiency

Company	Cost and Time Savings
MediaPro	50% faster to deploy and provision compared to traditional servers
Molina Healthcare	33% reduction in time to deploy new applications
Moses Cone	96 hours saved on server configuration
NetApp	10,000 virtual machines deployed in less than 1 hour
Nighthawk Radiology	15 to 20 minutes to provision servers
Slumberland	74% reduction in time to provision servers
Tele Sistemi Ferroviari	25% savings in new server provisioning costs
Klinikum Wels-Grieskirchen	80% reduction in management consoles (6:1) for network, applications, and servers
NetApp	99% reduction in management points (204 to 2)

Easier IT Management

Too many tools and too many steps to accomplish routine administrative tasks increases costs. More important, this complexity imposes time-to-market opportunity cost.

Cisco UCS enables IT organizations to be more effective by reducing the time spent on tactical, operational activities. Greater time-on-task efficiency leaves more time to focus on making the businesses successful and more competitive in the marketplace. Cisco UCS does this by bringing together both blade and rack-mount servers in a converged system that is self-aware and self-integrating. Cisco UCS automatically discovers, inventories, and configures components, making their power ready to be harnessed quickly and efficiently.

Greater Time-on-Task Efficiency

Automated configuration can change an IT organization's approach from reactive to proactive. The result is more time for innovation, less time spent on maintenance, and faster response times. These efficiencies allow IT staff more

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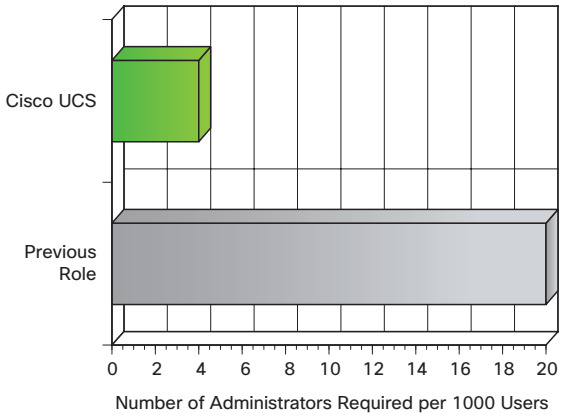
Business Advantage Delivered: Easier IT Management

Make Administrators Five Times More Efficient

"At my previous company, we needed 20 IT personnel for 1000 employees. With Cisco UCS, ExamWorks can support the same number of people with a staff of four. Avoiding the need for 16 full-time positions saves more than US$1.1 million annually."

Brian Denton,
Chief Technology Officer,
ExamWorks, Inc.



http://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps9670/case_study_c36-580410.pdf

time to address strategic business initiatives. They also enable better quality of life for IT staff, which means higher morale and better staff retention–both critical elements for long-term efficiency.

Cisco UCS Manager is an embedded, model-based management system that allows IT administrators to set a vast range of server configuration policies, from firmware and BIOS settings to network and storage connectivity. Individual servers can be deployed in less time and with fewer steps than in traditional environments. Automation frees staff from tedious, repetitive, time-consuming chores that are often the source of errors that cause downtime, making the entire data center more cost effective.

Easier Scaling

Automation means rapid deployment, reduced opportunity cost, and better capital resource utilization. With Cisco UCS, rack-mount and blade servers can move from the loading dock and into production in a "plug-and-play" operation. Automatically configure blade servers using predefined policies simply by inserting the devices into an open blade chassis slot. Integrate rack-mount servers by connecting them to top-of-rack Cisco Nexus® fabric extenders. Since policies make configuration automated and repeatable, configuring 100 new servers is as straightforward as configuring one server, delivering agile, cost-effective scaling.

Virtual Blade Chassis

With a separate network and separate management for each chassis, traditional blade systems are functionally an accidental architecture based on an approach that compresses all the components of a rack into each and every chassis. Such traditional blade systems are managed with multiple management tools that are combined to give the illusion of convergence for what is ultimately a more labor-intensive, error-prone and costly delivery methodology. Rack-mount servers are not integrated and must be managed either separately or through additional tool sets, adding complexity, overhead, and the burden of more time.

Architecturally, Cisco UCS blade and rack-mount servers are joined into a single virtual blade chassis that is centrally managed yet physically distributed across multiple blade chassis, rack-mount servers, and even racks and rows. This capability is delivered through Cisco® fabric interconnects that provide redundant connectivity, a common management and networking interface, and enhanced flexibility. This larger virtual chassis, with a single redundant point of management, results in lower infrastructure cost per server, with fewer management touch points, and lower administration, capital, and operational costs.

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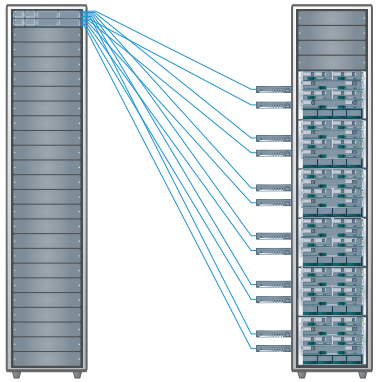
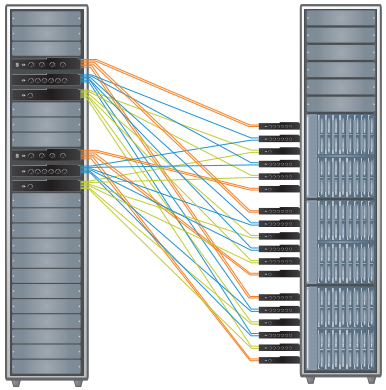
Business Advantage Delivered: Easy System Refresh

Simplify Infrastructure and Reduce Cost

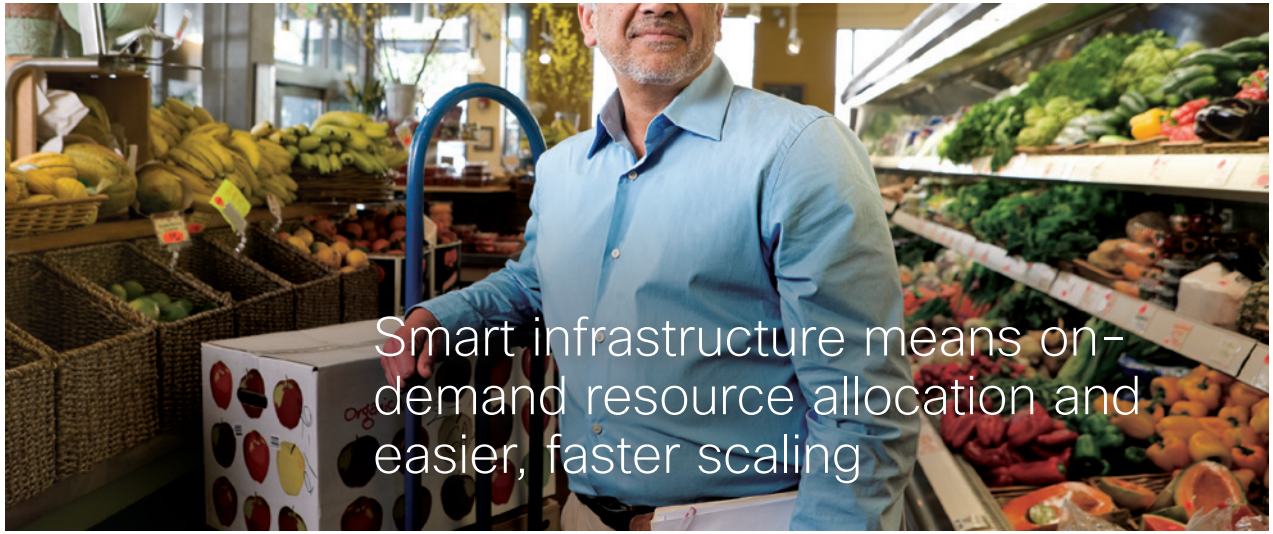
The number of components and management points correlates directly with operating costs. Cisco UCS reduces the number of components, cables, and management points, reducing costs.



Fewer Components and Cables with Cisco Unified Computing System



More Components and Cables for Traditional Rack-Mount and Blade Servers



Easy System Refresh and Capacity Planning Operations

Application silos thwart any attempt to uniformly manage cost and capacity in a logical and coherent manner. Even refreshing server infrastructure is tedious and error prone when attempted in siloed architectures.

Application silos were in the past thought to be a good idea. They have failed in execution because they are overprovisioned by necessity, they impede resource sharing, and they limit flexibility and agility. All of this reduces a data center's efficiency and cost effectiveness. Cisco UCS eliminates silos by simplifying provisioning, facilitating sharing, and increasing flexibility by making any server ready to tackle any application workload in minutes.

Breaking Down Silos

Cisco UCS is smart infrastructure that is designed to eliminate the walls between compute silos and run any workload on any server. The system is designed as a flexible pool of compute, network, and storage access resources that can be allocated (and reallocated) to workloads on a just-in-time basis. This approach enhances an organization's ability to respond to changing business requirements, while allowing capacity to be managed on a strategic, organizationwide basis.

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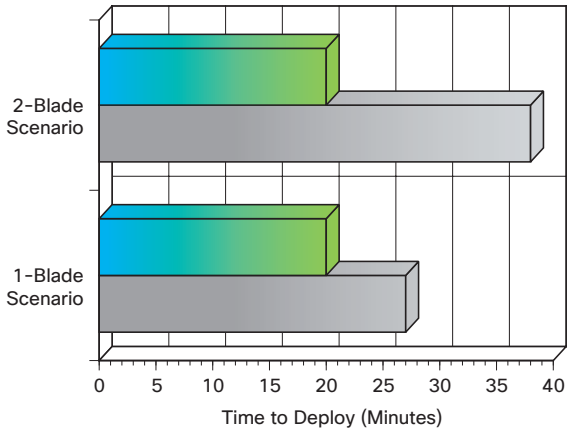
Business Advantage Delivered: Easy Capacity Planning

Deploy in Half the Time with Nearly 70 Percent Fewer Steps

Cisco UCS B250 M2 Extended Memory Blade Servers can be integrated in nearly half the time it takes to add HP c-Class blade servers with HP Virtual Connect with 67 percent fewer steps, taking advantage of the largely automated process (see http://www.youtube.com/watch?v=nijWlNzSgCQ).



Principled Technologies, March 2011 (http://principledtechnologies.com/clients/reports/Cisco/UCS_vs_HP_Deployment.pdf)

On-Demand Resource Allocation

Lack of automation lengthens the time to production for new resources. Manually implementing server and network configuration policies adds operational drag that can be quantified in terms of opportunity cost and missed market windows.

With Cisco UCS, every detail of a server's configuration and its network connectivity are encapsulated in a Cisco service profile. Applying a service profile to a server configures it to a known state that complies with predefined organizational standards. Cisco service profiles make migration of workloads between servers with different capacities straightforward, while simplifying server refresh by speeding the movement of existing workloads from older servers to Cisco UCS. Spare capacity can be maintained in a pool shared by all applications and allocated on demand, reducing the cost of burst capacity and disaster-recovery resources, making the data center more agile.

Lower Cost of Scale

Cisco UCS scales incrementally with optimized density and at lower cost than traditional blade server architectures.

With Cisco UCS, scaling is more graceful and cost effective because the addition of the next blade server chassis does not require installation of tens of thousands of dollars of new network and management infrastructure in the back of each chassis. Each increment of scale brings greater performance due to the proven performance of the system's core processing capability, powered by processors such as the Intel Xeon processor E7 family.

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Business Advantage Delivered: Performance Without Compromise

Lower Cost to Scale

Cisco UCS delivers scalability of large configurations for up to 52 percent less cost, all managed with a single management interface.

Blade Count	32	48	64
Traditional Blade Costs	$115,484	$173,226	$230,968
Cisco UCS 5108 Costs	$115,144	$135,591	$156,038
Cisco UCS Savings	$340	$37,635	$74,930
Cisco UCS % Savings	0%	22%	32%

Blade Count	96	128	160
Traditional Blade Costs	$288,710	$461,936	$577,420
Cisco UCS 5108 Costs	$196,931	$237,825	$278,719
Cisco UCS Savings	$149,521	$224,111	$298,701
Cisco UCS % Savings	43%	49%	52%

Note: Costs in U.S. dollars. Based on Cisco UCS manufacturer's suggested retail price (MSRP) June 28, 2011; HP retail July 2, 2011

Performance Without Compromise

Easily matching performance to business initiatives is an essential IT function that makes the difference between IT as a strategic partner in the business and IT as a cost center.

Real performance is delivery of solutions that meet business needs. Cisco UCS delivers on all three critical data center metrics: essential raw computing power, an architecture that promotes solution performance, and holistic management efficiency, making IT organizations increasingly more agile, flexible, and cost effective.

Cisco UCS servers provide an environment that unleashes the power of Intel Xeon processors, setting world records on a broad range of industry benchmarks. Cisco UCS uses the latest Intel Xeon processors and delivers optimized performance for the most demanding, mission-critical workloads. These servers include a range of 2- and 4-socket models in both blade and rack-mount form factors, with processors having up to 10 cores per socket. Cisco UCS performance is due in part to the efficient, airflow design that allows Intel Turbo Boost technology to automatically raise processor clock rates without reaching thermal limits.

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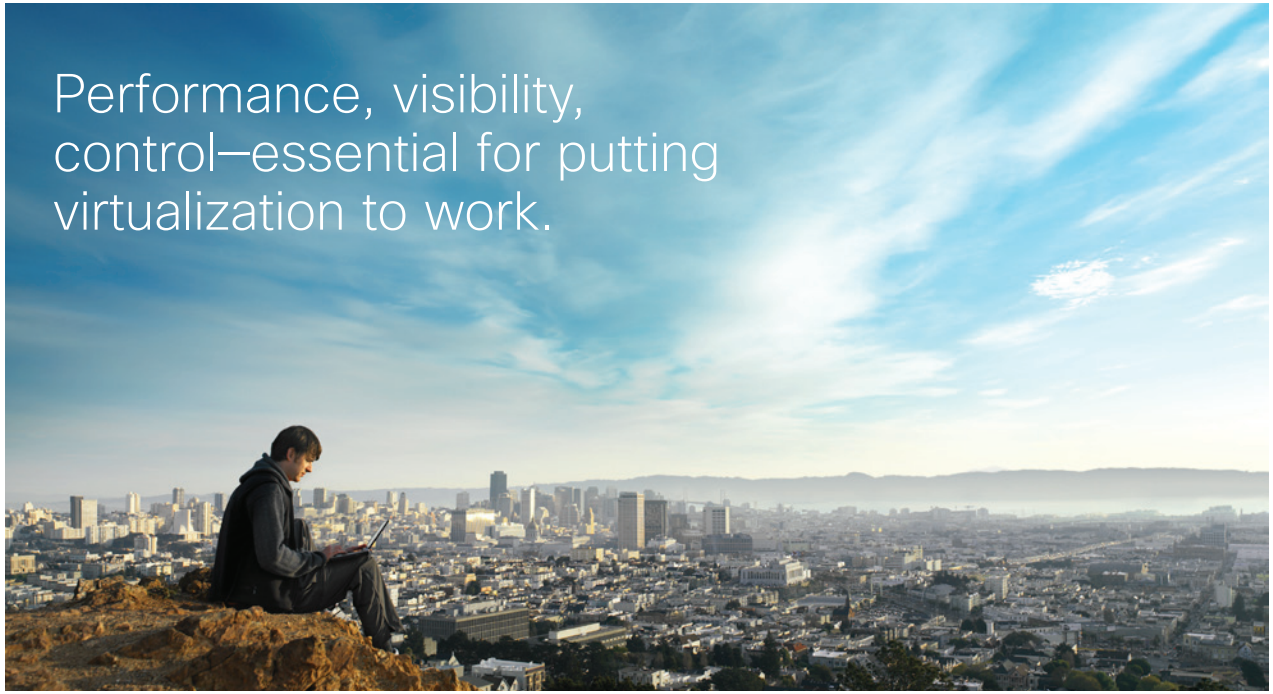
Business Advantage Delivered: High-Performance Virtualized Environments

Cisco UCS offers a full range of Intel Xeon processor–powered server models and an architecture that gives organizations the flexibility to easily size workloads to meet the needs of specific applications. This approach has led to record-setting benchmarks running mission-critical, enterprise-class applications on bare-metal servers, with workloads including Oracle E-Business Suite, Java application servers, and high-performance compute grids. This industry-leading performance enables organizations to move from servers based on costly, proprietary RISC processors to Cisco UCS servers using industry-standard x86-architecture servers for superior performance on business economics.

Get 20 Times Better Performance from Intel Xeon Processors

EMC's IT department moved one of the largest Oracle databases in the world from Sun SPARC processor-based servers to Cisco UCS powered by Intel Xeon processors. The migration resulted in up to 20 times greater performance and a 60 percent decrease in batch times and end-user response times with US$5 to 7 million in savings.

(http://www.emc.com/collateral/hardware/white-papers/h8170-emc-it-on-ramp-cloud-wp.pdf)



Manageable, High-Performance Virtualized Environments

The benefits of virtualization cannot be fully achieved as long as the task of managing virtual infrastructure and getting it to perform well is an art and not a science.

Virtualization and blade servers have incrementally improved the fundamentals of cost, flexibility, and agility in data centers, while creating new problems for IT organizations: managing rapidly growing virtualized environments and achieving optimal performance under load. Virtual machines are easy to create, but in traditional environments they can be lost among multiple layers of management complexity. This complexity obscures performance problems and makes management an ever-increasing challenge. Cisco UCS is a virtualization-optimized platform that dramatically improves the cost equation while simplifying management and delivering performance under load, dramatically improving agility and response times.

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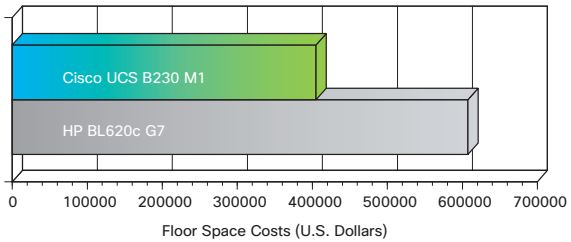
Business Advantage Delivered: More Performance, Less Space

Reduce Footprint by One Third

With a 160-blade configuration, Cisco UCS provides a 33 percent cost savings, amounting to savings of US$202,500 for data center floor space compared to competitors.



Cisco UCS B230 M1 vs HP BL620 G7, based on information gathered from cisco.com and hp.com, March 2011. This chart assumes a data center cost of US$2500 per square foot.

More Performance in Less Space

In addition to offering outstanding monolithic application performance, Cisco UCS is optimized for virtualization. Proving this fact is two years of performance records on the VMware VMmark 1.0 and 2.0 benchmarks that measure virtualization and cloud-computing performance. Cisco UCS packs tremendous computing power, memory, network, and I/O bandwidth into a given space while boosting performance of virtualized environments. Cisco virtual interface cards using Intel VT-d technology improve network throughput by up to 38 percent while freeing CPU cycles to deliver greater application performance.

Cisco blade server chassis can support up to 80 Gbps of I/O bandwidth per half-width blade, 160 Gbps for a full-width blade, and with support for an aggregate 160 Gbps of bandwidth in a single eight-blade chassis.

Data center real estate costs are substantial, whether expressed as the opportunity cost for an organization to maintain its own data center or as the footprint occupied at a co-location facility. Working within an existing data center space means making smart server purchases that increase the capability to meet business objectives without forcing a costly data center expansion.

Cisco UCS changes the cost equation by supporting ever-increasing guest operating system memory footprints with a smaller number of servers. Cisco's high density, high-performance design, including Cisco Extended Memory Technology, increases consolidation ratios for two-socket servers while saving the capital, operating, real estate, and licensing costs of running virtualization software on larger, four-socket servers. This technology optimizes the costs to deliver virtual machine compute capacity and is particularly effective at increasing return on investment (ROI) for virtual desktop environments and for single-application-instance servers that require large memory footprints.

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Business Advantage Delivered: Increased Visibility and Control

Gain More Memory and Deliver Higher Performance

Cisco Extended Memory Technology delivers up to 27 percent faster memory access speeds with high memory density that also saves up to 24 percent of memory cost. With support for up to 1 terabyte (TB) of memory in a two-socket server, organizations can host applications using less-expensive servers without losing performance. Additionally, per-socket-based software licensing costs are reduced when using a two-socket server compared to a four-socket server.

Memory Capacity (GB)	Typical System Memory Costs	Cisco UCS Costs	Cost Savings	Savings (Percent)
96	$4,278	$4,086	$192	4%
144	$6,952	$6,129	$824	12%
192	$10,698	$8,172	$2,526	24%
512	$28,528	$22,816	$5,712	20%
1024	$64,551	$57,056	$7,495	12%

Note: Costs in U.S. dollars

Cisco UCS: A Real-World TCO Analysis, Enterprise Management Associates, April 2011. (http://www.enterprisemanagement.com/research/asset.php/1976/Cisco-UCS:-A-Real-World-TCO-Analysis)

Increased Visibility and Control

Increased performance and consolidation ratios alone do not solve the management problems that arise in virtualized environments. IT administrators and managers must be able to see and control their computing environment, whether physical or virtual. Making virtual machines equivalent to physical servers and tightly integrating with leading hypervisors is required for this level of insight. Cisco's approach results in lower operating costs, increased security, and less chance of errors that can cause application downtime. The result is increased visibility and control over virtualized environments, deterministic network performance regardless of physical location, improved network throughput, more flexibility to manage workloads, and increased compliance with security requirements.

Cisco fabric extender technology brings the visibility and control of physical servers to the scale of virtual environments. By directly connecting fabric interconnect ports to both physical servers and virtual machines, virtual machine network traffic becomes completely transparent, secure, and under administrator control.

Intel FlexMigration technology increases virtual machine mobility across multiple generations of processors. Cisco virtual interface cards, in conjunction with Cisco Virtual Machine Fabric Extender (VM-FEX) technology, connect network interface cards (NICs) to virtual machines, maintaining network policies across virtual machine migration and improving performance by eliminating the overhead of software switching. The result is a more agile, flexible, and cost-effective computing environment.

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Business Advantage Delivered: Complete Lifecycle Management

Quickly Migrate IT Assets

"We found we could quickly convert physical servers from acquired companies and turn them into virtual machines running on Cisco UCS."

Brian Denton,
Chief Technology Officer,
ExamWorks, Inc.

(http://www.cisco.com/en/US/prod/collateral/switches/ps9441/ps9670/case_study_c36-580410.pdf)

Rapidly Provision Virtual Machines

Euronet Worldwide, an industry leader and provider of highly secure electronic financial transaction solutions, deployed Cisco UCS and reduced the time needed for virtual server implementation and provisioning by up to 95 percent compared to the time needed for its former infrastructure. The new implementation has resulted in decreased power consumption, cooling needs, and rack space.

(http://www.marketwire.com/press-release/euronet-deploys-cisco-unified-computing-system-and-cloud-infrastructure-nasdaq-csco-1507480.htm)

Complete Lifecycle Management

Traditional lifecycle management can make each server a static resource dedicated to a single task for life, limiting organizational agility and reducing the flexibility of capital utilization.

Cisco UCS uses servers as dynamic resources that can be applied to meet any workload challenge at any time, quickly and effectively. Now organizations can extend their server lifecycles by redeploying them for less mission-critical tasks as the newest generation of servers is phased in to provide the latest and best performance where it matters most. Cisco UCS makes this possible through automated, repeatable, and error-free asset deployment that enhances the cost benefit of every server.

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Business Advantage Delivered: Complete Lifecycle Management

Simplify Management

"[Cisco] UCS Manager is truly the UCS 'secret sauce,' providing a single management point and plane for managing all UCS resources, both server and networking, as well as storage connectivity. This capability dramatically increases the flexibility and agility that data center personnel need to respond real-time to changing business needs. For UCS servers, this management functionality is agentless, eliminating the maintenance burden required by other solutions to keep multiple firmware versions in sync to ensure operability. "

Cisco UCS: A Real-World TCO Analysis, Enterprise Management Associates, April 2011. (http://www.enterprisemanagement.com/research/asset.php/1976/Cisco-UCS:-A-Real-World-TCO-Analysis)

Automated Firmware Management

Cisco service profiles configure complete systems, from firmware revisions and BIOS settings to network profiles, with click-of-the-mouse simplicity. Configuration complexity used to limit servers to a single function, but now they can serve one purpose by day and a different purpose by night; administrators simply assign service profiles and let the system's automated configuration do the rest.

Rapid Deployment with Increased Compliance

The system's unified management configures servers with fewer steps, in less time, and without the chance of error due to misconfiguration. IT policy consistency and compliance, regardless of location, is essentially guaranteed. By grouping compute resources into pools, administrators know immediately which servers are available and best match application workload requirements. They can deploy these servers easily in a safe, repeatable, agile, and cost-effective way.

Support for Existing Organizational Structures

Time lags between various stages of server production enablement can have serious consequences and add significant cost. Cisco service profile templates (supported by Cisco UCS Manager) support existing organizational structures by combining role-based access with policy-based management within a single unified management tool, rather than aggregations of legacy element managers. This approach increases operational efficiency and speeds time to production. This benefit does more than increase capital utilization; it significantly reduces the opportunity cost of long deployment times, helping an organization become more cost effective and therefore more competitive.

Integration with Data Center Best Practices

Cisco UCS merges smoothly into the overall data center ecosystem. More than 40 partners have integrated their tools through the system's open XML API to support high-level management, provisioning, and orchestration functions. IT organizations implementing ITIL processes can use the API to populate a configuration management database (CMDB) automatically, eliminating the most difficult barrier to adopting ITIL processes: human error.

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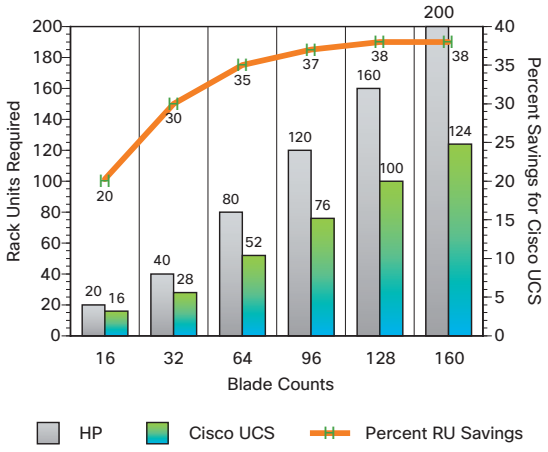
Business Advantage Delivered: Improved Environmental Factors

Deploy More Servers in Less Space with Lower Cost

Consolidating more servers into a smaller footprint increases data center computing power per square foot to bring savings. The Cisco UCS infrastructure requires 37 percent less space and supports 60 percent more servers per rack unit, resulting in a 33 percent cost savings over competitors.



Cisco UCS B230 M1 vs HP BL620 G7, based on information gathered from cisco.com and hp.com, March 2011. This chart assumes a data center cost of US$2500 per square foot.

Reduced Sprawl and Improved Environmental Factors

Every data center faces the challenge of deploying more applications to serve more users within the confines of existing space, power, and cooling resources.

Reduced server sprawl and improved environmental factors give IT organizations room to grow where there was none before. Improved data center space utilization, reduced square footage requirements, and greater business agility with built-in "room to grow" within an existing physical environment affect data center agility and cost efficiency.

Cisco UCS radically simplifies rack-level data center deployment. The system's unified fabric condenses up to three parallel networks into one, reducing the number of I/O interfaces, cables, and access-layer switch ports by up to a factor of three. Cisco technology also eliminates blade server– and hypervisor–based software switches, reducing capital and operating costs while freeing CPU cycles for better application performance.

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Business Advantage Delivered: The Cisco Unified Computing System

The system's simplified design reduces power and cooling requirements, extending the life of existing data centers while reducing a company's environmental impact. With fewer components, the system can help data centers increase density and reduce space costs. Fewer active components reduces power consumption. Fewer cables reduces the amount of copper in the data center while simplifying management and reducing the cost of installing and maintaining servers. The net result is a highly flexible and more cost-effective data center.

Cisco Unified Computing System Business Advantage

The business advantage of Cisco UCS derives from the system's simplified, converged architecture combined with its centralized management. Cisco UCS has fewer components to purchase, configure, manage, maintain, power, and cool, with more efficient scaling, resulting in total cost of ownership (TCO) savings across the entire data center. Cisco UCS Manager's unified management brings safe, repeatable automation to server configuration, increasing business agility, reducing the need for excess computing capacity, and promoting easy integration with high-level management tools. Cisco's approach to management preserves an organization's existing administrative role-based management structure while delivering enhanced collaboration. This approach enables IT staff to devote time to strategic initiatives that are critical to the business and that promote increased agility, flexibility, and cost effectiveness.

Moving to Cisco UCS is straightforward, accelerated by the system's automated configuration and the easy movement of applications from existing older platforms. The time has never been better for migration from more costly RISC processor–based platforms, and Cisco UCS can help at every stage, whether an organization is refreshing servers with traditional operating system and application stacks, consolidating and virtualizing, or adopting private cloud technology.

The Cisco UCS TCO advantage was designed into the product from the start and is unencumbered by the need to support existing product lines. Cisco UCS with Intel Xeon processors delivers an automated, adaptive data center that provides the critical components businesses need to be more flexible, agile, and cost effective in today's evolving marketplace.

Your Cisco sales representative can use Cisco's TCO tools to provide an objective comparison of your real cost of continuing to use traditional environments and your cost of moving to the first truly unified system available anywhere: Cisco Unified Computing System.

For More Information

Please visit http://www.cisco.com/go/ucs.

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